



**BRINK  
CONSTRUCTORS INC.,  
(BCI)  
HEALTH & SAFETY  
MANUAL**

# Table of Contents

## SECTIONS:

### INTRODUCTION PAGE

CONSTRUCTION SAFETY AND HEALTH MANAGEMENT SYSTEM 6

### POLICIES PAGE

COMPANY SAFETY POLICY 19

STOP WORK POLICY 22

DRUG AND ALCOHOL POLICY 23

### PROGRAMS PAGE

ACCIDENT AND INCIDENT REPORTING POLICY 28

AERIAL PERSONNEL LIFT PROGRAM 32

ASSURED EQUIPMENT GROUNDING AND/OR GFCI PROGRAM 35

AWAIR PROGRAM 37

BLOODBORNE PATHOGENS PROGRAM 51

CONFINED SPACE PROGRAM 57

CONSTRUCTIVE DISCIPLINARY PROGRAM 69

CRANE AND DERRICK SAFETY PROGRAM 71

ELECTRICAL SAFETY AWARENESS PROGRAM 81

FALL PROTECTION PROGRAM 86

FIRST AID PROGRAM 98

FORKLIFT SAFETY PROGRAM 101

GENERAL WASTE MANAGEMENT PROGRAM 104

HAND AND POWER TOOL SAFETY PROGRAM 106

HAZARD COMMUNICATION PROGRAM 109

HAZARD IDENTIFICATION AND RISK ASSESSMENT PROGRAM 130

HEARING CONSERVATION PROGRAM	134
LOCKOUT/TAG OUT PROGRAM	139
PERSONAL PROTECTIVE EQUIPMENT (PPE) PROGRAM	143
PROCESS SAFETY AWARENESS MANAGEMENT PROGRAM	148
SAFETY ASSURANCE PROGRAM	152
SCAFFOLDING SAFETY PROGRAM	156
TRENCHING AND EXCAVATING SAFETY PROGRAM	170
WELDING, CUTTING AND HOT WORK PROGRAM	174

<b>PLANS</b>	<b>PAGE</b>
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BENZENE AWARENESS PLAN/PROGRAM	184
FIRE SAFETY PLAN	191
HEAT ILLNESS – COLD EXPOSURE PREVENTION PLAN	194
HEXAVALENT CHROMIUM PLAN/PROGRAM	198
HYDROGEN SULFIDE PLAN/PROGRAM	206
LADDER SAFETY PLAN	209
LEAD AWARENESS PLAN/PROGRAM	215
NFPA 70E PLAN	219
RESPIRATORY PROTECTION PLAN/PROGRAM	226
RIGGING SELECTION AND ANALYSIS & MATERIAL HANDLING PLAN	238
STRUCTURE ERECTION PROCEDURE	245
SUBCONTRACTOR MANAGEMENT PLAN	247
VEHICLE ACCIDENT REPORTING PROCEDURE	249

# Attachments

# Page

Attachment 1	Safety Orientation Handout	254
Attachment 2	New Employee Safety Orientation Check List	261
Attachment 3	Drug and Alcohol Manual Receipt	262
Attachment 4	Non-Injury Accident and Near Miss Report	263
Attachment 5	Personal Injury Report	265
Attachment 6	Accident Investigation Worksheet	267
Attachment 7	Supervisor Accident Investigation Report	269
Attachment 8	Aerial Lift Check List	270
Attachment 9	Job Hazard Analysis	271
Attachment 10	Safety Meeting Report	272
Attachment 11	Job Site Safety Inspection Check List	273
Attachment 12	Confined Space Permit	278
Attachment 13	US DOL Notice of Alleged Safety or Health Hazard	279
Attachment 14	Employee Safety Suggestion Form and Report of Unsafe Condition Form	281
Attachment 15	Notice of Safety Infraction	282
Attachment 16	Daily Crane Inspection Check List	284
Attachment 17	Limited Approach Boundary Table	286
Attachment 18	Forklift Operator's Daily Check List	287
Attachment 19	Harness and Lanyard Inspection Check List	289
Attachment 20	Hazard Communication Training Record	291
Attachment 21	Hearing Conservation Program Training Record	292
Attachment 22	Lock Out – Tag Out Form – Energy Control Procedure Form	293
Attachment 23	Lock Out – Tag Out Form – Lock Removal Procedure Form	294
Attachment 24	Lock Out – Tag Out Form – Annual Energy Isolation Form	295
Attachment 25	Personal Protective Equipment Issue Form	296
Attachment 26	Project Safety Check List	297
Attachment 27	Fire Hazard Tables (Rapid City Only)	298
Attachment 28	Heat Index and Wind Chill Charts	299
Attachment 29	Hydrogen Sulfide Handout	301
Attachment 30	Monthly Ladder Inspection Check List	302
Attachment 31	Hoisting Signals	303
Attachment 32	Sling Inspection Work Sheet	304
Attachment 33	Forged Shackle Chart	307
Attachment 34	Sling Information Handout	308
Attachment 35	Respirator Selection Handout	311

# Attachments

# Page

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Attachment 36	Respirator Protection Fit Test Chart	313
Attachment 37	Respirator Protection Requirement Handout	314
Attachment 38	Respirator Protection Cartridge Use and Duration Chart	315
Attachment 39	Supplied Air Equipment Check List	316
Attachment 40	Respirator Protection Hazard Evaluation Summary	317
Attachment 41	Sub-Contractor Qualification Score Card	318
Attachment 42	Qualification Letter – Aerial Lift	319
Attachment 43	Qualification Letter – Cranes	320
Attachment 44	Qualification Letter – Forklift	323
Attachment 45	Qualification Letter – Digger/Derrick	325

# CONSTRUCTION SAFETY & HEALTH MANAGEMENT SYSTEM

## SAFETY AND HEALTH POLICY STATEMENT

Brink Constructors, Inc. (BCI) believes that no job or no task is more important than worker health and safety.

If a job represents a potential safety or health threat, every effort will be made to plan a safe way to do the task.

Every procedure must be a safe procedure. Shortcuts in safe procedures by either foremen or workers will not be tolerated.

If a worker observes any unsafe condition, which may pose a potential threat to their health or safety, it is expected that employees will immediately correct the situation when feasible or inform management. Management has the responsibility to take adequate precautions, comply with OSHA standards, and assure the safety and health of employees.

If a job cannot be done safely it will not be done.

Management will provide visible ongoing commitment, resources, and leadership to assure the implementation of the SHMS. All employees will be provided equally high quality safety and health protection.

We acknowledge the importance of creating a positive safety culture through employee involvement and effective policies and procedures.

*(Signature on File)*

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*Signature of Owner/Chief Executive Officer/President*

## **SAFETY AND HEALTH OBJECTIVES**

BCI plans to achieve worker safety and health through the following:

- Designate a qualified safety person to coordinate the program.
- Plan for safety before each job and each new task, using a written Job Safety Analysis and Job Briefings as required by 29 CFR 1910.269 (c)
- Make regular job site safety inspections (Attachments 11) and conduct health monitoring.
- Follow all safe work procedures, rules and OSHA Performance Standards
- Provide Safety Meetings (Attachments 10) and on-going safety training.
- Enforce safety rules and use appropriate discipline.

Effective safety programs utilize a SHMS that incorporates the following five elements:

- Management commitment and planning,
- Employee involvement,
- Worksite analysis,
- Hazard prevention and control,
- Safety and health training.

## **DESIGNATED SAFETY OFFICERS**

The Safety Officers for BCI are designated to coordinate, implement, and administer the safety and health system. Responsibilities include:

- Understand potential job hazards and how to eliminate them.
- Conduct or assist with Job Safety Analysis and Job Briefings
- Assure compliance with OSHA General Industry and Construction safety and health performance standard requirements.
- Conduct regular job site safety and health inspections.
- Establish safety and health procedures.
- Coordinate regular safety and health training.
- Conduct or assist with Tool Box Talks or Five Minute Safety Talks.
- Maintain documentation of training, inspections, injuries and illnesses, and other safety records as required by 29 CFR 1904 and 29 CFR 1910.269 (a)
- Participate in accident investigations (Attachments 6 & 7) and implementation of corrective actions.
- Involve employees in the implementation of the SHMS.
- Create statistical reports that compare severity and frequency rates against prior records.

## **SUPERVISOR'S RESPONSIBILITY**

BCI supervisors' attitudes play an important part in obtaining or preventing the acceptance of safe and healthful work practices, policies, and procedures. It is the supervisor's responsibility to identify potential hazards, identify methods to control or eliminate the hazards, ensure employees engage in safe and healthful work practices, and ensure employees receive safety and health training to do their work. Safety and health performance will be part of our supervisors' evaluations.

## **SAFETY AND HEALTH COMMITTEE**

Our management will take an active role on the safety and health committee. At least annually the safety and health committee will develop written safety and health goals and track monthly progress. These goals will be communicated to all employees. Our committee will be comprised of management and hourly employees. Members of committee will be appointed or accepted volunteers and will serve on the committee for one year terms with half being replaced each year to assure continuity and consistency. Agendas and minutes of meetings shall be provided to all employees.

The purpose of our safety and health committee is to participate in the implementation of the safety and health system at BCI.

Our committee will be comprised of management and employee representatives. Our committee will meet periodically to review current trends in safety and job-specific safety concerns. The committee will:

- Have defined goals and objectives.
- Address safety and health issues.
- Record and post minutes of the meetings.
- Involve employees in problem solving.
- Document action taken and post on the bulletin boards for all employees to read and-or comment.
- Have a formal agenda.

## **RESPONDING TO ANY SAFETY AND HEALTH ISSUES**

Our management will take prompt consistent action when responding to safety and health issues. They will demonstrate our management commitment to addressing safety and health concerns and encourage employee participation.

Management will respond to employees' reports of hazards or potential hazards with a First Report of Incident/close calls /catches and identification of hazards discovered on job sites.

Immediate supervisors will review, investigate, and take any necessary and appropriate action on all employee reports of hazards or potential hazards. The employee reporting the hazard or potential hazard will be notified of the outcome.

Reporting of hazards or potential hazards will be without fear of reprimand.

## **SAFETY SUGGESTION SYSTEM**

Our employees are encouraged to make safety and health suggestions to help improve a process, prevent an accident, or to make any improvement in the safety and health system. The suggestion system will be implemented by our Safety Department and Project Superintendent and they will be responsible for determining priority and the proper means of implementation. Safety suggestions will be shared with the safety and health committee for input. Suggestion forms can be placed in suggestion boxes at BCI job site office.

## **EMPLOYEE PARTICIPATION**

Our employees will be given an opportunity to provide input regarding recommendations on safety and health products, procedures, and training as it pertains to daily work operations. For example, employees may be given some responsibility to test out products or conduct research to substantiate recommendations. Employee input may be provided through the suggestion system, report of hazard, or through actions the safety and health committee initiates. Employees may participate in a variety of ways such as; a trainer, inspector, or problem solver.



## **WORKSITE ANALYSIS**

We will conduct a worksite analysis, through systematic actions that provide information as needed to recognize and understand the hazards and potential hazards of our workplace. Listed below are types of worksite analysis actions that can assist with making an inventory of potential hazards in our workplace:

- Job safety analysis.
- Comprehensive hazard surveys (insurance inspections, Safety On-site, etc.).
- Hazard analysis of changes in the workplace (new equipment, new processes).
- Regular site safety and health inspections (employee and management).
- Employee report of hazards or potential hazards.
- Accident and incident investigations with corrective actions and follow-up.
- Injury and illness trend analysis.
- Personal protective equipment assessment.
- Ergonomic analysis.
- Specific identification of confined spaces.
- Identification of energy sources for specific machines.
- Copies of written inspections and surveys by: fire department, in-house as required by safety and health standards (e.g., overhead crane inspections, powered industrial truck daily inspection, etc.).
- Establish an Emergency Action Plan

## **NEW EQUIPMENT, PROCESSES, AND FACILITY HAZARD ANALYSIS**

The Safety Department will analyze new facilities, equipment, processes, and materials for hazards and potential hazards. Findings will be documented and plans developed to minimize or design out the hazards.

## **JOB SAFETY ANALYSIS**

BCI will utilize job safety analysis to determine potential hazards and identify methods to reduce exposure to the hazards. Job Safety Analysis (JSA) is a method of planning for safety and health. There are three parts to the JSA.

The first component of a JSA is breaking down a job or task into the specific steps it takes to complete the job. Although this can be done in small detail, typically only the major steps are listed. This often results in five to ten steps. The steps are listed in chronological order, listing the first thing that must be done, and then what comes next, and so on.

The second component of a JSA is to list all the hazards that are involved in each step. There may be many hazards that get listed next to some steps and may not be any associated with some steps.

The third step is to write down how each hazard will be eliminated or controlled. In other words, describe what needs to be done in order to perform that task safely.

Job safety analysis is often called different things. Other names for it include: job hazard analysis, job task analysis, task hazard analysis, and safety task analysis. Job hazard analysis (Attachments 9) takes place prior to starting new work activities. OSHA 29 CFR requires a Job Briefing covering 5 topics, Hazards, Work Practices, Special Precautions, Energy Sources, and PPE, prior to the beginning of work each day or job.

## **SAFETY INSPECTIONS**

Our employees will participate in regular periodic safety and health inspections to help identify potentially hazardous conditions and unsafe actions and initiate corrections. Findings will be presented to the Safety Department, for review. Corrective action will be implemented under the direction of the Project Superintendent and the Safety Department in a timely manner.

## **EMPLOYEE REPORT OF HAZARDS**

Our employees play a key role in identifying, controlling, and reporting hazards that may occur or already exist in the workplace. Employee reports of potential hazards can be an effective tool to trigger a closer look at a piece of equipment, operation, or how work is being performed. Reports of potential hazards can also provide suggestions to eliminate a hazard.

## **HAZARD PREVENTION AND CONTROL**

Our management will develop systems to prevent and control hazards. These include:

- establishment of controls through engineering
- work practice, personal protective equipment, and/or administrative actions
- systems to track hazard correction; preventive maintenance systems
- emergency preparation
- medical program.

Our written system will be implemented to assure guards, housekeeping, and personal protective equipment are provided and being used.

A written plan of action for the correction of hazards found in the workplace will be implemented by the Safety Department. Actions will be communicated to all employees.

A maintenance schedule for all vehicles and equipment will be established by BCI Fleet Maintenance. Maintenance logs will be kept to document work performed and repairs scheduled or ordered.

Required written programs will include, but not limited to:

- lockout/tag out
- respiratory protection
- right to know
- confined space
- asbestos
- lead
- fork lift

All training records will indicate the compliance of all employees.

Through a team effort all employees at BCI will make “safety checks” a part of routine work practices. BCI requires adherence to all performance and consensus standards establishing a “ZERO” Incident Culture.

## **JOB SITE INSPECTIONS**

BCI will conduct daily job site inspections. Hazards will be documented, reviewed, and corrections will be made in a timely manner. More detailed, written inspections will be conducted by the Safety Department and management team on a weekly basis. The Safety Department or other designated safety person will tour job site and observe potential safety/health hazards, and develop a plan for safeguarding this company's workers which may include the following:

- Recognizing and mitigating the risks of the hazard.
- Guarding against the hazard as required by identification and training
- Providing personal protective (Attachments 25) equipment and enforcing its use.
- Training workers in safe work practices.
- Coordinating protection of workers through other contractors. A record of all safety inspections and correctional steps will be kept.

## **ACCIDENT/INCIDENT INVESTIGATION**

BCI management shall conduct an investigation for all accidents/incidents and near misses. Our primary goal of conducting an investigation is to determine the "root cause" to prevent the risk of a future occurrence. Investigation reports can help determine injury and illness trends over time, so that patterns with common causes can be identified and prevented. Investigations are not intended to place blame.

All accidents, no matter how minor must be reported to the Foreman immediately.

Accidents and "near-miss" incidents will be investigated by the Project Superintendent. The reports will be reviewed by the Safety Department within 24 hours of an accident/incident.

Foremen must complete an initial written accident investigation (Attachments 6 & 7) the day of the accident.

All workers involved in the accident or who witnessed the accident must complete a written statement describing the incident.

The Safety Department will complete a thorough accident investigation (Attachments 6 & 7) to determine root causes and corrective actions.

Near misses (situations where an accident almost happened) should be reported.

Corrective action must be taken to prevent the same situation from occurring again with the potential for serious injury. Foremen should make a note of near misses and the corrective actions taken and report them to the Project Superintendent and the Safety Department, so that the same corrections may be made on all the company's job sites.

## **PERSONAL PROTECTIVE EQUIPMENT**

Hard hats will be worn on job sites at all times.

Safety Glasses meeting ANSI Z87.1 eye protection standard will be worn when there are potentials of hazards from flying objects or particles, chemicals, arcing, glare, or dust.

Leather work boots shall be worn as a minimum at all job sites to protect the employee's feet. Safety toe footwear may be necessary as indicated by work being performed. Athletic or canvas-type shoes shall not be worn.

Protective gloves or clothing shall be worn when required to protect against a hazard.

Harnesses and lanyards (Attachment 19) shall be utilized for fall protection as required.

A guide to personal protective equipment is available from OSHA. It is written for general industry, but applies to all construction work, also. It is found in CFR 1910.131 Performance Standard.

## **POLICIES, PROCEDURES, SAFETY AND HEALTH RULES**

Management is responsible for implementing policies and safety and health procedures. Specific safety and health procedures that are required by OSHA will be put in writing. A copy of our written safety program will be available on every jobsite, either in the jobsite office, or with the foremen. The required OSHA posters will be posted in the field offices and the home offices.

BCI will inform and enforce the following safety rules:

- All of our safety rules must be obeyed. Failure to do so will result in strict disciplinary action up to and including termination
- Wear appropriate clothing and use sun block to prevent sunburn.
- Watch where you are walking. Do not run. Keep your mind on your work at all times.
- The use of illegal drugs or alcohol or being under the influence during working hours shall be cause for termination. Inform your supervisor if taking any prescribed medications which can cause any type of physical and/or mental impairment.
- Do not distract the attention of fellow workers or engage in horseplay. Do not engage in any act which would endanger another employee.
- Keep your working area free from rubbish, debris and excess materials. A clean job is the start of a safe job.
- Do not use a compressor to blow dust or dirt from your clothes, hair, or hands.
- Report any fear of working at heights to your supervisor.
- Know where fire extinguishers are located and how to use them.
- Lift correctly - with legs, not the back. If the load is too heavy GET HELP. Do stretching exercises prior to work activities. Approximately twenty percent of all construction related injuries result from lifting materials.
- Maintain Minimum Approach Distances on all exposed energized conductors and equipment. Assure that 2 qualified employees present when working in vicinity of energized conductors and equipment energized at 600 volts or more
- Nobody but the operator shall be allowed to ride on equipment unless the equipment is designed to carry a passenger.
- Do not use power tools and equipment until you have been properly instructed in the safe work methods and become authorized to use them.
- Do not remove, displace, damage, or destroy any safety device or safeguard on equipment or machinery.
- Barricade danger areas. Guard rails or perimeter warning may be required. Do not enter an area which has been barricaded. Public shall be protected at all times.
- All Guard Structures and Ride Over shall be installed to protect road ways and existing energized distribution and transmission crossings.
- All equipment used in installation, guarding, grounding and sagging of new conductors shall meet ANSI and ASTM Standards
- Any air or helicopter operations shall meet all OSHA and FAA performance standards
- If you must work around power shovels, trucks, rough-terrain fork-lifts, dozers, or other heavy equipment, make sure operators can always see you.
- Never walk within the swing radius of equipment counterweights.
- Never stand next to trucks when load straps are being released.

- Barricades are required for cranes.
- High visibility vests may be used to increase your visibility.
- Never oil, lubricate or fuel equipment while it is running or in motion.
- Before servicing, repairing, or adjusting any powered tool or piece of equipment, disconnect it, lock out the source of power, and tag it out.
- Excavations over five feet deep must be shored or sloped as required.
  - Keep out of trenches or cuts that are not properly shored or sloped.
  - Excavated material or other debris shall not be stored nearer than two feet from the edge of the excavation.
  - Excavations less than 5 feet will require cave in protection where conditions indicate possible side failure.
  - All parts of 29 CFR 1926 (p) shall be met
- Practice the following safety procedures when using ladders:
  - Use the "four to one" rule when using a ladder. One foot of base for every four feet of height.
  - Portable ladders in use shall be equipped with safety foot pads unless the ladders are tied, blocked or otherwise secured. Step ladders shall not be used as a straight ladder.
  - Ladders must extend three feet above landing for proper use.
  - Defective ladders must be properly tagged and removed from service.
  - Keep ladder bases free of debris, hoses, wires, materials, etc.
- Build scaffolds according to manufacturers' recommendations and OSHA Construction Performance Standard 29 CFR 1926 Sub Part L
  - Scaffolds over 10' must have guardrails on all open sides.
  - Scaffold planks shall be properly lapped, cleated or otherwise secured to prevent shifting.
  - Ladder access to scaffolds shall be provided
- Use only extension cords of the three-prong type. Use ground fault circuit interrupters at all times with any temporary power supply.
- Fall protection is required at 4' or higher on poles and structures and 6' on all other walking and working surfaces. 100% tie-off means the harness and lanyard are always connected to anchorage (Attachment 19).
- Never throw or drop anything from structures. Someone passing below may be seriously injured.

Know what emergency procedures have been established for your job site. (Location of emergency phone, first aid kit, stretcher location, fire extinguisher locations, evacuation plan, etc.).

Never enter a manhole, well, shaft, tunnel or other confined space which could possibly have a hazardous atmosphere because of lack of oxygen, or presence of toxic or flammable gas, or has a possibility of engulfment by solids or liquids.

- Only a competent qualified person will test the confined area with an appropriate detector before entry.
- Wear the necessary personal protective (Attachments 25) equipment.
- Provide ventilation by blowing fresh air into the confined space.
- An attendant (hole-watch) may be required to be stationed at the entrance.
- 29 CFR 1910.146 OSHA Standards shall be followed

## **SAFETY DISCIPLINE**

BCI has implemented the following four step disciplinary system when safety rules are not followed or other unsafe actions endanger workers.

- First violation: Oral warning; notation for personnel file.
- Second violation: Written warning; copy for personnel file.
- Third violation: Written warning; one day suspension without pay.
- Fourth violation: Written warning and one-week suspension, or termination.

Zero-tolerance Violations: Some safety violations are of such serious nature that there will be no warnings and termination may result. Examples include:

- Entering hazardous confined spaces (Attachments 12, 13 & 14) without following proper procedures,
- Failing to use fall protection equipment,
- Entering unsafe excavations.
- Both the employee and the supervisor allowing these unsafe acts may be terminated. A record will be maintained of all disciplinary actions.

## **LOCKOUT / TAGOUT**

Lockout / Tag out (LOTO) assures that employees are protected from unintended machine motion or unintended release of energy which could cause injury. This includes electricity, water, steam, hydraulic, gravity, and many other sources of stored energy.

All sources of energy must be shut off, de-energized at the source, and locked-out prior to any employee beginning work around or on the potential hazard.

29 CFR 1910 (m) Switching and Tagging and 29 CFR 1910 (n) Grounding for the protection of the employee shall be adhered to when obtaining clearances and grounding for the protection of any induced voltages.

## **CONFINED SPACE ENTRY**

No employee shall enter confined spaces without authorization (Attachments 12, 13 & 14). A confined space is defined as the following:

- A space that is NOT DESIGNED FOR CONTINUOUS employee OCCUPANCY, and is large enough and so configured that a person can bodily enter into and perform assigned work, and
- Has LIMITED or RESTRICTED means for ENTRY or EXIT.

Confined spaces that may have a HAZARDOUS ATMOSPHERE require special precautions. Hazardous atmospheres are those that may expose employees to the risk of death, incapacitation, and impairment of ability to self-rescue caused by:

- Flammable gas,
- Airborne combustible dust,
- Atmospheric oxygen concentration below 19.5 or above 23.5%,
- A toxic atmosphere or substance,
- Danger of engulfment.

## **WRITTEN HAZARD COMMUNICATION PROGRAM**

Hazard communication means ensuring that all workers know about the chemicals that they work with and work around. Often called “Right to Know,” the hazard communication program involves the following elements:

- Written hazard communication program.
- Training on the chemicals this company uses.
- Labeling: using properly labeled containers.
- Safety Data Sheets (SDS) (Formerly Material Safety Data Sheets (MSDS)): SDS must be readily available onsite. Workers must know where to find SDS and be able to read and properly utilize an SDS.
- Posting signs to inform employees of the location of SDS and when new chemicals are brought on the job site.

Informing other contractors. If we use chemicals around other contractors, it is our responsibility to inform other contractors of the hazards involved. We will make every effort to keep other contractors safe from the chemicals we use. Typically, the general contractor onsite will need to coordinate all chemical use of all contractors to maintain a safe workplace.

## **FALL PROTECTION PROGRAM**

Construction fall protection is required whenever working at six feet (including use of aerial lifts) or above the next lower level.

Fall protection will be provided by one or more of the following:

- Guardrails,
- Hole covers,
- Safety nets,
- Personal fall arrest system (harness and lanyard).

29 CFR 1910.269 Standard requiring qualifying of employees climbing poles and structures shall be followed. Employees shall be qualified climbers and shall have fall protection above 4’ on poles and structures.

## **ELECTRICAL SAFETY**

Electrical safety involves two primary issues:

- Energized Power lines,
- Temporary and permanent electrical wiring and equipment.

To avoid electrical incidents, several basic safety rules must be followed:

- Minimum Approach Distances found in 29 CFR 1910.269 (l) shall be maintained all at times while working around and in the vicinity of energized conductors and equipment...
- 29 CFR 1910.269 (m) Grounding for the protection of the employees requirements shall be met
- Do not store materials under power lines in lay down yards and job sites
- Use ground fault circuit interrupters (GFCI) whenever plugging into temporary power or using an extension cord.
- Extension cords and power tool cords with missing ground prongs, or damage to the cord must be removed from service.
- Do not operate wet power tools.
- Keep power and extension cords from being damaged in doorways or being run over.

- Keep power and extension cords out of wet areas.
- Only a qualified and trained individual may make electrical repairs.
- Assume all wires and electrical boxes are live, unless verified to be de-energized and grounded by a qualified and trained individual and LOTO has been employed.
- Do not store any materials within 3 feet of electrical boxes.

## **TRENCH AND EXCAVATION SAFETY**

Pre-job planning is vital to accident-free excavations and trenching; safety cannot be improvised as work progresses.

The following concerns must be addressed by a qualified person.

- Evaluate soil conditions and select and construct appropriate protective systems in accordance with 29 CFR 1926 Sub Part P Excavation, Trenching and Shoring.
- You must use protective systems if the trench is 5' or deeper.
- If the trench is less than 5' but is hazardous due to soil or the nature of the trench, then you must use protective systems.
- Contact local "One Call" service to locate underground lines at least 3 days prior to excavating.

Appropriate protective systems to prevent a cave-in may include:

- trench boxes,
- shoring,
- benching of trench sides,
- sloping of trench sides.

Competent person shall inspect the site daily at the start of each shift, following a rainstorm, or after any other hazard-increasing event.

Plan for traffic control when necessary:

- Refer to the Manual on Uniform Traffic Control (MUTCD) for traffic control when working on roads and right of ways.
- Determine proximity to structures that could affect choice of protective systems. For example, ensure roads, sidewalks, or buildings are not too close to allow the use of a trench box or adequate sloping.
- Test for low oxygen, and hazardous gases and vapors, especially when gasoline engine-driven equipment is running, or the dirt has been contaminated by leaking lines or storage tanks. Fuel-powered equipment produces carbon monoxide in the exhaust and must not be used without adequate ventilation. Provide appropriate respiratory protection when necessary (Attachments 35 - 40).
- Provide safe access into and out of the excavation. If the excavation is 4' or greater, ensure a ladder is within 25' of workers in the excavation.
- Provide appropriate protections if water accumulation is a problem. Water flow and accumulation must be inspected and must be controlled.
- Keep excavations open the minimum amount of time needed to complete operations.



## **SAFETY AND HEALTH TRAINING**

BCI provide training to assure the requirements of OSHA standards are met and continuously evaluate employee training needs to keep workers safe and healthy on the job.

New Employee Orientation: New employees will receive training on the company safety and health management system, safe work practices and expectations, and specific safety and health training for the tasks that they will perform.

After inspecting a job site:

- Employees shall identify and evaluate all potential hazards for potential of serious injuries and probability of an accident.
- Actions will be taken to minimize the hazards and protect the workers.
- Any safety related questions or work procedures shall be discussed with the Safety Department.

The Safety Department or other designated site safety person will appraise the skill and knowledge level of exposed workers, and provide any needed training.

Training length and level of detail will be determined by the severity of the hazards and the requirements of OSHA.

Records will be maintained for all training sessions with descriptions of topics covered and names of workers trained.

Toolbox Talks: Toolbox talks will be conducted regularly daily. Topics covered will include:

- The safe work practices necessary for that day's work.
- Any safety concerns workers may have.
- Brief refresher training on relevant safety topics by the Safety Department or designated site safety person.

## **SAFETY AND HEALTH WORK OBSERVATIONS**

Safety and health work observations shall be performed periodically by supervisors or designated observers.

Safety and health work observations ensure:

- an employee has the knowledge to perform the work as trained
- employee is performing their work task safely
- identify the attitude of the employees toward safety by observations of critical behaviors

Specific observations or audits are especially critical for grounding of conductors, any energized work, and rigging, use of PPE or where the risk of exposure is high.

Results will be documented and follow-up training will be provided as needed when identified. This process helps assure safety and health training is effective.

BRINK  
CONSTRUCTORS INC.,  
HEALTH & SAFETY  
MANUAL  
**POLICIES**

# COMPANY SAFETY POLICY

This document provides the guidelines for the overall management of safety issues to ensure safety is managed equal to customer service, employee morale, production, financial performance and quality of service.

## PHILOSOPHY

The safety philosophy of BCI is based on the following principles:

- All injuries and occupational illnesses are preventable.
- Safety is the responsibility of each employee with leadership provided by all levels of management.
- All construction and operating exposures can be reasonably safeguarded.
- Management has a responsibility to train all employees to work safely.
- Preventing incidents, accidents, and injuries is good, sound business.
- Working safely is a condition of employment.
- All incidents will be investigated and reviewed in order to reduce the chances of re-occurrence.

## SAFETY GOAL

The overall safety goal is “**ZERO**” accidents. All efforts in safety are to be designed and executed to maintain this goal.

## SCOPE

Based on the safety goal and philosophy, every employee as part of his or her job performance is expected to:

- Actively strive to maintain safe and healthy working conditions.
- Adhere to accepted operating practices and procedures, both internal and external to the Company, designed to prevent injuries, illness, and property damage.
- Comply with all Federal, State, local, and BCI safety rules and regulations.
- Report all incidents, regardless of severity, to the proper personnel in the reporting structure.

## RESPONSIBILITY

The success of the safety effort is dependent upon each employee accepting the responsibility of preventing injuries, occupational illnesses, and property damage.

## EXECUTIVE MANAGEMENT

- Responsible for implementing safety policy and procedure, assigning authority, measuring the use of authority, and providing general support to the line organization to accomplish the safety objective.

**MANAGERS/SUPERINTENDENTS/SUPERVISORS (Leaders)** of the line organization are authorized and expected to actively strive to prevent accidents in their areas of responsibility by providing leadership, motivation, direction, training, and equipment to accomplish the job safely and efficiently. The following are specific items required:

- Use all reasonable efforts to maintain safe working conditions and practices for the safety of all employees under their supervision.
- Require good housekeeping in their locations.
- Assist in providing safety training to all employees reporting to them with guidance provided by the Safety Department.
- Perform Job Hazard Analyses and fully explain known job hazards and corresponding safety procedures to employees before work begins.
- Require the use of personal protective equipment (PPE) in accordance with BCI safety rules and OSHA regulations.
- Encourage employee safety suggestions and give them timely and due consideration upon submission.
- Conduct weekly job location safety meetings (Attachments 10) to affect safe practices, work methods, and provide safety training. BCI Safety Meeting Report (Attachments 10) is to be completed and sent to the Safety Department for OSHA compliance filing.
- Administer positive discipline for safety law, rule, policy, or procedure violations in accordance with existing BCI company disciplinary guidelines.
- Conduct accident investigations (Attachments 6 & 7) and prepare appropriate reports on all accidents.
- Conduct periodic inspections, reviews, and audits to determine employee safety compliance and the effectiveness of the program.

**FOREMEN** are authorized and expected to use effective supervisory skills to prevent accidents in their work areas. The following are specific items required:

- Expected to enforce all general and departmental safety rules and work practices.
- Use performance contacts to correct safety performance problems and provide management with proper documentation when a pattern develops. These individuals are required to notify their supervisors or managers when a serious safety violation or problem occurs.
- Report all accidents and see that basic first aid is rendered in the case of injury.
- Assist in the investigation of all accidents, including near-miss incidents, which occur in their work areas and assist in the preparation of the accident reports.

**EMPLOYEES** are expected to actively strive to eliminate unsafe acts and unsafe conditions and follow the required items:

- Report to their immediate supervisor and seek first aid for all injuries, however minor they may be.
- Report unsafe conditions, equipment, or practices to their immediate supervisor as soon as possible.
- Read and abide by the BCI Safety Manual.
- Expected to use the appropriate personal protective equipment necessary for safe completion of the job.
- Consider working safely and active participation in safety meetings (Attachments 10) as integral parts of their jobs.
- Encouraged to submit safety suggestions to the Safety Department and management.
- Complete an accident report for all accidents in a prompt manner.

**THE SAFETY DEPARTMENT** is to serve as the catalyst for the adoption, development, and implementation of an effective safety effort for BCI and will:

- Be responsible for maintaining all required OSHA records and logs of accidents for BCI and will provide resources and support to the organization as directed by the Board of Directors of BCI.
- Ensure that all Federal, State, local, and BCI safety rules and regulations are complied with.
- Be responsible for the continuous and effective promotion of safety awareness within BCI.
- Responsible for providing safety training to all levels of the organization.
- Investigate all incidents and accidents, prepare all necessary reports, and submit these reports to the appropriate individuals and entities.
- Provide a monthly report to management updating the status of the BCI safety effort.
- Submit a review and summary of all accident reports complete with recommendations for future prevention, to the Board of Directors.

**No job is to be considered completed efficiently unless workers have followed every precaution and safety rule to protect themselves, their fellow employees, and the general public from bodily injury and property damage.**

## STOP WORK POLICY

Reviewed April 17, 2013



All employees and subcontractors of BCI are empowered and expected to stop work activities if it becomes apparent that such activities are considered to be an imminent danger.

Should any occasion arise where it is felt that to commence or continue with a work activity which may result in harm to humans, animals, environment or assets, then work shall cease immediately and the task re-evaluated for a safer approach.

If there is any doubt about ceasing the activity, your immediate supervisor and Jobsite Superintendent shall be advised and consulted on the best way to continue.

BCI is committed to providing an incident free and safe working environment and believes that safety is the responsibility of each employee, with leadership provided at all levels of management.

Signed by: Signature on file

Date: \_\_\_\_\_

Zane Brink - President

# DRUG AND ALCOHOL POLICY

The object and purpose of this policy is to comply with applicable “*Federal Regulations*” governing workplace drug and alcohol abuse and misuse. BCI is concerned for the health and wellbeing of all of its employees.

All employees of BCI are required to participate in this drug and alcohol-testing program (Attachment 3). Employees who operate with a Commercial Driver’s License (CDL), perform a safety sensitive job or supervise safety sensitive jobs are required as of January 1, 1996 to participate in such a program as mandated by the “**Federal Highway Administration Department of Transportation**”.

## PROHIBITED USE

### Controlled Substances:

Urine drug testing will screen for all regulated substances:

No employee, or employer having knowledge of, shall permit an employee to:

- Report for or remain on duty when using any controlled substance.
  - **Exception:** If the use is pursuant to instructions of a physician who has advised the driver that the substance does not adversely affect the ability to safely operate a motor vehicle or perform their job duties.
- Report for or remain on duty after having tested positive for a controlled substance.

BCI requires that any therapeutic drug usage be reported to your supervisor. This policy prohibits the use of medical marijuana, in conformance with federal laws.

### Alcohol:

No employee, or employer having knowledge of, shall permit an employee to:

- Report for duty or remain on duty while having an alcohol concentration of 0.04 or greater.
- Use alcohol while performing their duties or during the time frame of their work day schedule (including lunch and all breaks)
- Perform their job duties within (4) four hours of alcohol use.
- Possess alcohol while on duty or operating a Company vehicle.
- Use alcohol within (8) eight hours of an accident or until post-accident testing is complete.

## **REQUIRED TESTING**

### **Pre-employment:**

All employees of BCI must undergo and have a verified negative controlled substance test result prior to time of employment. The cost of this test will be reimbursed by BCI.

A re-employment test may be required of a past employee, depending on the length of absence.

### **Post-accident testing:**

All accidents, serious in nature, will require the employee(s) involved to undergo an alcohol and controlled substance test. This test must be performed as soon as possible following an accident involving a loss of life. It is also required if a citation for a moving violation was issued **AND** any vehicle required towing from the scene, or any injury required medical care away from the scene. The seriousness of all accidents, which do not follow under the above guidelines, will be determined by project supervision. The cost of this test will be paid by BCI.

### **Random testing:**

An annual rate of 10% of BCI employees will be tested for alcohol and 50% will be tested for controlled substances. These tests are unannounced and are spread throughout the year. Each employee has an equal chance of testing at each selection. A random selection will be made by a computer generated program each quarter. Your supervisor will be notified when your number has been selected. Employees must proceed to the collection test site as soon as possible. The cost of this test will be paid by BCI.

### **Reasonable Suspicion:**

Employees are required to submit for alcohol or controlled substance testing whenever there is a reasonable suspicion. Project supervisors and foreman will be trained in behavior observation techniques. Testing should occur as soon as possible: controlled substances must be done within 32 hours, alcohol should occur by 2 hours and within 8 hours of determination. The cost of this test will be paid by BCI.

### **Return to Duty:**

Employees who have engaged in prohibited conduct must undergo controlled substance or alcohol testing with verified negative results prior to return to duty. The cost of this test will be paid by the employee. The employee is encouraged to seek counseling and treatment programs. A "*Substance Abuse Professional*" will evaluate the employee and make the determination when the employee may return to duty. The cost of counseling and treatment will be paid by the employee.

### **Follow-up:**

If the employee returns to duty, he / she are subject to a minimum of 6 unannounced follow-up tests in the first 12 months. The cost of these tests will be paid by the employee.



# TESTING PROCEDURE

Testing shall be conducted in a manner to assure adherence to standards of confidentiality, privacy, accuracy, and reliability as approved by the “*Department of Health and Human Services*” and the “*Department of Transportation*”. Each project supervisor will be responsible for locating a collection / testing lab near each jobsite. All results from testing will be reported to one person at the Rapid City office. Supervision and Company Officers will have access to the results. “Confidentiality” of results is a high priority.

## Controlled Substance Testing:

- Urine will be the required substance and will be collected under controlled circumstances.
- Urine shall be divided into split specimens (2 containers) and each shall be labeled thoroughly to preserve identity.
- Specimens are transported to a Department of Health and Human Services approved testing lab.
- Specimens undergo testing by an initial screening procedure which is followed by confirmation by GC / MS testing, if necessary.
- The urine is positive for a substance if the substance is present in an amount greater than a minimum threshold.
- A medical review officer will contact the donor if there is a positive result to verify the results.
- The medical review officer reports the results to the employer.
- The medical review officer gives the donor the option of testing the remaining split specimen at a lab of their choice. This second testing will be at the expense of the employee.

## Alcohol:

- Breath is tested for alcohol.
- The test is conducted by a certified Breath Alcohol technician.
- The tester uses an approved Evidential Breath Testing Device.
- The initial test must give results of less than 0.02, or a retest (confirmation) must be done following a 15 minute wait.
- If the confirmation reveals a concentration of greater than 0.02, the driver is in violation of the rule.
- Post-accident breath or blood testing may be conducted by Federal, State, or local officials having independent authority, if the results cannot be obtained by the employer.

## REFUSAL TO SUBMIT

An employee is determined to have refused to submit to testing if:

- There is a refusal to take the test.
- There is an inability to produce urine, after 24 ounces of fluid and 2 hours are allowed, or breathe, with an absence of valid medical explanation.
- False information has been provided by the employee
- The employee fails to report within the required time period for testing.
- The rule requires that employees must be removed from safety sensitive functions.

## **CONSEQUENCES**

Any violations or refusals require that the employee be removed from any safety sensitive functions. If an employee is in violation, they will be referred to a Substance Abuse Professional (SAP). This (SAP) will evaluate and resolve the misuse. A listing of SAPs for the Black Hills Area is on the following page. Employees who are not in the local area will be given a listing of SAPs in their community. If the employer desires and permits the employee to return, the employee must undergo *return to duty testing* with a verified negative result and if identified by the Substance Abuse Professional as needing assistance in resolving misuse, must have been evaluated by the SAP for compliance with the rehabilitation. The employee is then subject to unannounced follow-up testing as directed by the SAP. This is at least 6 tests in the first 12 months. The cost of these tests will be paid by the employee.

In the case of alcohol testing, if the employee has an alcohol level of greater than 0.02, but less than 0.04, they must be removed from safety sensitive functions for 24 hours.

## **TRAINING**

Those designated to determine if reasonable suspicion exists must receive 60 minutes of alcohol and 60 minutes on controlled substance training which covers the physical, behavioral, speech, and performance indicators of misuse.

## **SUBSTANCE ABUSE PROFESSIONAL**

### **REFERRAL OPTIONS AND RESOURCES**

Substance Abuse Professional (SAP) defined:

A licensed physician (medical doctor or doctor of Osteopathy), or a licensed or certified psychologist, social worker, employee assistance professional, or addiction counselor certified by the "*National Association of Alcoholism and Drug Abuse Counselors Certification Commission*" with knowledge of and clinical experience in the diagnosis and treatment of alcohol and controlled substance-related disorders.

Other options include any M.D. or D.O. willing and able to perform the assessment. The local yellow pages have complete physician listings.

OR: Any professional who meets the requirements of the above definition.

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HEALTH & SAFETY  
MANUAL  
**PROGRAMS**

# **ACCIDENT AND INCIDENT INVESTIGATION AND REPORTING PROGRAM**

## **POLICY**

Investigation of any accident is an important management tool for controlling accidents and their related costs. If something is not learned from an accident, it is a total loss. Something causes accidents. The reasons or basic root causes must be determined. The information that is learned can be used to improve the operation involved and make it more safe and efficient. It is, therefore, a policy of BCI that the Project Superintendent or site supervisor, in conjunction with the Safety Department, investigates all injuries requiring a visit to a physician, clinic or hospital and any property damage incidents involving \$500 or more or near misses (Attachment 4) that had the potential to result in an accident of this magnitude.

However, even if no report is submitted, all incidents, including "near misses," should be questioned using the same investigative techniques in order that corrective action may be taken to prevent a similar incident from occurring. While all incidents should be investigated, the extent of such investigation shall reflect the seriousness of the incident utilizing a root cause analysis process or other similar method.

Accidents are usually the result of conditions or actions that the supervisors and employees are often in the best position to control. An accident is simply an unplanned event that interrupts operations and results in loss of time, property damage or bodily injury. They usually arise from one of four areas: equipment, material, people or environment.

## **THE PURPOSE OF ACCIDENT INVESTIGATIONS**

Millions of words have been written explaining the importance and purpose of accident investigations, but they can all be summarized in one word - prevention. There are many benefits from accident investigations, but one purpose - prevention.

This is how investigations will help prevent future accidents:

- Investigations uncover unknown factors which can lead to accidents. It develops why the employee operated in the way he did or why the physical condition developed.
- Investigations develop personal factors which the employee has which may also be involved with other employees and may contribute to the same or more serious accidents.
- By investigating for prevention of accidents, we communicate to employees our concern for the employee and desire to provide a safe workplace which improves morale and safety conscientiousness.
- Investigations usually uncover improvements in the way the job can be done - improved efficiency and reduction in exposures.

A simple, small accident may have potential to have been a major loss. We may have been just "lucky." Without investigations of these, we may be lulled into thinking our major exposures are under control until we have a major or serious loss. The purpose of investigations is not be "place blame" on anyone, but to determine what within the system went wrong so that it may be corrected. This attitude during an investigation produces an environment that will assist in obtaining more effective answers and facts.

## **RESPONSIBILITIES**

Individual responsibilities for reporting and investigation must be pre-determined and assigned prior to incidents. For BCI that means each supervisor should conduct these investigations using an accident /investigation form, along with the Safety Department. The immediate supervisor is the most knowledgeable of the work area and thus, best able to determine most of the underlying causes of an accident. Depending on the nature and/ or severity of the accident and/ or other conditions, accidents may also be investigated by the project manager, superintendent, the Safety Department, or even the Safety Committee.

Personnel must be trained in their roles and responsibilities for incident response and incident investigation techniques. Training relative to incident investigation and reporting (Awareness, First Responder, Investigation, and training frequency) shall be conducted for all supervisors initially upon assignment, and every three (3) years thereafter.

## **HOW TO INVESTIGATE AN ACCIDENT**

The first step in any accident investigation (Attachments 6 & 7) is to ensure that all injured parties have received emergency rescue and medical assistance, as needed. Reporting of the incident must occur in a specified manner and the reporting sequence must be posted. For example, in the event of an incident, the following are contacted in order:

- 911;
- Project Superintendent;
- Project Manager;
- Division Head;
- Security;
- Human resources;
- Safety Department; and
- Other organizations as required.

BCI must also verbally report required incidents to OSHA within 8 hours of their discovery. OSHA requires reporting of work related incidents resulting in the death of an employee or the hospitalization of three or more employees arising from one incident.

Site owners typically require all incidents to be reported including, but not limited to, injuries, spills, property damage, fires, explosions, and vehicle damage. Incidents will be reported to the site owner as soon as possible or in a timely manner (at least within 24 hours of incident). Once this is complete, a systematic approach to determining the facts surrounding the cause or causes of the accident should be initiated. A suggested approach to the accident investigation follows:

- Neutralize, secure or isolate any hazardous conditions to prevent further injuries.
- This step may also require that an unsafe act(s) be halted or stopped.
- Employees who could be first responders shall be trained and qualified in first aid techniques to control the degree of loss during the immediate post-incident phase.
  - After immediate rescue, actions to prevent further loss should occur. For example, maintenance personnel should be summoned to assess integrity of buildings and equipment, engineering personnel to evaluate the need for bracing of structures, and special equipment/response requirements such as safe rendering of hazardous materials or explosives employed.
- Once the potential for further injury has been reasonably secured, the investigation should focus on determining the facts relating to the accident.
  - Equipment may include some or all of the following items; writing equipment such as pens/paper,

measurement equipment such as tape measures and rulers, cameras, small tools, audio recorder, PPE, marking devices such as flags, equipment manuals, etc.

- Accident fact finding should be conducted using a logical step-by-step process. Following is a suggested method:
  - Secure the accident scene using barricades or other methods, to protect evidence.
  - Initial identification of evidence immediately following the incident might include a listing of people, equipment, and materials involved and a recording of environmental factors such as weather, illumination, temperature, noise, ventilation, etc.
  - Evidence such as people, positions of equipment, parts, and papers must be preserved, secured, and collected through notes, photographs, witness statements, flagging, and impoundment of documents and equipment.
  - Make video of the site and/or take photographs from as many angles as possible to create a visual record of the scene. If needed, make sketches and/or drawings of the scene.
  - Collect and preserve evidence. Document where, when and how evidence was collected.
- Document the facts only, avoid opinions. A photographic record of evidence collection could be helpful and may be extremely valuable in the final analysis of the accident. Do not leave any stone unturned when collecting evidence. The scene will never be better for collecting evidence and determining facts than during the initial investigation immediately following the incident.
- Look for hard evidence. This is factual information that is obvious and difficult to dispute, such as, equipment condition, building or structure condition, the existence or non-existence of personal protective equipment or engineering controls, broken parts or pieces, time logs, training logs, etc.
- If a piece of evidence needs further analysis by an expert, such as a broken tool or damaged equipment, tag the item, document the circumstances surrounding it and send it for analysis.
- An important step in any accident investigation is to interview the persons closely associated with the accident or incident. Witness interviews and statements must be collected. Locating witnesses, ensuring unbiased testimony, obtaining appropriate interview locations, and use of trained interviewers should be detailed. The need for follow-up interviews should also be addressed. There are certain proven techniques for successful interviews, as follows:
  - Put the person being interviewed at ease by pointing out the sole purpose is prevention of recurrence. Point out that the investigation is not for fault determination or finding out who can be blamed.
  - Conduct the interview at the scene if at all practical. This helps put the person at ease and also helps in finding solutions.
  - Conduct one-on-one interviews of all individuals involved or who witnessed the incident for their version of the accident, and do not make judgments until the facts are in. Do not conduct group interviews because important facts and details could be missed due to shy or non-participating group members.
  - Ask any necessary questions. Ask only necessary questions and all questions should be asked in a friendly, constructive manner. Use the "W" questions - WHO, WHAT, WHERE, WHEN, WHY and HOW - questions that cannot be answered with a yes or no. These will give more descriptive answers and make development of the accident causes more effective.

The underlying cause may be either an "unsafe act" or an "unsafe condition" or a combination of the two. Studies have shown that the "unsafe act" is the major contributing factor in approximately eighty-five percent (85 percent) of all accidents while "unsafe condition" is the major factor in only about fifteen percent (15 percent). It should be remembered, however, that it is much easier to uncover "unsafe conditions" than "unsafe acts" unless the investigation is complete and thorough. Do not stop with the first answer received. Continue to question until all facts are determined. Close the interview on a positive note - prevention. Thank the person(s) for their assistance in developing the facts and discuss what actions can be taken to prevent recurrences. One way to secure the person's involvement and continued cooperation is to find out what they think would prevent recurrences.

Lastly, complete the accident investigation report (Attachments 6 & 7). The report should be a summary of the facts, determined by evidence and interviews, gathered during the investigation. Do not offer opinions in the report and only draw conclusions that can be totally supported by the facts as determined by the investigation.

The investigation should be made as soon as practical after the injured person has received appropriate medical attention. The report shall be completed and submitted to BCI's Safety Department within twenty-four (24) hours after the incident occurs.

The report should not only include the basic cause of the accident, but an overall review of methods, processes and controls. The accident facts should also include corrective action to be taken in order to eliminate or greatly reduce similar occurrences. Documentation on who will be responsible for implementing corrective actions, target dates for completing the corrective actions, assigning responsibility for follow-up to ensure that corrective actions have been implemented and notes on any interim or remedial action needed, should be included in the written report. A good incident investigation should result in corrective actions, individuals should be assigned responsibilities relative to the corrective actions, and these actions should be tracked to closure. Written incident reports should be prepared and include an incident report form and a detailed narrative statement concerning the events. The format of the narrative report may include an introduction, methodology, summary of the incident, investigation board member names, narrative of the event, findings and recommendations. Photographs, witness statements, drawings, etc. should be included. Lessons learned should be reviewed and communicated. Changes to processes must be placed into effect to prevent reoccurrence or similar events.

Accidents involving serious injury such as fractures, severe lacerations, amputation, unconsciousness, etc. shall be reported immediately to the Safety Department and their Project Manager/ Superintendent who, with the Supervisor, will conduct an immediate on-the-scene investigation of the accident.

# AERIAL LIFT PROGRAM

## AERIAL LIFTS OR BUCKET TRUCKS

Aerial lifts acquired for use on or after January 22, 1973 shall be designed and constructed in conformance with the applicable requirements of the American National Standards for "Vehicle Mounted Elevating and Rotating Work Platforms," ANSI A92.2-1969, including appendix. Aerial lifts acquired before January 22, 1973 which do not meet the requirements of ANSI A92.2-1969, may not be used after January 1, 1976, unless they shall have been modified so as to conform with the applicable design and construction requirements of ANSI A92.2-1969. Under no circumstances may aerial lifts be "field modified" for uses other than those intended by the manufacturer unless the modification has been certified in writing by the manufacturer or by any equivalent entity.

Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition. Tests shall be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition (Attachment 8)

BCI shall ensure that all aerial and scissors lift operators shall be training before being allowed to operate this equipment. The Safety Department, shall document training (Attachment 42) has occurred. Only authorized persons shall operate an aerial lift.

The use of fall protection shall be required when the user / operator enters the bucket truck and begins to elevate, regardless of height. The minimum level of fall protection for the bucket truck is a lanyard and full body harness (Attachment 19). The lanyard shall be attached to the boom or basket when working from an aerial lift and is not permitted to be attached to adjacent poles or structures. The fall protection harness (Attachment 19) must be properly fastened and comfortably snug. **Body belts are not acceptable as part of a personal fall arrest system and therefore are permitted for use in an aerial lift basket.**

Personnel shall not place any item into the bucket for the purpose of increasing work height (the use of ladders, step stools and similar items are improper).

When using the articulating aerial boom on a permitted incline, the bucket shall be located on the upgrade side, in a stable position.

The vehicle has a reverse signal alarm audible above the surrounding noise level or the vehicle is backed up only when an observer signals that it is safe to proceed.

Boom and basket load limits specified by the manufacturer shall not be exceeded.. Of

If the operator is working with their hands above their head, or there is a potential for something to fall from above, the use of head protection (hard hats) is required. In other situations hardhats may still be required as determined by company policy and/ or the RSO.

Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices to create a work position.

If the operator is working in an area where persons shall pass beneath or in close proximity to the truck, then the user / operator shall adequately guard or restrict the area to prevent personal injury in the following ways:

Caution tape, barricades or rope shall serve the purpose outlined above - traffic cones alone are not permissible

Employees working below the articulating boom must be aware of the overhead hazards and shall wear the appropriate head protection, as required.



## **WORK SITE SAFETY FOR AERIAL EQUIPMENT**

Identify the most level grade from which to operate.

- The slope should not exceed 5 degrees unless the equipment is rated for steeper grades.
- Set Emergency Brake
- Position both wheel chocks place on both sides of the tire
- Engage Power Source
- Set barricades and cones around the vehicle
- If the operator will be working in a pedestrian area, then barricades, “Caution” tape or fencing shall be utilized. Cones are not permitted.
- Verify proper portable radio operation
- Discuss work with personnel on the ground. They should be made aware of the potential hazards and the risk of injury caused by falling objects such as tree limbs.
- Put on the required Fall Protection Equipment – remember additional Personal Protection may be necessary
- Maintain proper distance from electrical power lines

Do not operate the equipment if...

- Wind gusts exceed 30 mph; or
- If there is or could be an electrical storm.

Verify that the area under and around the work site is free of passers-by.

Check out overhead clearances, building design, fixtures and set-up.

## **TRAFFIC SAFETY AND CONE PLACEMENT**

Planning for traffic control is necessary on a case by case basis. Work that takes place either on or near the roadway creates a potentially hazardous situation, which shall require the use of traffic controls. It is the responsibility of the person in charge or their designee to establish and maintain safe and efficient controls.

All necessary traffic control devices shall be installed before work begins and must be maintained during the entire work period.

Traffic control devices (i.e. barricades, cones etc.) provide drivers with sufficient advanced warning, and provide proper protection for the motorists and our employees. In addition, they advise motorists of proper travel path.

When parked, a cone shall be placed at the rear of the vehicle when the truck will be backed up or out of spot, at the front of the vehicle when the truck will be driven forward.

## **SPECIAL HAZARDS**

**DANGER** – No equipment insulated or not, provides any electrical protection to the occupant of the platform if there is “phase to phase” or “phase to ground” contact. Such contact will cause serious injury or death. For lines rated 50 kV or below, minimum clearance between the lines and any part of the equipment or load shall be 10 feet.

**DANGER** – User / Operators are not permitted to use the lift to gain access to another level. Once in the bucket, you are required to remain until the platform is placed firmly back on the ground.

All aerial lifts shall be inspected before use. The attached Daily Aerial Lift Inspection (Attachments 8) form shall be used. The completed form shall be retained with the equipment until the end of each workday and at end of day, turned into the immediate supervisor.

# **ASSURED EQUIPMENT GROUNDING CONDUCTOR AND/OR GFCI PROGRAM**

## **POLICY**

It is the policy of BCI to take every reasonable precaution in the performance of work to protect the health and safety of employees and the public and to minimize the probability of damage to property. Elimination of injuries resulting from possible malfunctions, improper grounding and/or defective electrical tools shall be accomplished by strict use of Ground Fault Circuit Interrupters (GFCI's). An Assured Equipment Grounding Conductor Program (AEGCP) is useful to confirm and maintain proper ground on extension and power tool cords however it is not to be used as a substitute for GFCI's.

## **PROCEDURES**

It is the policy of BCI to follow the fundamental principles of safety, which are described below. A clear understanding of these principles will improve the safety of working with or around electrical equipment. Equipment that does not comply with the testing requirements of this program shall not be used by any employee. The Safety Department, designated as competent persons, are responsible for program execution.

Practice proper housekeeping and cleanliness. Poor housekeeping is a major factor in many accidents. A cluttered area is likely to be both unsafe and inefficient. Every employee is responsible for keeping a clean area and every supervisor is responsible for ensuring that his or her areas of responsibility remain clean.

## **WORKING WITH ENERGIZED EQUIPMENT**

This section contains safety requirements that must be met in constructing electrical equipment and in working on energized electrical equipment. Special emphasis is placed on problems associated with personnel working on hazardous electrical equipment in an energized condition. Such work is permissible, but only after extensive effort to perform the necessary tasks with the equipment in a securely de-energized condition has proven unsuccessful or if the equipment is so enclosed and protected that contact with hazardous voltages is essentially impossible. Also special care shall be taken when working with conductive materials and equipment such as long dimensional conductor objects (ducts or pipes). Employees who handle or may be working with such objects shall work with the Safety Department to determine if any additional steps for safe work practices need to be taken.

Safety related work practices that pertain to qualified and unqualified electrical workers are listed below.

- Employees who face a risk of electric shock but who are not qualified persons shall be trained & familiar with electrically related safety practices.
- Only qualified persons may work on electric circuit parts or equipment that has not been de-energized.
- Such persons shall be made familiar with the use of special precautionary techniques, PPE, insulating & shielding materials and insulated tools.
- Unqualified persons shall not be permitted to enter spaces that are required to be accessible to qualified employees only, unless the electric conductors and equipment involved are in an electrically safe work condition.

## **PROTECTIVE SYSTEMS/GFCI'S**

Equipment must be designed and constructed to provide personnel protection. First-line and backup safeguards should be provided to prevent personnel access to energized circuits. Periodic tests must be established to verify that these protective systems are operative. For all 120 volt 15 and 20 amp (branch) circuits that are cord/ plug connected, Ground Fault Circuit Interrupters (GFCI's) shall be used. GFCI's are specifically designed to protect workers, and work much faster than standard circuit breakers, and at extremely low amperage – far below the threshold at which a hazardous shock can occur. This is the primary protection, and therefore it is required that GFCI's be used as the first component in any circuit used for tools/ extension cords.

## **ASSURED EQUIPMENT GROUNDING CONDUCTOR PROGRAM (AEGCP)**

Secondary protection benefits may be realized from utilizing an Assured Equipment Grounding Conductor Program (AEGCP). This program provides for daily inspections of extension and power tool cords, and of the power tools themselves at the start of the work shift, and initial and periodic verification of ground continuity of all electrical power tool and extension cords. Tools and/or cords found to be defective shall be tagged and immediately taken out of service. If the AEGCP program is used, continuity checks are made initially and at three month intervals. Cords that are checked shall have distinguishable taped markings placed within one foot of the male end of the cord. This program is not, however mandatory if GFCI's are faithfully used - which is the company policy.

A written assured equipment grounding conductor program will be continuously enforced at the site by one or more designated persons to ensure that equipment grounding conductors for all cord sets, receptacles that are not a part of the permanent wiring of the building or structure, and equipment connected by cord and plug are installed and maintained in good, properly grounded condition.

The following tests shall be performed on all cord sets, receptacles that are not part of the permanent wiring of the building or structure, and cord- and plug-connected equipment required to be grounded.

- All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.
- Each receptacle and attachment plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.
- All required tests shall be performed,
- Before each use on site,
- When there is evidence of damage,
- Before equipment is returned to service following any repairs,
- At intervals not exceeding 3 months.

The tests required shall be recorded and made available to any authority having jurisdiction. A written description of the program including the specific procedures adopted by the employer, shall be available at the job site for inspection & copying by the Assistant Secretary & any affected employee.

## **SAFETY PRACTICES**

Because a wide range of power supplies exist, no one set of considerations can be applied to all cases. Employees shall be trained in the skills and techniques to: distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment, to determine the nominal voltage of exposed energized electrical conductors and circuit parts, the approach distances specified in Table 130.2 of NFPA 70E, and the decision making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely. Program elements might include: evaluations, anticipating unexpected events, all electrical parts are considered live until proven otherwise, work permits, electrical flash arc hazard analysis. The following classification scheme may be helpful in assessing power-supply hazards.

Power supplies of 50 volts or less with high current capability too often are not considered a shock hazard, although these voltages are capable of producing fatal shocks. Since they are not "high voltage," such power sources frequently are not treated with proper respect.

In addition to the obvious shock and burn hazards, there is also the likelihood of injuries incurred in trying to get away from the source of a shock. Cuts or bruises, and even serious and sometimes fatal falls, have resulted from otherwise insignificant shocks.

# **A WORKPLACE ACCIDENT AND INJURY REDUCTION (AWAIR PROGRAM)**

## **Policy Statement**

It is the policy of BCI Constructors, Inc. to provide a safe, healthy and productive work environment for all employees and to abide by all federal, state, and local regulations.

To make our approach to safety effective and uniform throughout the organization and to fulfill the requirements of the AWAIR Act, BCI has adopted the following Workplace Safety and Health Program. The goal of the Workplace Safety and Health Program is to reduce the frequency and severity of accidents and injuries, and make our company a safe and productive place to work. Accidents cost time and money, disrupt workflow, and seriously impact personal lives. All employees are responsible for following all rules and regulations pertaining to health and safety. Foremen and Superintendents are the primary enforcers of safety rules.

For this program to be successful, all employees must maintain a positive attitude towards accident and injury prevention. Working safely is a condition of employment at BCI. Failure to perform work in a safe manner, taking unnecessary risks, or endangering others is grounds for termination.

This program manual outlines the safety rules and regulations and contains examples of how to safely complete a variety of tasks. If you need additional information specific to your work site contact our Safety Department at 605-342-6966.

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Zane Brink, President

BCI

# INTRODUCTION TO A WORKPLACE ACCIDENT AND INJURY REDUCTION (AWAIR) ACT

In 1990, the State of Minnesota amended the Occupational Safety and Health Act, Minnesota Statutes Chapter 182, to require employers in certain industries to develop written, comprehensive workplace safety and health programs. This legislation, M.S. §182.653, subd. 8, is known as A Workplace Accident and Injury Reduction (AWAIR) Act and programs developed to comply with the act are known as AWAIR programs. The requirements of the act are as follows:

**Workplace programs.** An employer covered by this section must establish a written workplace accident and injury reduction program that promotes safe and healthful working conditions and is based on clearly stated goals and objectives for meeting those goals. The program must describe:

How managers, supervisors, and employees are responsible for implementing the program and how continued participation of management will be established, measured, and maintained;

- The methods used to identify, analyze, and control new or existing hazards, conditions, and operations;
- How the plan will be communicated to all affected employees so that they are informed of work-related hazards and controls;
  - How workplace accidents will be investigated and corrective action implemented; and
  - How safe work practices and rules will be enforced.

An employer must conduct and document a review of the workplace accident and injury reduction program at least annually and document how procedures set forth in the program are met. The contents of the BCI Safety and Health Program Manual meet the requirements of the AWAIR program.

## GOALS AND OBJECTIVES

Central to AWAIR programs are the goals and objectives BCI sets for its overall safety and health program. Goals establish the direction for the program and state what BCI wants to achieve through the program. Objectives are the specific actions that will be taken to attempt to achieve the goals.

### **GOAL 1: REDUCE OUR INJURY AND ILLNESS RATE BY 20%.**

Objectives:

- We will provide proper equipment and training necessary to safely complete all job tasks.
- To promptly correct items identified as unsafe.
- Ensure completion of monthly jobsite inspections at every location.
- Investigate all incidents and implement corrective action within 24 hrs.

### **GOAL 2: LOWER INSURANCE PREMIUMS BY 15%.**

Objectives:

- Fulfill requirements for state-specific incentive programs.
- Maintain qualifications for PICS and other consortium groups.
- Reduce frequency and severity of general and auto liability claims.

### **GOAL 3: COMPLY TO OSHA STANDARDS**

Objectives:

- Enforce completion of equipment checklists and inspections at every jobsite.
- Increase frequency of employee training.
- Educate field employees and management in OSHA requirements and standards.
- Ensure regular audits of facilities are completed.

### **GOAL 4: ENHANCE SAFETY AWARENESS THROUGHOUT BRINK CONSTRUCTORS**

Objectives:

- Continue to integrate safety in to all company functions.
- Safety subjects will be presented at weekly management meeting.
- Create Safety and Health Committee.
- Safety subjects will be included at Foreman and Quarterly meetings
- Include cost of injuries and property damage in Company newsletter.
- Develop monthly “Report Card” of safety performance.

## **ROLES AND RESPONSIBILITIES**

This section of the BCI Manual outlines the responsibilities of everyone involved in the safety process. This section defines how managers, supervisors, and employees are responsible for implementing the program and how continued participation of management will be established, measured, and maintained.

### **MANAGEMENT**

The management team of BCI must demonstrate a positive attitude towards the objective of reducing personal injury and property damage and achieving the standards set forth in our Workplace Safety and Health Program. To aid in the realization of a strong Workplace Safety and Health Program, management will do the following:

- Provide the resources to create a safe work environment for all employees.
- Make the necessary appropriations to meet the requirements of an effective Workplace Safety and Health Program.
- Include the discussion of safety issues at staff meetings and other appropriate occasions.
- Carry out and enforce the Workplace Safety and Health Program.
- Direct special safety activities, such as award programs.
- Assure development of policies and programs to meet the legal requirements of the Federal Occupational Safety and Health Act and applicable state/local regulations.
- Use personal protective equipment where necessary, obey all applicable safety rules, and demand the same of all BCI employees.
- Delegate responsibility for safety to front-line supervisory personnel and annually review their progress in this area.

## **PROJECT MANAGER**

The Project Manager is responsible for the implementation and enforcement of the Workplace Safety and Health Program at the jobsites. The project manager has the following responsibilities:

- Forwards concerns about complying with any federal, state, local, and BCI regulations to the Safety Department.
- Communicate jobsite safety standards to Superintendent/Foreman.
- Give due consideration to safety factors during project planning, involving the Safety Department with any unique or unusual safety problems.
- Obtain required documentation pertaining to hazards on job site including lead, asbestos, utilities, confined space (Attachments 12, 13 & 14), traffic control or any jobsite unique hazard.
- Ensure tasks that affect safety are budgeted for and scheduled for completion in a timely manner.
- Assure that all information on accidents involving BCI employees or property is forwarded to the Safety Department.
- Require subcontractors to abide by our Workplace Safety and Health Program.
- Conduct visual safety inspections on the job when onsite.
- Consult with the Safety Department during jobsite surveys to review and evaluate any problems or recommendations.
- Undertake prompt corrective action on any safety recommendation. If any unsafe condition is out of the control of the Company, give written notification of the unsafe condition to the owner/general contractor.
- Request MSDS sheet when ordering material

## **SUPERINTENDENT AND FOREMAN**

The supervisor is a direct representative of management, and therefore, they interpret the safety attitude of the individual Superintendent/Foreman as that of the Company.

Our Workplace Safety and Health Program operates on the basis that accident prevention is essential for an efficient operation. Superintendents/foremen, therefore, will be held accountable for the accidents that occur on their jobsites. They shall have a thorough knowledge of the job hazards, and how these hazards can be minimized. Responsibilities of the Superintendent/Foreman are as follows:

Ensure that each jobsite has the following:

- Fire extinguishers
- First-aid kit
- Emergency phone number sign
- Workplace Safety and Health Program Book and required forms:
- Accident Investigation Reports
- Jobsite Inspection Checklists
- MSDS/SDS Binders
- Toolbox Talks
- Maintain an attitude that safety is important.
- Maintain accountability of all employees on the job site assigned to them.
- Notify the Safety Department immediately of *any* accident or injury.
- Ensure first report of injury are completed and forwarded to office within 24 hours of injury.
- Carry out and enforce the Workplace Safety and Health Program.
- Comply with federal, state, and local safety regulations.
- Assure that all necessary personal protective equipment is maintained and used correctly.



- Instruct all employees under their supervision in safe working procedures and job safety requirements.
- Conduct periodic safety inspections of project jobsites for recognition and correction of safety hazards.
- Correct unsafe work habits as soon as possible.
- Correct unsafe conditions detected in their work area as soon as possible. If the condition is out of the control of the Superintendent/Foreman, notify the Project Manager and the Safety Department immediately.
- In the event of an accident, provide immediate care for the injured employee. In the event of a serious injury, call 911.
- Participate in the investigation of all accidents and correct the cause of the accident immediately.
- Assure that machinery, equipment and tools are maintained in a safe working condition and operated properly. Require equipment operators to inspect their equipment on a daily use basis.
- Maintain good housekeeping at all times.
- Conduct weekly toolbox sessions with the employees under their supervision and turn the training roster into the Safety Department.
- Maintain Safety Data Sheets for all hazardous materials being used on the jobsite. Forward copies of new SDS to the Safety Department.
- Distribute appropriate personal protective equipment and ensure enforcement regarding the use of same.

## **EMPLOYEES**

Employees are reminded that safety is an integral part of the operations of BCI. With this in mind, each employee shall observe all safety rules and regulations. Employees' safety responsibilities are as follows:

- Observe and comply with the Workplace Safety and Health Program and all applicable federal, state, and local safety regulations.
- Work safely in such a manner as to ensure your own safety, as well as that of co-workers and others.
- Request assistance when unsure about how to perform any task safely.
- Correct unsafe acts or conditions within the scope of your position.
- Report all unsafe acts or conditions to the Superintendent/Foreman regardless of the origin of the unsafe act or condition.
- Use and maintain all safety devices and personnel protective equipment provided.
- Report all accidents to the Superintendent/Foreman immediately, regardless of the seriousness.
- Actively participate in safety activities such as weekly toolbox meetings, safety meetings (Attachments 10) and other related training.
- Read and understand all rules within the Workplace Safety and Health Program.
- Report ideas for improving our jobsite safety.
- Refuse to conduct unsafe or unlawful acts or work in unsafe conditions.

## **SUBCONTRACTORS**

Because subcontractors of the Company act as independent contractors, it is their responsibility to comply with the applicable federal, state, and local safety regulations. However, it is our responsibility to monitor their safety activities. This is done not with the intention of dictating the safety program of our subcontractors, but rather to provide for the well-being of all parties involved on our projects. The Company will require the following:

All subcontractors of BCI must cooperate and comply with the established loss prevention activities so as not to create hazards or conditions which could result in injury to our employees.

Every subcontractor must furnish their own safety equipment to their individual employees.

Every subcontractor must have their own workplace safety program.

The Company's subcontract agreement must be executed prior to the subcontractor commencing activities at the jobsite.

Failure to comply with the above may result in the cancellation of the contract.

## **SAFETY AND HEALTH COMMITTEE**

Responsibilities:

- Observe and influence safety behavior on their jobsite.
- Solicit fellow workers' safety suggestions and concerns.
- Review accidents and recommend corrective action.
- Review accident statistics to identify possible trends and to evaluate program performance.
- Discuss possible new methods of accident prevention.
- Pursue safety education through films, demonstrations, videos, training, etc.
- Develop and revise company policies and procedures to comply with all safety regulations (federal, state, and local).
- Discuss and review trends in personal protective equipment.
- Develop incentives to improve safety awareness.

## **SAFETY OFFICER**

The Safety Department is responsible for the development and implementation of a thorough, practical, and effective Workplace Safety and Health Program. The Safety Department has the following responsibilities:

- Develop and implement safety policies and procedures designed to assure compliance with the rules and regulations of federal, state, and local regulatory agencies. Provide uniform direction of accepted safety practices throughout the corporation.
- Manage the administration of the Workplace Safety and Health Program, and coordinate all safety activities as a representative of management.
- Develop and coordinate employee safety training programs.
- Monitor the performance of the safety program to be aware of trends, potential problems, predominant loss types and overall progress of the program. Assist management with solving persistent accident problems and other non-routine safety difficulties.
- Consult with safety representatives of insurance companies to coordinate their services with the Company's Workplace Safety and Health Program.
- Direct the investigation of all accidents, and if necessary, visit the scene of the accident to assure that measures are undertaken to prevent their reoccurrence.
- Supervise the completion of necessary accident records. Assure prompt filing of required reports with the

insurance carrier, state and/or local authorities.

- Monitor medical reports and progress with employee and workers' compensation carrier, and make recommendations on an early return to work program or appropriate alternative actions.
- Manage return to work program.
- Be familiar with applicable safety codes and construction industry safety standards.
- Establish and maintain a recordkeeping system that meets all regulatory requirements.
- Keep abreast of current information regarding OSHA regulations.
- Assist in the procurement and distribution of appropriate personal protective equipment and ensure enforcement regarding the use of same.
- Ensure that properly maintained and inspected tools, machinery, or equipment are provided to our projects.
- Conduct periodic safety inspections of project jobsites for recognition and correction of safety hazards.
- Review and advise personnel on new equipment, procedures, or operations as they relate to the prevention and control of accidents.
- Provide leadership to the Safety and Health Committee.
- Assure that new employees receive proper orientation ensuring consistency of information to all new employees regarding safety policies, procedures, and related information.
- Maintain a library of reference manuals and materials.
- Attend risk control workshops and pursue continuing education.
- Investigate and resolve OSHA citations.

## **HAZARD IDENTIFICATION, ANALYSIS AND CONTROL**

### **PRE-JOB PLANNING**

The Project Manager will identify and plan for any hazards or exposures that may occur during the course of construction. The following items shall be considered by the Project Manager and Superintendent in planning for the project.

- Consideration of Owner, Company and federal, state, and local safety requirements.
- Hazards involving Company employees, equipment and materials:
  - Personal protective equipment.
  - Preventative maintenance of special equipment.
  - Material storage and handling.
  - Fire prevention and firefighting equipment.
  - Ladders and scaffolds.
  - First aid and medical services.
  - Vehicular traffic patterns.
  - Trenching and shoring.
  - Temporary electrical power.
- Hazards involving members of the public and their property:
  - Public vehicular traffic exposures need for signs, barricades and flagmen.
  - Public pedestrians and children need for temporary walkways, overhead protection, securing equipment and fencing.
  - Railroads notification to railroads of our operations, securing train schedules, flagmen, warning signals and special insurance.
  - Utilities (underground and overhead) locating and marking, de-energizing or moving lines, shoring and blocking and special insurance.
- Hazards involving licensed vehicle operations:

- Traffic exposure, detours, barricading and load limits.
- State/local regulations and license and permit requirements.
- Preventative maintenance.
- Hiring and verifying driver abilities and references.
- Hazards involving subcontractors:
- Procedures for assuring subcontractor compliance with BCI's Workplace Safety and Health Program.
- Verification of subcontractor compliance with BCI's insurance requirements.
- Order safety equipment and supplies to arrive ahead of need.
- Inform employees of:
  - Any operations in their work area where hazardous materials are present.
  - The jobsite emergency action plan and specific evacuation procedures.
  - The location and availability of the written safety programs.
  - Training employees on jobsite-specific hazards.
- Ensure only employees deemed as "qualified and competent" by training or experience are allowed to operate the following and that documentation is completed.
- Mobile Equipment
- Hand and power tools
- Powder-actuated tools
- Any motorized machinery or equipment
- Training employees on the Hazard Communication Program (Attachment 20):
  - An explanation of chemical labeling.
  - How employees can obtain and use the appropriate hazard information (by reading the label).
  - The place(s) on the jobsite where the hazardous materials are used and stored.
  - The physical and health hazards of the hazardous materials.
  - Methods and observations that may be used to detect the presence or release of a hazardous material in the work area, (e.g. visual appearance, odor, etc.)
  - The measures employees can take to protect themselves from exposure to hazardous materials. Include the appropriate work practices, protective equipment, and usual emergency procedures in this training.
  - Emergency procedures to be followed for spills, fire, disposal, and first aid.
  - Request SDS Sheets when ordering chemicals

## **SAFETY INSPECTIONS**

Regular inspections of the jobsite and equipment are a responsibility shared by all employees. Jobsite inspections are an essential part of the Company's Workplace Safety and Health Program and are used to identify hazards and determine the necessary safeguards to eliminate those hazards.

## **SITE INSPECTIONS**

Jobsite inspections should focus on unsafe physical conditions and unsafe work practices. Jobsite inspections are not conducted to find out how many things are wrong, but rather to determine if everything is satisfactory. Frequently, employees are able to point out unsafe conditions that may otherwise go unnoticed. When such suggestions are acted upon and proper safeguards implemented, the employees realize that they have contributed to not only their own safety, but also to that of their fellow workers.

The Jobsite Inspection Checklist can be used to assist in identifying potential hazards in the work area. The jobsite inspection is of no value unless immediate action is taken to eliminate or control the identified unsafe condition or correct the unsafe act that was taking place.

If any unsafe conditions that are identified are out of the control of BCI the Project Manager or Superintendent/Foreman shall notify the owner/general contractor of the unsafe condition.

## **PREVENTATIVE MAINTENANCE INSPECTIONS**

The periodic inspection of equipment is necessary to provide an efficient and safe jobsite. Regular inspection and proper preventive maintenance on each unit will provide adequate lead time to repair or replace worn components without delaying the project.

Inspection of major equipment prior to its daily use is essential in identifying the potential hazards to both equipment and workers. The availability of equipment will be maximized through appropriate preventive maintenance inspections. Daily visual inspections are required to be performed by the operators. Any defects found on equipment shall be noted on an equipment inspection/repair form and returned to the shop for repair.

Shop personnel are responsible for inspecting equipment and making necessary repairs or replacement prior to sending it back to the field.

## **COMMUNICATION**

### **SAFETY MEETINGS**

In order for employees to work safely and comply with the Workplace Safety and Health Program, they need to know what is expected of them. Since it is impossible to maintain close contact with every individual on the job, the use of safety meetings becomes one of the most practical and efficient methods of maintaining safety awareness.

In addition, the continued monitoring by the Safety Department is designed to further communicate BCI's commitment to safety, and the procedures and policies which must be carried out.

## **TOOLBOX MEETINGS**

"Toolbox" meetings will be held by the jobsite Superintendent/Foreman on a weekly basis for all individuals under his or her supervision. The proceedings of this meeting, along with the names of employees in attendance, must be recorded on the toolbox meeting record.

The Superintendent/Foreman will communicate general topics for discussion or can request job-specific safety talks from the Safety Department. However, the superintendent/foreman is not limited to the set topic. Additional items that should be discussed include:

- Accidents that have occurred on the jobsite or elsewhere that have application to type of work being performed and the methods that have been implemented to prevent recurrence.
- Anticipated hazards in the forthcoming week and the methods of control.
- Items of special safety interest or safety bulletins supplied periodically by the Safety Department.
- Items being discussed/addressed by the company's Safety and Health Committee.

A copy of the toolbox meeting record must be sent to the Safety Department. The Safety Department will monitor receipt of toolbox meeting records and file accordingly.

## **COMPANY QUARTERLY SAFETY MEETING**

We are committed to efficient and quality training which increases safety awareness amongst all employees.

Safety meetings for all employees will be held once a quarter. Possible agenda items include but are not limited to the review of accidents, safety education, safety inspections, elimination of workplace hazards, new methods of improving job performance, employee training, personal protective equipment, safety incentives, Hazard Communication, Lockout/Tag out, Respiratory Protection, fall protection, and other safety policies.

It is vital to this Workplace Safety and Health Program that all safety training and meetings are carefully documented. Written records of all training activities are the responsibility of the Safety Department.

The Safety Department will provide and or conduct the following:

- Safety articles and subject mailings with payroll
- Occasional safety subjects will be mailed with payroll.
- Job Site Visits
- Subject of safety nature will be discussed by management during various jobsite visits.

## **OSHA RECORD KEEPING**

The OSHA 300 Log will be maintained by the Safety Department. The purpose of this form is to provide information measuring the Company's accident record. This form is usually reviewed by an OSHA compliance officer during an inspection.

The OSHA 300 Log is to be kept on a calendar-year basis. On December 31, the OSHA 300 Log should be totaled and signed by the Company President. The completed OSHA 300 Log is to be posted at jobsite trailer of jobs that have 6 months or greater duration and at the corporate headquarters in Rapid City, SD no later than February 1 of the following calendar year. On April 1, the form can be taken down and permanently filed.

## **NEW EMPLOYEE ORIENTATION**

Safety orientation for an employee is one of the most important phases of BCI's Workplace Safety and Health Program. In order to accomplish this, supervisory personnel must advise the employee of BCI's Workplace Safety and Health Program.

## ACCIDENT INVESTIGATION

A properly conducted accident investigation (Attachments 6 & 7) will be of great assistance in preventing the recurrence of a similar accident.

The objective of accident investigation must be to reach one goal: Find the "cause" of an accident. To do this, accident investigations must be "fact finding" not "fault finding." Once the "cause" is determined, the corrective action necessary is usually quite obvious.

Remember, if an unsafe condition or action is known to exist and corrective steps are not undertaken, the second mistake has already been made.

An accident is defined as:

- An unintended event that **caused or could have caused** (near miss) bodily injury or property damage.

Please note that this definition includes "near misses" that do not result in injury or damage. These too must be investigated.

In the event of an "accident" or "near miss":

- If the injured person has a serious injury, has lost consciousness, or has any serious medical emergency, call 911 and request an ambulance and then call BCIs' Rapid City office at 605-342-6966 or Safety Officers at 605-390-5789 or 605-939-4908.
- If there is an injured person, administer first aid.
- If the injured person requires non-emergency medical treatment, contact BCIs' Rapid City office at 605-342-6966 or Safety Officers at 605-390-5789 or 605-939-4908.
- If the injured person requires emergency treatment, transport to the nearest emergency room and follow Company contact instructions listed above.
- The investigation must begin immediately after the occurrence of the accident and any injured person has been treated.
- The accident or near miss investigation (Attachment 4) must be made by the Superintendent/Foreman in charge of the injured employee or having responsibility for the property that was damaged.
- If the accident resulted in a serious injury or property loss, preserve the accident scene without moving evidence. Contact the Safety Department. If necessary take photographs before evidence is disturbed.
- The Superintendent/Foreman conducting the investigation shall record the results on the appropriate Company Accident/Injury Investigation form. The Safety Department will assist with the investigation if requested or deemed necessary.
- The report shall indicate the corrective action that has been taken or is being recommended to prevent future recurrences.
- When conducting the investigation, the purpose is not to place blame, but rather to find the root cause of the accident and prevent a similar accident in the future.

The actual investigation must proceed as follows:

- If possible, discuss the accident with the injured employee.
- Question other employees who may have witnessed the accident.
- Take into consideration the following factors:
  - What was the employee doing just prior to and at the time of the accident?
  - Was this in pursuit of the employee's regular duties?
  - Was the employee properly instructed as to the manner in which to perform the duties?
  - Did the employee follow instructions?
  - Were other employees involved in the accident?
  - Was the equipment or machinery the employee was using in good condition?
  - Was the equipment properly guarded?
  - Was the equipment suited for the purpose for which it was used? Was the work area adequately lighted?
  - Were proper housekeeping conditions maintained?
  - How was the same work done by other employees?
  - Is there a safer way in which the work could be accomplished?
  - Was the employee in good health when reporting to work on the day of the accident?
  - If an unsafe condition was involved, determine what changes can be made to prevent a similar recurrence.

The Accident/Injury Investigation form must be sent to the Safety Department as soon as possible, and no later than 24 hours after the accident.

All investigation forms will be reviewed by the Safety Department to assure that a complete investigation has been made, accident cause determined and corrective action taken.

In the event of any accident or injury, only the Company President is authorized to make any statements to the media.

## **ENFORCEMENT OF SAFETY AND HEALTH PROGRAMS**

### **ENFORCEMENT PROCEDURES**

#### **Policy**

For this program to be successful, all employees must maintain a positive attitude towards accident and injury prevention.

Your health and welfare are most important. It is the responsibility of management and first line supervisors to actively enforce the Workplace Safety and Health Program. Working safely is a condition of employment at BCI. Failure to perform work in a safe manner, taking unnecessary risks, or endangering others may be grounds for termination. Violations of safety rules are considered unsatisfactory job performance and will be treated accordingly. Any employee who violates the policies and procedures as outlined in the Workplace Safety and Health Program will be subject to the following disciplinary action.

- **First violation:** Oral warning; notation for personnel file.
- **Second violation:** Written warning; copy for personnel file.
- **Third violation:** Written warning; one day suspension without pay.
- **Fourth violation:** Written warning and one-week suspension, or termination.



**Zero-tolerance Violations:** Some safety violations are of such serious nature that there will be no warnings and termination may result. Examples include:

- Entering hazardous confined spaces (Attachments 12, 13 & 14) without following proper procedures,
- Failing to use fall protection equipment,
- Entering unsafe excavations.
- Both the employee and the supervisor allowing these unsafe acts may be terminated. A record will be maintained of all disciplinary actions.

## PROGRAM REVIEW

The AWAIR Act requires employers to review the entire program at least annually and document the findings. Program review is vital, because it serves as a check to see if the organization is making progress towards its goal of creating a safer, healthier workplace for all employees. The second reason for conducting a review or audit of the workplace safety and health program is to determine whether the procedures used at the jobsite or facility are consistent with those described in the program and if they are effective.

The primary focus of the evaluation effort should be whether the organization has made progress in achieving the AWAIR program's goals and objectives within the past year and, if so, whether the progress made actually improved worker safety and health.

The first step in a program evaluation should be a review of the documentation created during the past year, relevant to the Workplace Safety and Health Program. One of the first documents that should be reviewed is the facility's *Log of Work-Related Injuries and Illnesses*, also known as the OSHA 300 log. The log and the accompanying *First Report of Injury* forms should be examined for trends, such as similar injuries to those workers with similar job duties, similar causes of injuries and illnesses, or departments with higher than average injury rates. Accident investigation (Attachments 6 & 7) reports should also be reviewed. If similar accidents or near misses continue to occur, perhaps the root causes of the events are not being determined during the investigation or corrective action is not being implemented. Reports from safety committee or supervisor inspections or walk-around should be reviewed as well. If the hazards causing injury or illness in the workplace are not being identified through these inspections, then efforts should be made to assist the individuals to improve the process. Possibilities include additional training about hazard recognition, technical assistance from an OSHA safety consultant, insurance loss-control specialist or private consultant, or the allotment of more time for more extensive or frequent inspections. Corrective actions resulting from hazards identified during accident investigations or routine inspections should be taken as soon as possible. Specific written programs, such as Employee Right-To-Know and Respiratory Protection, should also be reviewed for completeness and accuracy.

Employee and supervisor interviews are the next step. These can be formally conducted or simply a casual conversation as part of an inspection or walk-around. Employees should be selected at random. Contractor employees, if present, should be interviewed as well. Some of the questions that should be asked include:

- What are some of the hazards involved with your job? How do you protect yourself from them?
- Are written operating procedures correct? Do you follow them as written? Describe the safety precautions that you follow.
- What are your responsibilities for workplace safety?
- Do you know what the organization's goals are for workplace safety and health? What are they?
- What are the chemicals that you work with? What are some of the possible health effects if you are overexposed to them?
- Do you have any specific safety and health concerns? What are they?
- Do you know how to report a safety hazard so that it can be corrected? How?

- Are safety hazards corrected when you point them out to your supervisor or manager? If not, why not?
- Do you know how to evacuate the area in case of fire or other emergency? What are your escape routes?
- Do you know where to go to get replacements for worn or dirty personal protective equipment? Where?
- How are safety rules enforced?

After the evaluation process is completed, the AWAIR program and other safety and health programs should be updated to correct shortfalls, to assure the written programs reflect the real procedures used in the organization and to set new goals for the organization to achieve in a timely manner. Finally, changes to the program, goals and procedures need to be communicated to everyone in the organization.

## **SAFETY COMMITTEES**

The Safety and Health Committee is comprised of management, field and office employees. The team will meet at 6 week intervals. Items discussed will be documented and communicated to all supervisory personnel.

Superintendents/foremen are responsible for reviewing these items in conjunction with the weekly toolbox meetings.

## **MISSION STATEMENT**

To help create and maintain a safe working environment for all employees. To act as representatives of all Company employees. To aid and advise employees on matters of safety and health which pertain to Company operations.

## **GOALS**

- To reduce the frequency and severity of accidents and injuries.
- To educate employees on proper safety practices.
- To keep BCI an industry leader in safety.

## **RESPONSIBILITIES**

- Observe and influence safety behavior on their jobsite.
- Solicit fellow workers' safety suggestions and concerns.
- Review accidents and recommend corrective action.
- Review accident statistics to identify possible trends and to evaluate program performance.
- Discuss possible new methods of accident prevention.
- Pursue safety education through films, demonstrations, videos, training, etc.
- Develop and revise company policies and procedures to comply with all safety regulations (federal, state, and local).
- Discuss and review trends in personal protective equipment.
- Develop incentives to improve safety awareness.
- Discuss and review progress of the Safety and Health Committee

# **BLOODBORNE PATHOGENS PROGRAM**

This program is for all employees of BCI who may possibly be exposed to blood or body fluids in the conduct of their job. This infection control plan complies with OSHA requirement, 29 CFR 1910.1030, Bloodborne Pathogens. The plan includes requirements for personal protective equipment, housekeeping, training, and a procedure for reporting exposures. BCI shall ensure that all employees with occupational exposure participate in a training program. If BCI determines that it has employees with occupational exposure as defined in 1910.1030(b), then the Safety Department shall prepare an exposure determination. The exposure determination shall be made without regards to the use of personal protective equipment.

## **RESPONSIBILITIES**

If a need for an Exposure Control Plan is determined, the Safety Department will handle the Bloodborne Pathogen Program and maintain records of any training and/ or inspections required. The Safety Department shall ensure that a copy of the Exposure Control Plan is accessible to employees in accordance with 29 CFR 1910.1020(e). This plan has detailed steps to take in the event of an exposure incident. PPE requirements are listed in the plan. For instance, employees of BCI who have been trained in First Aid and are expected to provide emergency care would be expected to have exposure.

## **DEFINITIONS**

**Biological Hazard:** The term biological hazard or biohazard is taken to mean any viable infectious agent that presents a risk, or a potential risk, to the well-being of humans.

**Medical Wastes/Infectious Wastes:** All waste emanating from human or animal tissues, blood or blood products or fluids. This includes used first aid bandages, syringes, needles, sharps, material used in spill cleanup and contaminated PPE or clothing.

**Universal Precautions:** Refers to a system of infectious disease control that assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All infectious/medical material must be handled according to Universal Precautions.

## **HAZARDS**

Unprotected exposure to body fluids presents the possible risk of infection from a number of bloodborne pathogens notably Hepatitis and HIV.

## **HAZARD CONTROL**

**Engineering Controls** - prevention of exposure to bloodborne pathogens engineering controls include proper storage facilities and containers and disinfectant equipment. Work practice controls shall be used to eliminate or minimize worker exposure.

**Administrative Controls** - prevention of exposure to bloodborne pathogen administrative controls include universal precautions, assignment of PPE, employee training, use of spill kits specifically designed for blood and body fluids and waste disposal procedures. Under circumstances in which differential between body fluids is difficult or impossible, all body fluids will be considered potentially infectious.

## **REPORTING AND RECORD KEEPING**

Any reports required by OSHA will be maintained by the Safety Department. All reports (Training Certificates, Notice of HBV Vaccinations, exposure reports) will be maintained for 30 years. Occupationally contracted HBV or HIV will be recorded on the OSHA 300 Log of Occupational Injuries and Illnesses as an illness. Exposures to blood-borne pathogens from contact with sharps will be recorded on the OSHA 300 Log of Occupational Injuries and Illnesses if treatment such as gamma globulin, hepatitis B immune globulin or hepatitis B vaccine is prescribed by a Physician.

## **TRAINING**

All personnel assigned duties as first responders, or custodial Employees (if deemed at risk of exposure in the cleaning of rest rooms, etc.) will receive initial and annual training by a qualified medical practitioner on the Bloodborne Pathogen Program. Additionally, personnel trained in First Aid shall be offered this annual training. All new and current affected Employees will be trained initially and annually thereafter. The content of the training program will include:

Documentation of training shall be done by the Safety Department or designated representative. The Safety Department shall establish and maintain an accurate record for each employee with occupational exposure in accordance with CFR 1910.1020.

- Training records will include the following:
- Dates and Contents of Training
- Names and Job Titles of persons attending.

Training records shall be maintained for 3 years from the date of training and medical records shall be maintained for at least the duration of employment plus 30 years.

BCI shall ensure that all records required by this section shall be made available upon request of employees, Assistant Secretary (OSHA) & the Director for examination & copying. Medical records must have written consent of employee before released. BCI shall comply with the requirements involving transfer of records in accordance with 29 CFR 1910.1020(h).

All Employees not affected by this Program will receive an overview of the program requirements during scheduled department Safety Meetings with documentation by Safety Meeting Minutes Form.

## **HEPATITIS-B VIRUS (HBV) VACCINATIONS**

Those workers required to provide first aid or emergency response duties on a routine basis will be offered Hepatitis-B Virus (HBV) Vaccinations at BCI's expense. Employees that transfer to a job or their job is reclassified to include exposure to blood-borne pathogens will be offered HBV Vaccinations within 10 working days of the transfer or reclassification.

The choice for HBV vaccination is not mandatory. If an affected Employee chooses not to have the vaccination at the initial offering, they will have the opportunity to be vaccinated when they are ready. The Safety Department will document the offer, acceptance or declination, and vaccination dates.

## **POST EXPOSURE TREATMENT AND NOTIFICATION PROCEDURES**

Should an affected Employee or an Employee acting as a "Good Samaritan" be occupationally exposed to HIV/HAV/HBV the affected Employee will report the exposure to the Safety Department and the Department will provide for the Employee to be tested for HIV/HAV/HBV at BCI's expense.

Following the initial blood test at time of exposure, the Employees will be retested at 6 weeks, 12 weeks and 6 months to determine if transmission has occurred. During this period, the Employee will follow the recommendations provided by the Physician or the U. S. Public Health Service.

An "occupational exposure" is defined as blood or body fluid contact from an injured or ill Employee to an open wound, or mucous membrane of the affected Employee, or an injury by a contaminated sharp object. Following the report of exposure, the Safety Department will contact the exposure source and request that person be tested for HIV/HAV/HBV at BCI's expense. The request is not mandatory and if refused will not effect that Employee's future employment. The source individual's blood is tested as soon as possible and after consent is obtained to determine HBV and HIV infectivity. (Hepatitis B surface Antigen, Hepatitis C Antibody and HIV Screen)

The exposed employee's blood shall be collected as soon as feasible and tested for HBV (Hepatitis B Antibody, Hepatitis C Antibody) and HIV serological status after consent is obtained (Employee Consent for HIV Antibody Testing).

During all phases of Post Exposure, the confidentiality of the affected Employee and exposure source will be maintained on a "need to know basis". The results of any HIV/HAV/HBV tests conducted will be provided to the exposed and source Employees within 5 business days of receipt.

## **GENERAL PROCEDURES**

Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a potential for exposure to any health hazard. Food and drink must not be stored in refrigerators, freezers, or cabinets where blood or other potentially infectious material is stored or in other areas of possible contamination.

Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used in the following circumstances:

- When the employee has cuts, abraded skin, chapped hands, dermatitis, or similar conditions.
- When examining abraded or non-intact skin of a patient with active bleeding.
- While handling blood or blood products or other body secretions.

Employees must wash their hands immediately, or as soon as possible, after removal of gloves or other personal protective equipment and after hand contact with blood or other potentially infectious materials. If hand washing facilities are not feasible, BCI shall provide either an appropriate antiseptic hand cleanser in conjunction with cloth/paper towels or antiseptic towelettes.

All personal protective equipment must be removed immediately upon leaving the work area, and if this equipment is overtly contaminated, it must be placed in an appropriate area or container for storage, washing, decontamination, or disposal.

Contaminated clothing must not be worn in clean areas or outside the building.

All procedures involving blood or other potentially infectious agents must be performed in a manner that will minimize splashing, spraying, and aerosolization.

## **MEDICAL WASTES**

Medical/infectious waste must be segregated from other waste at the point of origin.

Medical/infectious waste, except for sharps (i.e., razor blades, broken glass, needles, etc.) capable of puncturing or cutting, must be contained in double disposable red bags conspicuously labeled with the words "INFECTIOUS WASTE" and "BIOHAZARD."

Used needles or other sharps (razor blades, broken glass, scalpels, etc.) must not be sheared, bent, broken, recapped, or resheathed.

Infectious sharps must be contained for disposal in leak-proof, rigid puncture-resistant containers. Infectious waste contained as described above must be placed in reusable or disposable leak-proof bins or barrels that are conspicuously labeled with the words "INFECTIOUS WASTE" and "BIOHAZARD." These waste barrels are picked up regularly by an outside company licensed to handle infectious wastes.

All infectious agents, equipment, or apparatus must be disinfected in an autoclave or otherwise disinfected before being washed or disposed of. Each individual working with infectious bio-hazardous agents is responsible for disinfection and disposal of these agents.

Biological wastes that do not contain radioactive or hazardous substances may be disinfected by steam sterilization (autoclave) then disposed of in the regular trash.

Liquid bio-hazardous waste may be disposed of in the sewage system following chemical decontamination.

Reusable glassware must be decontaminated in sodium hypo chlorite (household bleach) solution (1:9) prior to rinsing and acid washing. The glassware must then be sterilized in an autoclave.

## **CUTS**

If an employee has a needle stick, cut, or mucous membrane exposure to another person's body fluids he/she must report the incident immediately.

## **BLOOD EXPOSURE**

All employees exposed to human blood and blood products must report to the Safety Department for information and possible inclusion in the Hepatitis B Immunization Program.

## **INFECTION CONTROL PLAN**

The purpose of the Infection Control Plan is to protect the health and safety of the persons directly involved in handling the materials, workers and the general public by ensuring the safe handling, storage, use, processing, and disposal of infectious medical waste. This plan complies with OSHA requirement proposed for 29 CFR 1910.1030, Bloodborne Pathogens.

Universal precautions: Refers to a system of infectious disease control which assumes that every direct contact with body fluids is infectious and requires every employee exposed to be protected as though such body fluids were infected with blood-borne pathogens. All infectious/medical material must be handled according to Universal Precautions (OSHA Instruction CPL 2-2.44A).

The following universal precautions must be taken.

- Gloves must be made of appropriate disposable material, usually intact latex or vinyl. They must be used:
- When the employee has cuts, abraded skin, chapped hands, dermatitis, or the like.
- When examining abraded or non-intact skin of a victim with active bleeding.
- While handling blood or blood products or other body secretions.
- Gowns, aprons, or lab coats must be worn when splashes of body fluid on skin or clothing are possible.
- Mask and eye protection are required when contact of mucosal membranes (eyes, mouth or nose) with body fluids is likely to occur (e.g. splashes or aerosolization).
- Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth contact.

## **WASTE DISPOSAL PLAN**

Medical/Infectious waste must be segregated from other waste at the point of origin.

Medical/Infectious waste, except for sharps (e.g. razor blades, broken glass, needles, etc.) capable of puncturing or cutting must be contained in double disposable red bags conspicuously labeled with the words, "INFECTIOUS WASTE -- BIOHAZARD."

Infectious sharps must be contained for disposal in leak-proof, rigid puncture resistant containers.

Infectious waste thus contained as described in procedures 2 and 3 above must be placed in reusable or disposable leak-proof bins or barrels which must be conspicuously labeled with the words, "INFECTIOUS WASTE -- BIOHAZARD."

These waste barrels are to be picked up regularly by an outside company licensed to handle infectious wastes.

Spills/Disinfectants: a solution of sodium hypochlorite (household bleach) diluted 1:9 with water must be used to disinfect, following initial cleanup of a spill with a chemical germicide approved as a hospital disinfectant. Spills on equipment or surfaces must be cleaned up immediately.

After removing gloves, and/or after contact with body fluids, hands and other skin surfaces must be washed thoroughly and immediately with soap or other disinfectant in hot water.

Other biological wastes that do not contain radioactive or hazardous substances may be disinfected by steam sterilization (autoclave) and then disposed of in the regular trash.

Liquid biohazard waste may be disposed of in the sewage system following chemical decontamination.

Reusable glassware must be decontaminated in sodium hypochlorite (household bleach) solution (1:9) prior to rinsing and acid washing. Then the glassware must be sterilized in an autoclave.

## **PERSONAL PROTECTIVE EQUIPMENT FOR WORKER PROTECTION**

Gowns, aprons, or lab coats must be worn when splashes of body fluid on skin or clothing are possible. Mask and eye protection are required when contact of mucosal membranes (eyes, mouth or nose) with body fluids is likely to occur (e.g. splashes or aerosolization). Resuscitation equipment, pocket masks, resuscitation bags, or other ventilation equipment must be provided to eliminate the need for direct mouth to mouth contact.

Universal precautions are intended to supplement rather than replace recommendation for routine infection control, such as hand washing and using gloves to prevent gross microbial contamination of hands (e.g., contact with urine or feces).

## **BLOOD-BORNE PATHOGEN CONTROL UNIVERSAL PRECAUTIONS AND GENERAL SAFETY RULES**

BCI will not perform invasive medical treatment or provide intravenous medication. Therefore, the exposure to Bloodborne Pathogens, is determined to be from routine and emergency first aid treatment of common workplace injuries. The following Universal Precautions and General Safety Rules have been established to prevent the spread of viral and bacterial organisms (namely HIV/HAV/HBV). In all cases, the Universal Precautions and General Safety Rules should be followed.

Before and immediately after providing patient care, wash exposed areas (hands, arms, etc.) with antibacterial soap. If contact with blood or other infectious materials occurs, then all equipment or environmental surfaces shall be cleaned & decontaminated afterwards.

Don and use the required personal protective equipment for the medical care given.

Treat all human body fluids and items soiled with human body fluids (blood, blood products, semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, concentrated HIV/HAV/HBV, and saliva (in dental settings) as if contaminated with HIV/HAV/HBV. (Note: Feces, urine, nasal secretions, sputum, sweat, tears, or vomitus need not be treated as contaminated unless they contain visible blood)

No smoking, eating, drinking or storage of food products are permitted in treatment areas.

To avoid special handling, all clothing contaminated with human body fluid will be presoaked (sprayed on the affected areas) with the antibacterial/viral solution before being sent to the laundry. (Note: Gloves and eye protection should be worn when handling contaminated clothing until presoaked for 10 minutes)

Any spills of body fluid will be presoaked (sprayed on the affected area) with antibacterial/viral solution for 10 minutes before being removed. (Note: Gloves and eye protection should be worn when handling spills of body fluids)

Medical Wastes (those soiled with covered human body fluids) will be treated following the Medical Wastes Treatment and Disposal Procedures before being discarded as ordinary wastes. Specimens of blood or other potentially infectious materials must be put in leak proof bags for handling, storage and transport.

Any suspected exposure to HIV/HAV/HBV by human body fluid contact (via broken skin, human bites, needle sticks, etc.) should be reported to your Supervisor immediately.

BCI shall make available the hepatitis B vaccine to all employees that have occupational exposure at no cost to the employee(s).

### **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

When the possibility of occupational exposure is present, PPE shall be provided at no cost to the employee such as gloves, gowns, etc. PPE shall be used unless BCI determines that employees temporarily declined to use PPE under rare circumstances. BCI shall ensure that appropriate PPE in the appropriate sizes is readily accessible. PPE should be cleaned, laundered & properly disposed. BCI shall repair & replace PPE as needed to maintain its effectiveness.



# CONFINED SPACE PROGRAM

The hazards that may be present in a confined space are not easily seen, smelled, heard or felt, but can represent deadly risks. The worker who enters confined spaces may be, or often is, exposed to multiple hazards due primarily to ignorance or negligence in the enforcement of safety regulations. This ignorance and neglect has led to countless deaths by asphyxiation, fire and/or explosion, and by fatal exposure to toxic materials.

A permit-required confined space (Attachments 12, 13 & 14) is one in which dangerous air contaminants may be generated and may not be removed by ventilation. When an employee works in this type of environment, the chance exists that atmospheres present may be oxygen deficient, combustible or toxic. Prevention of injuries to the life and health of workers requires that they be properly trained and well equipped to recognize, understand and control the hazards they could encounter. In the process of identifying a confined space, the supervisor in charge should always assume that a hazard is present.

## RESPONSIBILITIES/ DUTIES

For each confined space (Attachments 12, 13 & 14) entry, the Safety Department will appoint an Entry Supervisor who will have the following duties:

- Appoint an individual to serve as an authorized individual to perform the required monitoring and to issue entry permits.
- Assure that the authorized individual(s) (i.e. authorized entrants and attendants) receive all the necessary training to effectively discharge their duties. This shall be by review of training records with the Safety Department and interviews with the assigned personnel. All training shall occur before the individuals are assigned.
- Assure that all individuals who enter confined spaces receive the required training.
- Assure that all necessary equipment and supplies to effectively protect the health and safety of the workers are provided and maintained in a good state of repair.
- Develop departmental policies that will assure that all confined space entries are performed in compliance with this written program and all applicable regulations.
- Develop departmental policies that will assure that all required records are maintained.
- Department heads, or designated agents, shall be responsible for ensuring that the confined spaces under their control have been posted.
- Develop procedures for coordinating entry operations for multi-employers so that the employees of one employer do not endanger the employees of any other employer.

## SAFETY DEPARTMENT

- Develop a written control plan and perform an annual review to determine necessary revisions.
- Monitor the compliance of the respective departments with the plan and regulations to include compliance with training, monitoring, permitting, record keeping, etc.
- Provide guidance and technical assistance to departments in the design and selection of appropriate engineering and work practice controls.
- Provide guidance and technical assistance to departments in the selection of the most appropriate types and quantities of personal protective equipment.
- Provide consultation to the departments to assist them in fulfilling their training program.
- Promote compliance with the OSHA Standard.
- Provide a means in which employees can direct suggestions, complaints and concerns regarding the Confined Space Entry Program.
- Identify, log, and classify confined spaces before entry. This information shall be communicated to the entrants.

## **EMPLOYEE**

- Participate willingly in all training programs offered by BCI and learn as much as possible about the confined space entry protection procedure.
- Abide by all work rules and apply to the fullest extent possible the safety and health precautions specified by BCI.
- Report any problems that are observed, which could compromise health and safety, to the Safety Department or through the immediate supervisor.

## **CONFINED SPACE HAZARDS**

### **TYPES OF CONFINED SPACES**

Those of such design that restrict the movement of air in such a manner that ventilation may be inadequate.

Enclosed areas with very limited openings for entry and exit. Examples of open-topped confined spaces are pits, degreasers, and certain storage tanks. Gases that are heavier than air (such as butane and propane) can remain in low places of these type spaces where they are difficult to remove. Other hazards may also develop due to the nature of the work being involved or by a residue remaining in the space.

Confined spaces (Attachments 12, 13 & 14) may contain an engulfment or entrapment hazard. See the definition section of this document for a more detailed explanation of these terms. Confined spaces, such as trenches, sewers, tanks or silos usually have limited access and are considered the most hazardous. Gases, such as carbon dioxide and propane, that are heavier than air, may lie in recessed areas for hours or even days. Because many of these gases are odorless, the hazard may be overlooked with fatal results. At the opposite end, gases which are lighter than air may be trapped at the top of a space where access is from the bottom.

## **HAZARDOUS ATMOSPHERES**

### **FLAMMABLE ATMOSPHERE**

A flammable atmosphere generally arises from an enriched oxygen atmosphere, vaporization of a flammable liquid, chemical reaction, a by-product of work, heavy concentrations of combustible dust, and even desorption (release of entrapped substances) of chemicals from inner linings of confined spaces.

An atmosphere becomes flammable when the ratio of oxygen to combustible material in the air is neither too rich nor too lean for combustion to occur. Combustible gases or vapors will accumulate when there is inadequate ventilation in areas such as confined spaces. Flammable atmospheres may also be formed by chemical reactions. These occur when surfaces are initially exposed to the atmosphere or when chemicals combine to form flammable gases.

Combustible dust concentrations are usually found during loading, unloading, or conveying coal, grain, fertilizers or other combustible materials. The explosion from these concentrations occurs when high amounts of static electricity accumulates at low humidity readings and causes a spark which ignites the combustible mixtures present in the air. Also, desorption of chemicals from the inner linings of surfaces of a tank or vessel may produce a flammable mixture. An example of desorption can occur when propane is emptied from a tank. After the removal, the walls may desorb some remaining gas and create a flammable mixture in the tank.

## **TOXIC ATMOSPHERES**

Toxic atmospheres can be created from almost any gas, vapor, or airborne dust. Examples of the source of these substances include:

- The manufacturing process itself.
- The product being stored.
- The operation being performed in the confined space (e.g. welding or brazing certain metals).
- Leakage of lines within the space.
- Leakage of substances into the space from the outside.

Certain gases are prevalent in various vessels; one is carbon monoxide (CO). This odorless and colorless gas has approximately the same density as air and is formed from the incomplete combustion of such materials as wood, oil, gas, etc. It has poor warning signals as to its level of intoxication. Higher levels (more than 1,000 ppm) can occur without warning and are almost always fatal. Another prevalently released gas is hydrogen sulfide (H<sub>2</sub>S). Hydrogen sulfide may be formed several ways, but the most common way occurs when hydrochloric acid is combined with iron sulfide, as in the cleaning of vessel walls. Another common source of hydrogen sulfide is microbial breakdown of organic material, such as sewage, manure, garbage, etc.

## **IRRITANT (CORROSIVE) ATMOSPHERES**

Irritant or corrosive atmospheres can be divided into primary and secondary groups. Primary irritants exert no systemic toxic effects. The adverse effect exerted by them on the respiratory tract is direct irritation to the tissue. Examples of these are hydrochloric acid, sulfuric acid, and ammonia. A secondary irritant produces toxic effects plus surface irritation. Examples of this type are benzene and carbon tetrachloride. Prolonged exposure at high levels of irritant atmospheres may produce a general weakening of the nerve endings in the upper respiratory tract. The danger is that the worker generally is not aware of the onset of distress.

## **OXYGEN-DEFICIENT OR OXYGEN-ENRICHED ATMOSPHERE**

An oxygen-deficient atmosphere is caused when the oxygen (O<sub>2</sub>) level of an atmosphere depreciates below 19.5% by either consumption or displacement. The consumption of O<sub>2</sub> takes place during combustion of flammable substances, such as in welding. Oxygen may also be consumed during chemical reactions, such as the formation of iron oxide (rust). A second factor in an asphyxiating atmosphere is displacement by another gas. One such example of displacement is by "inverting" a tank by placing nitrogen in it. The total displacement of O<sub>2</sub> will cause immediate collapse and death. Since these gases are colorless and odorless, they pose an immediate hazard unless ventilation and oxygen measurements are carried out. A confined space should never be purged with nitrogen or other gas used in welding as this could lead to an oxygen-deficient atmosphere.

An oxygen-enriched atmosphere contains greater than 23.5% oxygen. The main hazard associated with an oxygen-enriched atmosphere is fire. Combustible materials burn significantly faster in the presence of an oxygen-enriched environment. Some materials which are generally not considered fire hazards will burn rapidly when the oxygen concentration is increased. A contaminated atmosphere must never be purged with oxygen as this would greatly increase the fire hazard in the space.

## DEFINITIONS

**Acceptable Entry Condition** - Means the conditions that must exist in a permit space to allow entry and to ensure that employees involved with a permit-required confined space (Attachments 12, 13 & 14) entry can safely enter and work within the space.

**Atmosphere** - Refers to the gases, vapors, mists, fumes, and dusts within a confined space.

**Attendant** - Means an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant duties assigned in BCI's permit space program.

**Authorized Entrance** - Means an employee who is authorized by BCI to enter a permit space.

**Combustible Dust** - A dust capable of undergoing combustion or burning when subjected to a source of ignition.

**Confined Space** - Refers to a space that (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; (2) Has limited or restricted means of entry or exit; and (3) Is not designed for continuous employee occupancy.

**Emergency** - Means any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

**Engulfment** - Engulfment is the surrounding and effective capture of a person by a liquid or finely (flowing) solid substance that can be aspirated or cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

**Entrant** - A person authorized to enter a confined space. The duties of the authorized entrant are:

- They must know hazards that may be faced during entry, including signs, symptoms, and consequences of exposure; they must properly use equipment (i.e. testing and monitoring, ventilating communication, rescue, etc.);
- They must communicate with the attendant as necessary to enable the attendant to monitor their status and to enable the attendant to alert entrants of the need to evacuate the space. In addition, the entrant must alert the attendant whenever the entrant recognizes any warning sign or symptom of exposure to a dangerous situation;

If the entrant detects a prohibited condition. The entrant must evacuate the area as quickly as practical whenever:

- Attendant or supervisor orders so
- Entrant recognizes warning signs/symptoms of hazardous exposure
- Entrant detects prohibited condition
- Evacuation alarm is activated.

**Entrapment** - A condition where an uninjured person is unable to remove themselves, or any body part, from a confined space. Entrapment occurs as a result of the configuration of a confined space and is often associated with converging or convoluted surfaces.

**Entry** - Entry is the action by which a person passes through an opening into a permit-required confined space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

**Entry Permit** - The entry permit is the written or printed document that is provided by BCI to allow and control entry into a permit space.

**Entry Supervisor** - The entry supervisor (such as BCI project supervisor or foreman) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required.

**Flammable or Explosive Limits** - When flammable vapors are mixed with air in the proper proportions, the mixture can be ignited. The range of concentrations over which the flash will occur is designated by the Lower Explosive Limit (LEL) and the Upper Explosive Limit (UEL). Flammable limits (explosive limits) are expressed as percent volume of vapor in air.

**Hazardous Atmosphere** - A hazardous atmosphere may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:

- Flammable gas, vapor, or mist in excess of 10% of the lower flammable limit.
- Airborne combustible dust at a concentration that meets or exceeds the lower flammable limit.
- Atmospheric oxygen concentration below 19.5% or above 23.5%
- Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published. Note: An atmospheric concentration of any substance that is not capable of causing death, incapacitation, and impairment of ability or self-rescue, injury or acute illness due to its health effects is not covered by this provision.
- Any other atmospheric condition that is immediately dangerous to life or health.

**Hot Work** - Any work involving burning, welding, riveting, or similar fire producing operations as well as work which produces a source of ignition, such as drilling or abrasive blasting.

**Immediately Dangerous to Life or Health** - Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individuals' ability to escape unaided from a permit space.

**Inserting** - Displacement of an area's atmosphere by a non-reactive gas (such as nitrogen) to such an extent that the resulting atmosphere is non-combustible.

**Isolation** - The process whereby the confined space is removed from service and completely protected against an inadvertent release of material. Examples are blanking off lines, lockout of electrical systems, and disconnecting mechanical linkages.

**Non-Permit Required Confined Space** - A non-permit confined space means a confined space that does not contain a recognized acute hazard or does not have the potential to contain, any hazard causing death or serious physical harm.

**Oxygen Deficiency** - An atmosphere where the oxygen concentration is less than 19.5%.

**Oxygen Enrichment** - An atmosphere where the oxygen concentration is greater than 23.5%.

**Permissible Exposure Limit (PEL)** - The maximum 8 hours, time weighted average of an airborne contaminant to which an employee may be exposed. At no time shall the exposure level exceed the ceiling concentration for the contaminants as listed in 29 CFR 1910 Subpart Z.

**Permit-Required Confined Space** - A permit-required confined space (Attachments 12, 13 & 14) has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere;
- Contains a material that has the potential for engulfing an entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains any other recognized serious safety or health hazard.

**Permit System** - The permit system is BCI's written procedure for preparing and issuing permits for entry and for returning the permit space to service following termination of entry.

**Purging** - The method by which gases, vapors, or other airborne impurities are displaced from a confined space.

**Retrieval system** - The retrieval system (including a retrieval line, full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from permit spaces.

**Threshold Limit Value (TLV)** - An occupational exposure guide published by the American Conference of Government Industrial Hygienist (ACGIH), extensively used to judge acceptable exposure levels to **hazardous substances**.

## **GENERAL SAFETY HAZARDS**

### **MECHANICAL**

If the activation of any electrical or mechanical equipment could cause injury to persons in a confined space, each piece of equipment shall be manually isolated and inactivated (locked out) before workers are allowed to enter a confined space. Also, there may be other hazards associated with confined spaces, such as flammable vapors or gases, in which special precautions must be taken. Preventing vapor leaks, flashbacks, and other hazards by closing valves is not sufficient. All pipes should be physically disconnected or isolation blanks bolted in place. Some tanks or vessels must also be blanked off and a blanket of inert gas placed within the tank to prevent a build-up of flammable vapors.

### **COMMUNICATIONS FOR PERMIT-REQUIRED CONFINED SPACES**

Communication between the worker and personnel outside is of the utmost importance. If a worker becomes unconscious or suddenly feels distressed, an injury may quickly become a fatality without proper communication. Communications should include visual monitoring at a minimum. Frequently, there are situations where visual monitoring is impossible and communication by means of an electronic communication system will be necessary.

### **ENTRY AND EXIT**

The extent of the time required to enter and exit is of major significance as a physical limitation and is directly related to the potential hazard of the confined space. The extent of precautions taken and the standby equipment needed to maintain a safe work area will be determined by the means of access and rescue. The following should be considered:

- Type of confined space to be entered
- Access to the entrance
- Number and size of openings
- Barriers within the space
- Occupancy load
- Time required to exit confined space
- Physical Effects
- Thermal Effects

When working in confined spaces, certain considerations must be taken to prevent conditions such as frostbite, hypothermia (excessive body heat loss) and heat stress. The use of protective clothing for both hot and cold environments will add additional bulk to the worker and must be considered in allowing for movement in the confined space and also for exit time in emergencies.

### **NOISE**

Noise problems are usually intensified in a confined space because the interior tends to cause sound to reverberate and cause extremely high noise levels. This high noise level can sometimes cause hearing damage to workers and can create problems with communication between workers inside the confined space, and assisting workers outside the confined space. Hearing protection must be provided when the time-weighted sound level pressure exceeds 85 decibels.

## **GENERAL**

Some physical hazards cannot be eliminated because of the nature of a confined space or the work to be performed. These hazards include such items as scaffolding, surface residues, and structural hazards. These hazards pose an almost unrecognizable threat when compared to threats posed by oxygen deficiency, combustible or lethal gas pockets, engulfment, entrapment, etc. These lesser problems, however, account for more injuries because of oversight. Sample of these problems are slips and falls, reaction of incompatible materials, improper scaffolding, electrical shock, etc. Because of these hazards, careful planning must be given to the relationship between the internal structure, the exit, and the worker.

## **MEDICAL REQUIREMENTS**

Medical requirements of employees who enter a confined space must be taken into consideration due to the increased hazard potential. In this type setting, employees must rely more heavily upon their physical, mental, and sensory attributes, especially under emergency conditions. In areas where the hazard potential is high, a person certified in CPR and First Aid should be in attendance.

## **TRAINING**

Training of employees for entering and working in confined spaces is required because of the potential hazards and the use of life-saving equipment. To ensure worker safety, the training program must be especially designed for the type of problems encountered. Instructional areas to be covered in the training program are:

- Potential dangers of confined space work
- Emergency exit procedures
- Use of respirators
- First Aid and Cardio-Pulmonary Resuscitation
- Lockout and Tagging procedures
- Fire Protection
- Communications
- Air Quality Monitoring
- Space Ventilation Procedures
- Training employees in permitting requirements must be done by a qualified person or someone knowledgeable in all relevant aspects of confined space entry procedures. The qualified person must be proficient in the following areas:
  - Types of confined spaces (Attachments 12, 13 & 14) that employees will be entering
  - Chemical and physical hazards
  - Work practices and techniques
  - Testing requirements, permissible exposure limits, etc.
  - Safety equipment such as respirators, protective clothing, and other protection such as helmets and shields
  - Rescue procedures
  - Knowledge of applicable Federal, State, and Local regulations
  - Evaluation and test methods

The effectiveness of the training program can be determined by the qualified person to see if safe work practices are being followed and testing the employee for knowledge of the operations and hazards. Training shall be provided an approved source. BCI shall provide training for all employees affected by confined spaces. Each affected employee must be trained prior to initial assignment, prior to a change in assigned duties, if a new hazard has been created or special deviations have occurred. The Safety Department shall certify that the required training has been accomplished. The certification shall include employee name, trainer signature/initials and dates of training. Certification must be made available to employees & their authorized representative.

## **CONFINED SPACE IDENTIFICATION AND WARNING**

All permit-required confined spaces (Attachments 12, 13 & 14) located inside buildings shall be identified and posted with appropriate signs to discourage the entry of unauthorized individuals. Where possible, they shall be secured to prevent unauthorized entry. The Safety Department shall identify, classify, and log the location of confined spaces. A copy of the log shall be provided to the rescue service and to departments that have employees who enter confined spaces. Contractors that enter confined spaces shall be provided with a list of the confined spaces in the building or areas in which they will be working. If a location is encountered that appears to meet the definition of a confined space, and it is not posted as such nor does it appear on the log, contact the Safety Department.

## **PERMIT RETENTION AND RECORD KEEPING**

Individual departments should maintain a copy of these forms. Any records kept by the Safety Department shall be retained for the time period specified below. The following records shall be maintained:

- Training. Information to include the date, location, instructor, content of course, name, and signature of trainee, etc. 3 years
- Permits and pre-entry check lists. 3 years
- Equipment calibration and maintenance log. 3 years
- Confined space log. Indefinitely

Additionally, records shall be reviewed for any entry operations that may not have provided enough protection for employees and corrective revisions for revising the program prior to subsequent entries shall be done. Examples of program review are: Any unauthorized entry of a confined space, a hazard not covered by the permit, the occurrence of an injury or near miss, employee complaints.

Review the confined space program, using the canceled permits retained within 1 year after each entry and revise the program as necessary, to ensure that employees are protected. BCI may perform a single annual review covering all entries performed during a 12-month period. If no entry is performed.

## **EQUIPMENT**

The Safety Department will provide and maintain at least one multi-channel gas detectors for use by BCI personnel. These units shall be calibrated per manufacturer's requirements. Departments may wish to purchase their own gas detectors or may borrow the detectors from the Safety Department. In addition, the Safety Department shall make available a single rescue tripod/winch, lifeline, and body harness for outside rescue.

## **CONTRACTORS**

The host employees, Contractors who work for BCI and/ or BCI employees enter confined spaces all parties shall be appraised of this written program and the entry procedure. The host employer shall inform BCI and/or any other contractors of hazards present in the space, the host's or BCI's experience, and any precautions or procedures. When employees of the host employer, BCI and a contractor enter a confined space together, the entry shall be coordinated to minimize hazards to the employees. The duties of "entrants", "attendants" and "entry supervisors" are to be clearly defined and label applied to each affected worker (see definitions, and other specific participant sections).



## **SPECIFIC PROCEDURES AND WORK PRACTICES**

The Confined Space Entry procedure does not cover all possible situations or conditions that could be encountered. Additional or different safety features or procedures may be necessary for specific operations. Physical protection for pedestrian and vehicular traffic & other barriers as necessary to protect entrants from external hazards shall be provided.

These procedures must be followed when entering confined spaces such as manholes, vaults, boilers, ductwork, vessels, etc. Its intent is to protect entering personnel against such hazards as oxygen deficiency, combustible gas and vapors, toxic gases and vapors, mechanical hazards, entrapment, etc.

Confined spaces may be closed on all sides, top and bottom, with entry provided through restricted openings, or may be open completely on one side, top or bottom. Entry is defined as breaking the plane of the confined space with any part of the body.

Permit-required confined spaces (Attachments 12, 13 & 14) are of greater hazard than non-permit required confined space. The entry points to permit-required confined spaces located within a building are marked with red stenciled signs stating: Danger - Permit-Required Confined Space, Do Not Enter.

It is important to realize that a non-permit required confined space may require re- classification based on the type of work to be performed. For example, an underground vault may be classified as non-permit required; however, if an employee will be applying a solvent within this space, it could be upgraded to a permit-required confined space. Therefore, there may be an ongoing need to re-evaluate the space if there is reason to believe changes have occurred, or employees or their representatives request additional monitoring.

**WARNING: SMOKING IS NOT PERMITTED IN A CONFINED SPACE OR NEAR THE ENTRANCE TO A CONFINED SPACE AT ANY TIME. THIS IS ESPECIALLY IMPORTANT WHEN THE SPACE IS BEING INITIALLY OPENED AND THE ATMOSPHERE TESTED.**

**WARNING: ALL ENERGY SOURCES MUST BE LOCKED OUT OR TAGGED OUT BEFORE ENTRY, UNLESS HOT WORK PERMITS HAVE BEEN AUTHORIZED BY THE SUPERVISOR.**

Before entering the confined space (Attachments 12, 13 & 14), a permit is filled out to verify that conditions in the permit space are acceptable for entry during its duration. BCI's workers should follow these minimum requirements:

Employees may not enter the confined space without specific training in confined space entry and approval of their supervisor;

Any conditions making it unsafe to remove an entrance opening cover shall be evaluated and the necessary precautions applied before the cover is removed;

When an entrance opening cover is removed, the opening will be promptly guarded by a railing, temporary cover or other temporary barrier that will prevent an accidental fall through the opening and will protect each employee working in the space from foreign objects entering the space.

At this point a check list must be completed. The permit form can be used for permit-required confined spaces (Attachments 12, 13 & 14) will serve as the check list in non-permit required confined spaces.

Employees or their representatives are entitled to request additional monitoring at any time.

In addition to the minimum requirements before entry, the following procedures must be observed for entry into a permit-required confined space:

Before an employee enters the space, the internal atmosphere must be tested with a calibrated direct-reading instrument for oxygen content, flammable gases and vapors and toxic gases and vapors (in that order). Note that some instruments test for multiple gases simultaneously. If the presence of a toxic gas or vapor is suspected in a confined space, other than carbon

monoxide or hydrogen sulfide, contact the Safety Department for advice on air sampling. Hot air and steam shall be ventilated from steam vaults before testing the atmosphere.

If possible, the atmosphere immediately inside the cover (entry point) must be tested without removing the cover. This testing can be accomplished by using the gas meter and the hand-held probe and sampling line attached to the pump. If the cover does not have a sampling port, carefully open the cover a small amount and check the atmosphere immediately inside the cover by lowering the gas meter into the space or inserting the hand-held probe and sampling line attached to the pump;

After testing the atmosphere immediately inside the confined space, carefully remove the cover. Test the atmosphere from the top to bottom and around ductwork and uneven surfaces. This testing can be done by slowly lowering the gas meter by its attached rope or string or using the hand-held probe and sampling line attached to the pump. Do not let the gas meter or end of the tubing submerge in any water that might be present. For horizontal confined spaces and confined spaces that must be entered from the bottom, it will be necessary to use a pole to test the atmosphere;

Avoid leaning over the space or placing your head inside the confined space you are testing. If the oxygen concentration test indicates an oxygen deficiency (less than 19.5%) or an excess (more than 23.5%), the gas meter should sound an alarm and forced ventilation must be provided. For ventilation of confined spaces, see Appendix I at the back of this procedure. No entry into the confined space will be permitted until follow-up tests after ventilation indicate that the atmosphere is safe.

If the flammability test (combustible gas) indicates flammable concentrations greater than 10% of the lower explosive limit, the gas meter should sound an alarm and forced ventilation must be provided. No entry shall be permitted until follow-up tests indicate that the atmosphere is safe.

The gas meters test for carbon monoxide and hydrogen sulfide. Carbon monoxide is produced by internal combustion engines and hydrogen sulfide is often found in sewers. If the gas meter indicates levels of either carbon monoxide that exceed 25 parts per million (ppm) or hydrogen sulfide that exceed 10 ppm, the gas meter should sound an alarm and forced ventilation is required. No entry shall be made until the atmosphere is safe.

After purging, sufficient ventilation shall be supplied to the confined space where needed, making sure that your source of ventilation air is not contaminating the confined space (i.e. carbon monoxide from traffic). At this point the confined space entry permit must be completed. Each person entering the confined space must sign the confined space entry permit. All authorized positions MUST BE listed and specific. The parties responsible for monitoring of the space must inform the entrants of the potential hazards and the results; they must participate in the permit review and signing. Ventilation must be used & testing must be conducted before entry & during work. The confined space entry permit must be posted near the entrance to the confined space. For outdoor entry points during wet or windy weather, the permit may be kept in a nearby safe location such as a company vehicle. It is now acceptable to enter the confined space. Continuous air monitoring must be conducted while the confined space is occupied. A gas meter should be worn by an employee in the confined space.

Pre-entry retesting for air contaminants in the confined space atmosphere must be made after every work break.

If a hazardous atmosphere is detected while individuals are in the space, each employee shall leave the space immediately.

If an attendant outside the confined space orders an evacuation or if the gas meter signals an alarm, all employees must immediately evacuate the confined space. The space shall not be re-entered until the source of the problem has been identified and corrected.

The completed confined space (Attachments 12, 13 & 14) entry permit or check list must be kept in the department files.

Upon completion of a work shift, the gas meter must be returned to its charger. If the next shift will continue the work, a gas meter with a fully charged battery must be obtained. If the gas meter is damaged or malfunctioning, tag the unit as being out of service. Repairs and recalibration must be performed before re-use.

An attendant must be stationed outside the confined space to maintain voice and/or visual contact with entrants and to recognize the early symptoms of danger in the space. The attendant must be fully familiar with rescue procedures and be able to recognize hazardous conditions. The attendant must not enter the confined space in an emergency, nor allow anyone else to enter the confined space unless they are an authorized trained rescuer. The attendant must order an evacuation of the confined space if a hazardous condition develops or when the workers inside the confined space appear to be in danger. The attendant will be on-duty for the duration of the entry. If more than one confined space is to be monitored by a single attendant, the Safety Department must be made aware and determine the method to enable the attendant to respond to emergencies in one or more permit spaces that he/she is monitoring without distraction from all responsibilities.

When applicable, wristlets, life line or full-body harnesses will be provided for each person in the confined space. In some cases, it will not be possible to use these rescue features based on the shape, size or contents of the particular confined space.

A mechanical winch and tripod, approved for rescue, must be provided for top entry permit-required confined spaces. The equipment shall be inspected upon set up. The attendant outside the confined space must be trained in the use of this equipment. In some cases, the winch and tripod cannot be used if they create a hazard.

A portable radio or other device must be used to maintain communication between the attendant and the entrant(s).

The number of employees allowed to enter a permit-required confined space must be kept to a minimum. The supervisor on site, or a designated authorized person, must complete the entry permit and make sure all entrants have signed before entry. The supervisor will cancel the permit at the completion of the job or when conditions substantially change within the confined space such that the permit is no longer valid.

## **RESCUE PROCEDURES**

If an employee is injured, or becomes unconscious in a permit-required confined space, the employee must be retrieved using the rescue tripod and winch or lifeline (if provided). Emergency personnel should be summoned via 911 as soon as possible after it is recognized that a problem exists. In some instances, the notification may have to be delayed until the injured person has been removed from the space.

The attendant must never enter a confined space. If rescue cannot be accomplished outside the confined space by using a tripod/winch or lifeline, then rescue assistance must be summoned immediately by calling 911 or in some situations by using portable radios to contact the site owner's emergency response department.

Rescue services shall be provided by the host facility, or outside services, and for IDLH conditions. If provided by the host facility: this must be noted in safety program and it is agreed upon by both parties. If outside services are used, they must be given an opportunity to examine the entry site, practice rescue, and decline as appropriate. If rescue services are provided by BCI a rescue team will be selected that is equipped and trained to perform the needed rescue services. IDLH Conditions require trained rescuers on site while work is being performed. If there is reliance on the client Host rescue services for use, this **MUST** be stated and agreed to in contract language. Rescuers must have PPE at no cost, training, and practice rescues at least every 12 months.

## **MECHANICAL VENTILATION OF CONFINED SPACES**

In many situations, it will be necessary to ventilate a confined space before entry and to maintain forced ventilation while the space is occupied. Forced ventilation is required to remove air contaminants, provide oxygen and to keep the air as clean as possible. The following is a guide to help ventilate confined spaces. Some confined spaces have a single opening, others have multiple opening; or are connected to tunnels, etc.

It is best to blow air into the confined space and draw it out simultaneously. This procedure generally requires two or more openings. For ventilation purposes, it is best to open as many of the adjacent entry points as possible.

With a confined space that has only a single entry point or when only a single fan is available, air should be blown into the confined space. A flexible hose is helpful in directing the air to the bottom of the confined space.

It is important that the fresh air intake not be contaminated. In some cases, a portable gasoline powered generator will be used to power the ventilation fan(s). The generator should be located as far as possible from the fan air intake. Motor vehicles or other internal combustion engines should not be allowed to operate with their exhaust pipes located near the air intakes.

When using ventilation, it is important to have a rough idea of the volume of the confined space to be entered. It is also important to know the rating of the ventilation fan. When forced ventilation of a confined space is required, at least three air changes should be provided before re-sampling. Here is an example:

An underground fault is 10 feet wide by 8 feet high by 10 feet long. Multiplying these three dimensions yields 800 cubic feet. The fan to be used is rated for 400 cubic feet per minute.

800 cubic feet = one air change every 2 minutes 400 cubic feet per minute

Thus it will take the fan two minutes to ventilate the confined space. It will take 6 minutes to provide the necessary three air changes.

## **EQUIPMENT FOR CONFINED SPACE ENTRY**

The following is a list of equipment that may be necessary for safe entry into the confined space.

- Hard hats, safety shoes, safety glasses and ear protection
- Ladder, respirator, lock, key, multiple-lock hasp, tags, lights, fans, barriers and fire extinguisher
- Portable radios
- Harness, lifelines (Attachment 19), wristlets, tripod and winch Perm

# CONSTRUCTIVE DISCIPLINARY PROGRAM

One of the best preventive measures to use to lower your accident rate is to keep safety in the mind of the employee at all times. It's not enough to tell your employees one time regarding a safety measure, rather an ongoing campaign of education and enforcement should exist as a natural part of your daily business- as natural as cleaning and maintaining equipment. Physical inspections of work areas are performed by company officials on a routine basis as an integral part of this program.

## DISCIPLINARY PROGRAM

The Safety Officers are responsible for enforcement of disciplinary program. Some examples of safety infractions (Attachment 15) are: not following verbal or written safety procedures or guidelines, workplace rules, horse play, failure to wear selected PPE, abuse of selected PPE, etc.

## SAFETY INFRACTIONS

All the safety training in the world will not get through to some workers. Others may require more training or reminding as usual. As a result, safety infractions (Attachment 15) will occur from time to time. In addition, management's commitment or lack thereof shall not be overlooked by the Safety Department. Physical inspections by company officials that indicate violations showing overall lack of commitment to company safety goals shall be under the same level of disciplinary actions. Supervisors who show overall lack of commitment to company safety goals shall be under the same level of disciplinary actions.

The important thing to note is that no matter how slight (within reason) all safety infractions (Attachment 15) should be communicated to the employee. A Safety Officer will meet with the employee to discuss the infraction & inform the individual(s) of the rule or procedure that was violated and the corrective action to be taken (see checklist). Typically, this will be in writing. This action by management accomplishes several things at once.

- First violation: Oral warning; notation for personnel file.
- Second violation: Written warning; copy for personnel file.
- Third violation: Written warning; one day suspension without pay.
- Fourth violation: Written warning and one-week suspension, or termination.

Zero-tolerance Violations: Some safety violations are of such serious nature that there will be no warnings and termination may result. Examples include:

- Entering hazardous confined spaces without following proper procedures,
- Failing to use fall protection equipment,
- Entering unsafe excavations.
- Both the employee and the supervisor allowing these unsafe acts may be terminated. A record will be maintained of all disciplinary actions.

You are establishing the fact that you are serious as a company regarding safety.

A company's lack of safety concern is a primary force in OSHA issuing citations for safety violations. A substantial amount of OSHA fines are a result of employees stating the company had little or no regard for safety. A record of safety infractions (Attachment 15) demonstrates to OSHA your commitment to safety.

You immediately prompt a concern from the employee to realize he/ or she has to “get on board” with your company’s safety policies. This should push your employee to seek out and read your safety procedures, attend safety talks, and perhaps have a better, safer attitude in the field.

The employee who doesn’t react positively to a safety infraction (Attachment 15), but continues to act unsafely will in the end be a victim of his/ her own actions. Establishing a paperwork trail will allow you to terminate the unsafe person, while keeping the safe worker- without possible repercussions of discrimination, etc.

Finally, safer attitudes among some employees will be catching. Soon all workers will want to act safely as a team. Even if the inevitable accident does occur, the workers, management, OSHA, your insurance carrier, and others will all know and understand that your safety policies were in place and used.

## **EMPLOYEES SUGGESTIONS**

Perhaps to balance the scales in the employees’ minds against the safety infraction notices (Attachment 15) is the tried-and-true Employee’s Suggestion Box. Every employee needs to know that as a part of your company’s overall safety program, a policy of listening to your employees’ safety suggestions is important to you. An anonymous atmosphere brought about by using a suggestion box may convince some employees to participate- where notoriety and perhaps a small reward may prompt others to submit their suggestions with their name. Either way, you and your workers benefit from this policy since management cannot always know exactly what goes on at each jobsite, and frequently employee suggestions are well-thought out, and applicable to your overall policy.

This management-employee working relationship is one of the points OSHA looks at when determining your company’s safety program’s efficacy.

# CRANE AND DERRICK SAFETY PROGRAM

The BCI written Crane and Derrick Safety Program establishes guidelines to be followed whenever any of our employees work with or near cranes or derricks at this company. The program is established to:

- Provide a safe working environment,
- Govern operator use of cranes and derricks, and
- Ensure proper care and maintenance of this equipment.

This program establishes uniform requirements designed to ensure that crane and derrick safety training, operation, and maintenance practices are communicated to and understood by affected employees. These requirements are also designed to ensure that procedures are in place to protect the health and safety of all employees.

It is our intent to comply with the requirements of 29 CFR 1926 Subpart CC, 29 CFR 1926 Subpart V and 29 CFR 1910.269.

## ADMINISTRATIVE DUTIES

The Safety Department will act as the administrator of this Crane and Derrick Safety Program and is responsible for developing and maintaining the written Crane and Derrick Safety Program. This person, acting as the representative of company management, is responsible for all facets of the program and has full authority to make necessary decisions to ensure the success of this program. The Program Administrator also has appropriate training and experience that is commensurate with the complexity of the program and is capable of identifying existing and predictable hazards to employees and taking prompt corrective measures to eliminate them. Our Administrator is both a “competent person” and a “qualified person” for the purposes of 29 CFR 1926 Subpart CC.

A copy of our Crane and Derrick Safety Program may be received by employees. It is located in our Rapid City office. Employees may obtain a copy of the program by contacting the Safety Department. If, after reading this program you find that improvements can be made, please contact the Safety Department. We encourage all suggestions because our company is committed to creating a safe worksite for all employees. We strive for clear understanding, safe work practices, and involvement in the program from every level of the company.

## “COMPETENT” AND “QUALIFIED” PERSONS

Because this written program depends on competent and/or qualified persons to perform specific tasks and because these terms are used throughout this program, it’s important to define these terms here. A competent person means “one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.”

A qualified person means “a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, successfully demonstrates the ability to solve/resolve problems relating to the subject matter, the work, or the project.”

## TRAINING

Training is one of the most important elements in this written program. The training provisions described here ensure that our employees have the necessary knowledge and skill to work safely with and around cranes and derricks.

## **TRAINING PROGRAMS**

Equipment operators and other site employees have a role in crane and derrick safety that may require training. We provide the following related training programs:

Nationwide Crane Training Operator Training

National Safety Compliance – Crane Safety

National Safety Compliance – Rigging Safety

NCCCO Mobile Crane Operator Certification

Only those employees deemed as qualified and competent and authorized by BCI will conduct initial and refresher training and evaluation of trainees. Those individuals deemed as authorized will have been determined to possess the necessary knowledge, training, and experience to train site employees in crane- and derrick-related subject matters.

After an employee has completed training, they must pass a written exam and a practical evaluation. The employee must successfully complete both before operation of equipment will be permitted.

Each trained employee is evaluated periodically to verify that the employee has retained and uses the knowledge and skills needed to work safely. If the evaluation shows that the employee is lacking the appropriate skills and knowledge, the employee will be retrained by an authorized instructor. When an employee has an accident or near miss or some unsafe behavior is identified, we also do retraining.

## **CRANE OPERATOR QUALIFICATION OR CERTIFICATION**

It is the policy of this company to permit only properly trained, and as required, properly qualified or certified personnel to operate cranes (Attachment 43). Division Management and the Safety Department will identify all new crane operators and ensure that they have obtained the necessary training, qualification and/or certifications in accordance with applicable laws and regulation, prior to the employee's operation of equipment. The Safety Department will ensure that proper qualifications and certifications have not expired.

However, an employee who is not qualified or certified is permitted to operate a crane as an operator-in- training and only if that individual:

- The tasks performed are within the individual's capabilities, and
- A qualified and authorized operator continuously monitors the operator-in-training.

No operator-in-training may operate a crane in any one of the following circumstances:

- A part of the equipment, load line, or load (including rigging and lifting accessories), if operated up to the equipment's maximum working radius in the work zone, could get within 20 feet of a power line that is up to 350 kV, or within 50 feet of a power line that is over 350 kV;
- The equipment is used to hoist personnel;
- Multiple-equipment lifts;
- The equipment is used over a shaft, cofferdam, or in a tank farm; or
- Multiple-lift rigging operations, except where the operator's trainer determines that the operator- in-training skills are sufficient for this high-skill work.



## **GROUND CONDITIONS**

Equipment must not be assembled or used unless ground conditions are firm, drained, and graded to a sufficient extent so that, in conjunction (if necessary) with the use of supporting materials, the equipment manufacturer's specifications for adequate support and degree of level of the equipment are met. However, the drainage requirement does not apply to marshes or wetlands. Also, these ground conditions are not required for cranes designed for use on certain types of railroad tracks.

If BCI is the “controlling entity,” or our company is the employer that has authority at the site when no controlling entity exists, then the Jobsite Superintendent will ensure that ground preparations necessary to meet the required ground conditions are provided.

In addition, if we are the controlling entity, the Jobsite Superintendent will also inform the equipment user and the location operator of known underground hazards (such as voids, tanks, or utilities).

If the assembly/disassembly director or the equipment operator determines that ground conditions do not meet requirements, these individuals must hold discussions with the controlling entity regarding the ground preparations that are needed so that, with the use of suitable supporting materials or devices (if necessary), the requirements can be met.

## **INSTALLATION, ASSEMBLY/ERECTING, AND DISASSEMBLY/DISMANTLING**

Failure to adequately address hazards associated with installation, assembly/erecting, and disassembly/dismantling is a significant cause of injuries and fatalities in the U.S. Therefore, our company follows all manufacturer provisions applicable to installation, assembly/erecting, and disassembly/dismantling for each individual crane and derrick. A competent and qualified person must direct the assembly/disassembly of each crane and derrick.

## **MODIFICATIONS**

Modifications or additions which affect the capacity or safe operation of a crane or derrick are prohibited, unless:

- The modifications or additions are reviewed and approved by the equipment manufacturer or a registered professional engineer (who is a qualified person), in accordance with §1926.1434;
- The original safety factor of the equipment is not reduced;
- The crane or derrick is tested in accordance with the Testing section of this written program
- The load charts, procedures, instruction manuals, and instruction plates/tags/decals, including the rated load marking, are modified as necessary to accord with the modification or addition.

Also, modifications or additions which affect the capacity or safe operation of the equipment are prohibited where the manufacturer, after a review of the technical safety merits of a proposed modification or addition, rejects the proposal and explains the reasons for the rejection in a written response. If the manufacturer rejects the proposal but does not explain the reasons for the rejection in writing within 30 days, then we may go ahead with the modification or addition, but only if the approvals and provisions under §1926.1434(b) are met.

## **TESTING**

Prior to initial use of all new and altered cranes and derricks, we shall conduct or direct tests to ensure proper and safe equipment operations. These tests shall determine that the crane or derrick must operate to the manufacturer's specifications and that the safety factors for load capacities are not less than stated by manufacturer.

## **INSPECTIONS**

The company seeks to prevent injuries and fatalities caused by equipment failures by establishing an inspection process that identifies and addresses crane and derrick safety concerns. The inspections are based on the nature of the critical components of our cranes and derricks; the degree of their exposure to wear, deterioration, or malfunction; manufacturer specifications; and applicable laws and regulations.

## PRE-ERECTION INSPECTIONS

Before each crane component is erected, a qualified person will inspect for damage or excessive wear, paying particular attention to components that will be difficult to inspect thoroughly during daily/shift inspections. If the qualified person determines that a component is damaged or worn to the extent that it would create a safety hazard if used on the crane, then that component must not be erected on the crane unless it is repaired and, upon re-inspection by the qualified person, found to no longer create a safety hazard.

If the qualified person determines that, though not presently a safety hazard, the component needs to be monitored, we ensure that the component is checked in monthly inspections. This determination is documented in accordance with our Recordkeeping section of this written program, and this documentation is made available to any individual who conducts a monthly inspection.

## DAILY PRE-USE INSPECTIONS

Visual inspection of all cranes (Attachment 16), derricks, wire rope, and related equipment will be made prior to each day the equipment will be used to look for apparent deficiencies. This inspection is the responsibility of the equipment operator. A checklist for daily inspection of cranes, derricks, and equipment includes, but is not limited to, the following:

- Condition of hooks, wedge sockets and sheaves;
- Hydraulic oil and other fluid leaks;
- Boom operation and condition of boom components;
- Tires;
- Outriggers;
- Safety pressure relief valves;
- Swing break
- Brake systems

If deficiencies are identified in a shift inspection, we follow these procedures:

<b>If deficiencies are identified for:</b>	<b>Then:</b>
Safety Devices	The equipment must be taken out of service and tagged out, and operations must not resume until the device is again working properly
Operational aids for proper operation	The equipment must not be operated until the aid is again working properly. However, the equipment may be operated where an operational aid is being repaired but we use the "temporary alternative measures" specified by the equipment manufacturer, if any.
Wire Rope	Use of the wire rope in question is prohibited until measures specified at §1926.1413(a) (4) are met.
Any other deficiency	The competent person must make an immediate determination as to whether the deficiency constitutes a safety hazard. If so, the equipment must be taken out of service and tagged out until it has been corrected.

## MONTHLY INSPECTION

The monthly inspection is performed on equipment that is in service. This inspection, performed by a competent person, includes those items listed for daily inspections, plus any wire rope deficiencies that the qualified person who conducts the annual inspection determined to be a safety hazard that needs to be monitored.

If a deficiency constituting a safety hazard is identified or a deficiency relating to the proper operation of safety devices or operational aids is identified, the equipment must not be used until an inspection by a competent person demonstrates that no corrective action is required. The person will document the inspection according to the Recordkeeping section of this written program.

## ANNUAL INSPECTION

The annual inspection performed at least once every 12 months promotes safety by ensuring that a thorough, comprehensive inspection of equipment is performed to detect and address deficiencies that might not be detected in a shift or monthly inspection. This inspection must be performed by a qualified person. In addition to daily inspection items listed above, this inspection also includes those items detailed by the manufacturer as being required for annual inspection. It is understood that in order to complete a comprehensive inspection, disassembly may be required. Those items to be inspected include but not limited to:

- Equipment structure and structural members, including jibs;
- Electrical components;
- Drive assembly;
- Gasoline, diesel and electric power plants;
- Entire hydraulic system, including pumps;
- Outrigger shafts

If a deficiency is identified, the qualified person must make immediate determinations, as follows:

<b>Qualified Person must determine whether:</b>	<b>If affirmative, then:</b>
A wire rope deficiency constitutes a safety hazard	Use of the wire rope is prohibited until the wire rope is replaced or the problem is corrected.
Any other deficiency constitutes a safety hazard	The equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in §1926.1416(d) or §1926.1435(e).
A “not-yet-safety-hazard” involving a wire rope needs to be monitored in the monthly inspections	We ensure that the deficiency is checked in the monthly inspections.
Any other “not-yet-safety-hazard” needs to be monitored in the monthly inspections	We ensure that the deficiency is checked in the monthly inspections.

Moreover, the qualified person will document the inspection according to the Recordkeeping section of this written program.

## SEVERE SERVICE INSPECTIONS

Where the severity of use or conditions are such that there is reasonable probability of damage or excessive wear (such as loading that may have exceeded rated capacity, shock loading that may have exceeded rated capacity, prolonged exposure to a corrosive atmosphere), use of equipment will stop and a qualified person must:

Inspect the equipment for structural damage to determine if the equipment can continue to be used safely,

Determine whether any items or conditions listed in §1926.1412(f) need to be inspected, and, if so, inspect those items or conditions. If a deficiency is identified, the qualified person must make immediate determinations, as follows:

Qualified Person must determine whether:	If affirmative, then:
The deficiency constitutes a safety hazard	The equipment must be taken out of service until it has been corrected, except when temporary alternative measures are implemented as specified in §1926.1416(d) or §1926.1435(e).
Any “not-yet-safety-hazard” needs to be monitored in the monthly inspections	We ensure that the deficiency is checked in the monthly inspections.

Finally, the qualified person will document the inspection according to the Recordkeeping section of this written program.

## INSPECTIONS FOR CRANES AND DERRICKS NOT IN REGULAR USE

Equipment that has been idle for three months or more must be inspected before use by a qualified person in accordance with the monthly inspection procedures listed above.

## OPERATING PROCEDURES

Cranes and derricks can create hazards that only safe operation can prevent. In addition to experience and knowledge gained through our crane safety training program and NCCCO certification program, each operator must read and understand the operator manual that is provided by the manufacturer for each crane and derrick they are to operate. After the operator has read and understood the proper operating procedures for the crane or derrick, they shall sign an acknowledgement form noting their understanding. A copy of the operating procedures and operator manual will be maintained in the operator cab at all times.

## STOP WORK AUTHORITY

The equipment operator has the authority to stop work when:

- The crane, derrick or rigging are deemed unsafe;
- The load to be lifted is exceeds equipment capacity;
- The ground conditions are unstable;
- The operator’s view is obstructed;
- Any other situation the operator deems unsafe to complete assigned task.

## **POWER LINE SAFETY PROCEDURES**

Any overhead power line must be considered energized unless and until the utility owner/operator indicates that it has been and continues to be de-energized and visibly grounded at the worksite. If equipment, assembly/erecting, disassembly/dismantling, travel, or hoisting activities are to be performed near overhead power lines, then before these activities are started:

The Project Superintendent must be notified that these activities are to be performed near overhead power lines; and

The Project Superintendent will make arrangements to ensure that:

- The lines are de-energized and visibly grounded at the point of work; or
- Safe clearances (as specified in the regulations) between the lines and any crane, derrick, conductive materials, tools, equipment, or any part of an employee's body are maintained, along with proper means of preventing encroachment or electrocution; or
- Other compliant alternative safety measures and procedures are used where the other options are not feasible. See §1926.1410 for more information on compliant alternatives.

With few exceptions found in the regulations, crane or derrick, assembly, disassembly, or operations are prohibited below a power line, unless the Project Superintendent has confirmed that the utility owner/operator has de-energized and (at the worksite) visibly grounded the power line, except where one of the exceptions in paragraph §1926.1408(d)(2) applies.

In addition to the above, equipment (with no load) traveling under or near a power line on a construction site is subject to the boom/mast position clearance specifications, speed and terrain considerations, spotter provisions, and poor visibility precaution requirements provided at §1926.1411.

## **SIGNALING PROCEDURES**

The Standard Method for hand signals are used and a "qualified" signal person (as specified at §1926.1428) is provided in the following situations:

- The point of operation is not in full view of the operator;
- The operator's view is obstructed in the direction the equipment is traveling;
- Either the operator or the person handling the load determines that a signal person is needed because of site-specific safety concerns. Signal charts are posted on the cab of each crane or derrick.
- Prior to beginning operations, the operator, signal person, and lift director (if there is one) must agree on the signals that will be used. Only one person may give signals to a crane or derrick operator at a time, unless anyone becomes aware of a safety problem and must give the stop or emergency stop signal to the operator.

## **WORK AREA AND CLEARANCE AREA PROCEDURES**

To prevent employees from entering the hazard areas of a crane or derrick:

- Each employee is trained to recognize hazards associated with rotating superstructure; or
- The hazard area shall be marked with an adequate means of control barriers or warning markers.
- If an employee must enter a hazard area of a crane or derrick, the employee or someone instructed by that employee must ensure the operator is informed that he or she is going to that location. In such situations for cranes with a rotating superstructure, the operator must not rotate the superstructure until the operator is informed that the employee is in a safe position.

In addition, the Project Superintendent designates any hoisting routes or load fall zones. No employee may be in a hoisting route or fall zone while a load is suspended, except for employees:

- Engaged in hooking, unhooking or guiding a load;
- Engaged in initial attachment of the load to a component or structure; or
- Operating a concrete hopper or concrete bucket.

Where any part of a crane or derrick is within the working radius of another crane or derrick, the Project Superintendent ensures that the controlling entity institutes a system to coordinate operations. However, if there is no controlling entity, then the Project Superintendent ensures that the employer(s) operating the multiple pieces of equipment will institute such a system.

## **SAFE WORK PRACTICE PROCEDURES**

Safe work practices are hazard control methods that reduce the likelihood of exposure to occupational hazards by addressing the manner in which a task is performed. Crane and derrick operations call for a number of safe work practices to prevent exposure to struck by, crushing, amputation, electrocution, slipping and falling, and other hazards. Safe work practices that are utilized include but are not limited to:

- Fall protection;
- Fire protection and prevention;
- Machine guarding;
- Stopping an operation whenever there is a safety concern;
- Proper rigging techniques;
- Hazard awareness and recognition

## **MAINTENANCE**

Any crane, derrick, or component deficiencies determined to constitute a safety hazard are serviced, adjusted, or repaired, or defective parts are replaced, promptly and before continued use. However, no modifications or additions that affect the capacity or safe operation of the equipment may be made without meeting the criteria in the Modification section of this written program.

The Project Superintendents and/or Maintenance Supervisor are responsible for ensuring the cranes and derricks, prior to use, are inspected, tested, and found to be capable of safe and reliable operation after any repair or adjustment that relates to safe operation. These qualified persons must determine if the repair or adjustment meets manufacturer equipment criteria or alternative criteria specified at §1926.1412(b) (1) (ii). Equipment may not be used a qualified person, through inspection, can demonstrate that the repair or adjustment meets the manufacturer equipment criteria or the alternative.

If a safety device listed at §1926.1415 is not in proper working order, the equipment will be taken out of service and tagged out, and operations may not resume until the device is again working properly.

Similarly, if an operational aid listed in §1926.1416 is not in proper working order, the equipment must not be operated until the aid is again working properly. However, the equipment with a defective operational aid may be operated where an aid is being repaired and we use the “temporary alternative measures” specified by the equipment manufacturer, if any. Operational aid repairs must be completed within the timeframes specified in §1926.1416.

While defective parts may be found, we prefer to invest time and effort into the proper upkeep and protection of our equipment, which results in day to day reliability. Keeping up with the manufacturer’s recommended maintenance schedules, and completing the proper records, will also increase our equipment’ longevity and enhance their resale value. In addition, we ensure that an accessible fire extinguisher is on equipment to help eliminate small fires quickly and lessen any damage.

The Maintenance/Shop Supervisor performs the recommended "breaking in" maintenance whenever our company purchases a crane or derrick. The Project Superintendents shall follow the manufacturer's operator instruction manual for daily or weekly maintenance. Periodic maintenance (completed monthly or less frequently) is done by the Maintenance Supervisor and qualified heavy equipment mechanics.

Our maintenance repair personnel are permitted to operate the equipment only where all of the following requirements are met:

- The operation is limited to those functions necessary to perform maintenance, inspect the equipment, or verify its performance; and
- The personnel either:
  - Operate the equipment under the direct supervision of a properly qualified operator or certified operator; or
  - Are familiar with the operation, limitations, characteristics, and hazards associated with the type of equipment.

All our maintenance and repair personnel meet the definition of a "qualified person" with respect to the equipment and maintenance or repair tasks performed.

**POSTING**

The Project Superintendent ensures that the following signs/notices/charts are posted conspicuously:

<b>Sign/ Notice/Chart</b>	<b>Location</b>
Electrocution warnings, clearances, and high voltage	On outside of crane or derrick
Hand signal charts	On outside of crane or derrick
Load chart (rated capacities);	On outside of crane or derrick
Moving parts warning signs	On outside of crane or derrick
Personnel platform weight and rated capacity	On outside of crane or derrick
Personal protective equipment signs	On outside of crane or derrick
Fire extinguisher identification signs	On outside of crane or derrick
Load hoist deceleration device is malfunctioning signs	On outside of crane or derrick
Other special hazard warning signs	On outside of crane or derrick

## RECORDKEEPING

The Safety Department, Maintenance Supervisor and Equipment Manager are responsible for maintaining the following records:

<b>Document/Records</b>	<b>Person Responsible</b>	<b>Location</b>
Qualification and certification records	Safety Officer	Rapid City Office
Operator Physicals	Safety Officer	Rapid City Office
Inspection, testing, and maintenance records	Maintenance Supervisor and Equipment Manager	Rapid City Office
Training logs	Safety Officer	Rapid City Office
List of crane and derricks used	Equipment Manager	Rapid City Office
Accident and injury records	Safety Officer	Rapid City Office
Hazard evaluations	Safety Officer	Rapid City Office

## PROGRAM EVALUATION

Our Crane and Derrick Safety Program Administrator is responsible for evaluating and, as necessary, updating this written program to maintain effectiveness. The program shall be evaluated, at a minimum, on an annual basis. However, if reviews of near-miss and accident records, consultation with operators, or the observation of unsafe behavior or equipment, the program will be reviewed and adjusted accordingly on an “as need” basis.



# **ELECTRICAL SAFETY AWARENESS PROGRAM**

It is the policy of BCI to take every reasonable precaution in the performance of work to protect the health and safety of employees and the public and to minimize the probability of damage to property. A clear understanding of these principles will improve the safety of working with or around electrical equipment.

## **PRACTICE PROPER HOUSEKEEPING AND CLEANLINESS.**

- Poor housekeeping is a major factor in many accidents. A cluttered area is likely to be both unsafe and inefficient. Every employee is responsible for keeping a clean area and every supervisor is responsible for ensuring that his or her areas of responsibility remain clean.

## **PLAN YOUR WORK.**

- A job briefing should be held before starting each job and include all employees involved. The briefing should cover hazards associated with the job, work procedures involved, special precautions, energy source controls, and PPE requirements.

## **IDENTIFY HAZARDS AND ANTICIPATE PROBLEMS.**

- Think through what might go wrong and what the consequences would be. Do not hesitate to discuss any situation or question with your supervisor and coworkers.

## **RESIST "HURRY-UP" PRESSURE.**

- Schedule pressures should not cause you to bypass thoughtful consideration and planned procedures.

## **DESIGN FOR SAFETY.**

- Consider safety to be an integral part of the design process. Protective devices, warning signs, and administrative procedures are supplements to good design but can never fully compensate for its absence. Completed designs should include provisions for safe maintenance.

## **MAINTAIN FOR SAFETY.**

- Good maintenance is essential to safe operations. Maintenance procedures and schedules for servicing and maintaining equipment and facilities, including documentation of repairs, removals, replacements, and disposals, should be established.

## **DOCUMENT YOUR WORK.**

- An up-to-date set of documentation adequate for operation, maintenance, testing, and safety should be available to anyone working on potentially hazardous equipment. Keep drawings and prints up to date. Dispose of obsolete drawings and be certain that active file drawings have the latest corrections. BCI shall advise the site owner of:
  - Any unique hazards presented by BCI's work;
  - Any unanticipated hazards found during BCI's work that the site owner did not mention; and
  - The measures BCI took to correct any hazards reported by the site owner to prevent such hazards from recurring in the future.

## **HAVE DESIGNS REVIEWED.**

- All systems and modifications to systems performing a safety function or controlling a potentially hazardous operation must be reviewed and approved at the level of project engineer or above.

## **HAVE DESIGNS AND OPERATION VERIFIED.**

- All systems performing safety functions or controlling a potentially hazardous operation must be periodically validated by actual test procedures at least once a year, and both the procedures and actual tests must be documented.

## **TEST EQUIPMENT SAFETY.**

- Tests should be made when the electrical equipment is de-energized, or, at most, energized with reduced hazard. Test instruments, equipment, and their accessories shall meet the requirements of ANSI/ISA-61010-1-Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use -Part 1 General Requirements, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 Volts and below. When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument shall be verified before and after an absence of voltage test is performed.

## **KNOW EMERGENCY PROCEDURES.**

All persons working in areas of high hazard (with high-voltage power supplies, capacitor banks, etc.) must be trained in emergency response procedures, including cardiopulmonary resuscitation (CPR) certification.

## **TRAINING REQUIREMENTS**

Employees shall be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with their respective jobs. Employees shall be trained to identify and understand the relationship between electrical hazards and possible injury. Documentation shall be made when the employee demonstrates proficiency, be maintained for the duration of the employee's employment, and contain each employee's name and date of training.

## **WORKING WITH ENERGIZED EQUIPMENT**

This section contains safety requirements that must be met in constructing electrical equipment and in working on energized electrical equipment. Special emphasis is placed on problems associated with personnel working on hazardous electrical equipment in an energized condition. Such work is permissible, but only after extensive effort to perform the necessary tasks with the equipment in a securely de-energized condition has proven unsuccessful, or if the equipment is so enclosed and protected that contact with hazardous voltages is essentially impossible. Special care shall be taken when working with conductive materials and equipment such as long dimensional conductor objects (ducts or pipes). Employees who handle and may be working with such objects shall work with the Safety Department to determine if any additional steps for safe work practices need to be taken.

Safety related work practices that pertain to qualified and unqualified electrical workers are listed below.

Employees who face a risk of electric shock but who are not qualified persons shall be trained & familiar with electrically related safety practices. Only qualified persons may work on electric circuit parts or equipment that has not been deenergized. Such persons shall be made familiar with the use of special precautionary techniques, PPE, insulating & shielding materials and insulated tools. Unqualified persons shall not be permitted to enter spaces that are required to be accessible to qualified employees only, unless the electric conductors and equipment involved are in an electrically safe work condition.

Employees shall be trained in safety related work practices that pertain to their respective job assignments; and

- Clearance distances.
  - Safe work practices shall be employed to prevent electric shock or other injuries resulting from either direct or indirect electrical contacts when work is performed near or on equipment or circuits which are or may be energized. If extension or stepladders are used, they shall have non-conductive side rails. Conductors and parts of electrical equipment that have been de-energized but not been locked or tagged out shall be treated as live parts.

## **PERSONAL PROTECTIVE DEVICES**

- Safety Glasses
  - Either safety glasses or a face shield must be worn when working on electrical equipment.
  - For work on any energized circuitry with a Class B or Class C hazard, the use of personal protective devices (e.g., face shields, blast jackets, gloves, and insulated floor mats) is encouraged, even if not required.
  - Conductive apparel shall not be worn unless they are rendered non-conductive by covering, wrapping or other insulating means.
  - Conductive items of jewelry or clothing shall not be worn unless they are rendered non-conductive by covering, wrapping or other insulating means.
  - All insulating PPE must be inspected before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air test, along with the inspection. Such tests include:
    - Blankets-before first issue/every 12 months thereafter,
    - Gloves-before first issue and every 6 months,
    - Sleeves before first issue and every 12 months.
    - Covers and Line hose shall be testing if insulating value is suspect.

### **Safety Practices**

Because a wide range of power supplies exist, no one set of considerations can be applied to all cases. Employees shall be trained in the skills and techniques to: distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment, to determine the nominal voltage of exposed energized electrical conductors and circuit parts, the approach distances specified in Table 130.2 of NFPA 70E, and the decision making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely. Program elements might include: evaluations, anticipating unexpected events, all electrical parts are considered live until proven otherwise, work permits, electrical flash arc hazard analysis. The following classification scheme may be helpful in assessing power-supply hazards.

Power supplies of 50 volts or less with high current capability too often are not considered a shock hazard, although these voltages are capable of producing fatal shocks. Since they are not "high voltage," such power sources frequently are not treated with proper respect.

In addition to the obvious shock and burn hazards, there is also the likelihood of injuries incurred in trying to get away from the source of a shock. Cuts or bruises, and even serious and sometimes fatal falls, have resulted from otherwise insignificant shocks.

Power supplies of 300 volts or more, with lethal current capability, have the same hazards to an even greater degree. Because supplies in this category are considered Class C hazards, they must be treated accordingly.

High-voltage supplies that do not have dangerous current capabilities are not serious shock or burn hazards in themselves and are therefore often treated in a casual manner. However, they are frequently used adjacent to lower-voltage lethal circuits, and a minor shock could cause a rebound into such a circuit. Also, an involuntary reaction to a minor shock could cause a serious fall (for example, from a ladder or from experimental apparatus).

Employees shall not enter spaces containing electrical hazards unless illumination is provided that enables the employees to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees shall not perform any task within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

Any vehicle or mechanical equipment near energized overhead lines shall be operated so that a clearance of 10 ft. is maintained. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10kV over that voltage. If the vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. (6 ft. for cranes) for lines up to 50KV. If the voltage is higher than 50kV, the clearance shall also be increased 4 in. for every 10 kV over that voltage. Employees standing on the ground may not contact the vehicle or mechanical equipment or any of its attachments.

If any vehicle or mechanical equipment capable of having parts of its structure elevated near energized overhead lines is intentionally grounded, employees working on the ground near the point of grounding may not stand at the grounding location whenever there is a possibility of overhead line contact. Additional precautions, such as the use of barricades or insulation, shall be taken to protect employees from hazardous ground potentials, depending on earth resistivity and fault currents, which can develop within the first few feet or more outward from the grounding point.

For work considered within the Limited Approach Boundary, a hazard/risk evaluation prior to work being done should be performed. Hazard Analysis should contain event severity, frequency, probability and avoidance to determine the level of safe practices employed.

- More than 300 Volts
  - To work on systems with voltages greater than 300 volts (CLASS B OR C HAZARD): Open the feeder breaker, roll out if possible, tag out, and lock if in enclosure. If work is on circuits of 600 V or more, positive grounding cables should be attached to all three phases. Tag should contain who, why, and when information and it is of vital importance because a person's life may depend on it. "Vital" in this case means that the presence and status of the tag are inviolate, and the tag must not be altered or removed except by the person who attached it.
- Less than 300 Volts
  - To work on systems with voltages less than 300 volts (CLASS A HAZARD): Turn-off and tag the feeder breaker. Tag is inviolate except on projects where established circuit checkout procedure allows a qualified person to remove it and energize circuit after checkout is complete.

### **Working On or Near Live Circuits**

Working on live circuits means actually touching energized parts. Working near live circuits means working close enough to energized parts to pose a risk even though you make be working on de- energized parts. Employees may not enter spaces containing exposed energized parts unless illumination is provided that enables the employees to work safely. Protective shields, protective barriers or insulating materials as necessary shall be used when working in confined or enclosed work spaces where electrical hazards may exist.

While any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out or tagged or both.

Work on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition, shall be considered energized electrical work and shall be performed by written permit only. Common tasks where you need to work on or near live circuits include:

- Taking voltage measurements
- Opening and closing disconnects and breakers
- Removing panels and dead fronts
- Opening electric equipment doors for inspection.

### Working on or Around Exposed Power lines

Table sets clearance distances for qualified workers.

Table S-5 Approach Distances for Qualified Employees Alternating Current Voltage range (phase to phase)	Minimum approach distance
300V and less	Avoid contact.
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm).
Over 750V, not over 2kV	1 ft. 6 in. (46 cm).
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm).
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm).
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm).
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm).
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm).

Proper clearances shall be maintained under and around energized exposed wiring. For overhead lines less than or equal to 50,000 volts, the minimum clearance for unqualified workers is 10ft. around the conductors. For voltages over 50KV, minimum distances shall be as shown in the following table.

Table A – Minimum Clearance Distance for Unqualified Employees - Alternating Current Voltage range (phase to phase)	Minimum clearance distance
Up to 50 kV	10 ft.
50kV to 200kV	15 ft.
200 kV to 350kV	20 ft.
350kV to 500kV	25*
500kV to 750kV	35*
750kV to 1000kV	45*
Over 1000kV	Utility owner determined

\* According to 1926.1409, for power lines over 350 to 1,000 kV, the minimum distance is presumed to be 50 feet. Over 1,000 kV, the utility/owner or a registered engineer must establish the minimum distance.

Clearances are a minimum of 6ft. when driving under lines for unqualified workers. The lines shall be de-energized and grounded or other protective measures shall be provided before work is started if the worker has to be closer than the above clearances.

# FALL PROTECTION PROGRAM

Work activities where employees may be subject to falls and/or falling objects shall be conducted safely with associated hazards eliminated and/or controlled. This policy covers minimum performance standards applicable to all employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

## Purpose

To ensure that employees are protected from the hazards associated falls and falling objects.

## Scope

Applies to all work sites, i.e., offices, client job sites, etc., where field construction related activities involve exposure to heights greater than or equal to six (6) feet and/or falling objects exist. In general industry (e.g. offices, shops, warehouses, etc.) exposure to heights greater than or equal to four (4) feet shall be in place of all references to the construction six (6) foot reference.

## Definitions

**Anchorage:** secure point of attachment for lifelines, lanyards, or deceleration devices that is capable of supporting 5,000 lbs. per employee or two times the intended impact load, whichever is greater, or for a positioning system, 3,000 lbs. without failure.

**Aerial Personnel Lifts:** a mechanical device used to provide temporary access for people or equipment to inaccessible areas, usually at height.

**Approved:** tested and certified by the manufacturer or any recognized national testing laboratory to possess the strength requirements specified in this section.

**Catenary Line** – see Horizontal Lifeline.

**Competent Person:** an individual knowledgeable (through experience and/or training) of fall protection equipment, including the manufacturer's recommendations and instructions for the proper use, inspection, and maintenance; who is capable of identifying existing and potential fall hazards; who has the authority to take prompt corrective action to eliminate those hazards; and who is knowledgeable of the rules contained in this section regarding the erection, use, inspection, and maintenance of fall protection equipment and systems.

**Controlled Access Zone:** an area in which certain work may take place without the use of guardrail systems, personal fall arrest systems, or safety net systems and access to the zone is controlled.

**Deceleration Device:** a device manufactured (fall) shock-absorbing device whereby the forces of the fall are rapidly reduced to meet acceptable levels.

**Drop Line:** a vertical lifeline secured to an upper anchorage for the purpose of attaching a lanyard or device.

**Employee:** every laborer regardless of title or contractual relationship.

**Fall Arrest System (Personal):** the use of multiple, approved safety equipment components such as body harnesses, shock absorbing lanyards, deceleration devices, drop lines, horizontal and/or vertical lifelines and anchorages, interconnected and rigged to one's body as to arrest a free fall (Attachment 19).

**Fall Protection Work Plan:** a written planning document in which the employer identifies areas in the work area where a fall hazard of 6 feet or greater exists, whereby conventional Fall Restraint and Fall Arrest Systems cannot be utilized.

**Fall Restraint System:** an approved device and any necessary components that function together to restrain an employee in such a manner as to prevent that employee from falling to a lower level.

**Fall Distance:** the actual distance from the employee's work platform (area) to the level where a fall would stop (ground level or otherwise).

**Full Body Harness:** a configuration of connection straps to distribute a fall arresting force over at least the thighs, shoulders and pelvis, with provisions for attaching a lanyard, lifeline, positioning rings, or deceleration devices.

**Full Body Harness System:** a Class III full body harness and shock absorbing lanyard attached to an anchorage or attached to a horizontal or vertical lifeline which is properly secured to an anchorage(s) capable of withstanding the forces specified in the applicable sections (Attachment 19).

**Hardware:** snap hooks, D-rings, buckles, carabineers, and adjusters used to attach the components of a fall protection system together.

**Holes (floor, roof or walking surface):** any opening in the floor greater than two inches whereby falling objects or an employee fall equal to, or greater than six foot is possible.

**Holes (wall)** – see Wall Opening.

**Horizontal Lifeline:** an approved rail, rope, or synthetic cable installed in a horizontal plane between two anchorages and used for attachment of an employee's lanyard or lifeline device while moving horizontally.

**Lanyard:** a flexible line of webbing, rope or cable (usually in two, four or six foot lengths) used to secure a harness to a lifeline or an anchorage point.

**Leading Edge:** means the advancing edge of a floor or roof, where a fall of more than six foot is possible to the ground or to another level.

**Lifeline (vertical or horizontal):** an approved vertical line from a fixed overhead anchorage or horizontal line between two horizontal anchorages, independent of walking or working surfaces, to which a lanyard or device is secured.

**Restraint Line:** a line from a fixed anchorage or between two anchorages to which an employee is secured in such a way as to restrict the employee from reaching a point where falling to a lower level is possible.

**Safety Line** – see Lifeline.

**Shock Absorbing Lanyard:** a flexible line of webbing or rope used to secure a harness to a lifeline or anchorage point that has an integral shock absorber of either a rip-stitch or retractable configuration.

**Snap Hook:** a 'locking' hook at the end of a lanyard or restraining/positioning line that has a double-action locking mechanism intended to eliminate unintentional unhooking from the D-ring of a body harness. Non-locking snap hooks are prohibited.

**Standard Guardrail:** a top rail at 42 inches high (plus or minus three inches), a mid-rail installed midway the top edge of the guardrail system and the surface.

**Static Line** – see Lifeline.

**Toe Board:** a barrier at the base of the guardrail system to prevent material and objects from falling off the surface. They are at least four (4) inches of nominal height with no less than one (1) inch clearance from the surface.

**Unprotected Sides and Edges:** any side or edge (except at entrances to points of access) of a floor, roof, ramp, or runway where there is no wall or guardrail system.

**Walking/Working Surface:** are 45 inches or greater in all directions through which employees pass or conduct work, and can include scaffolding and aerial lifts regardless of surface dimensions.

**Wall Opening:** a gap in a wall where the outside bottom edge is 6 feet or more above lower levels, and the inside bottom edge (e.g. parapet wall) is less than 39 inches above the walking/working surface.

**Work Area:** that portion of a walking/working surface where work activities are being performed.

## **REQUIREMENTS:**

### **Training**

Fall Protection training requirements shall include:

- New employees with work responsibilities requiring the use of fall protection will be oriented to the Fall Protection Program (and any local addendums) as part of the ‘new employee orientation program’.
- At new worksites, i.e., offices, client job sites, etc., during the pre-job meeting to describe specific fall protection requirements of the job.
- Thereafter, every foreseeably exposed employee will be trained at least annually, and include the following:
  - The nature of fall hazards in the typical work area
  - The correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems
  - The use and operation of conventional and non-conventional fall protection systems
  - The role of each employee in the safety monitoring system when such a system is in use
  - The limitations on the use of mechanical equipment during the performance of roof work on low-slope roofs
  - The correct procedures for equipment and materials handling and storage, and the erection of overhead protection
  - The correct fit, maintenance and use of (personal) fall arrest system components, as determined by the manufacturer(s)
  - Rescue procedures in the event an individual falls
  - All other details in this section (and local addendums)

Toolbox talks for related issues of this program shall be covered periodically.

Retraining shall also occur whenever deficiencies in the training program are identified, standard requirements change or are modified or new fall protection systems are introduced.

Any employee who has not received orientation or annual training (as previously outlined) shall not be allowed to work at heights identified by this section.

Training provided shall be documented and maintained in a training file at the Rapid City Office. Training will include dates of training, instructor’s name, topics / material covered and attendee names.

### **Conventional Fall Arrest and Fall Restraints Systems**

Conventional Fall Arrest and Fall Restraints Systems shall be utilized where the exposure to falls greater than 6 foot and from falling objects as is reasonably foreseen. The following systems shall be utilized:

- Guardrail System (fall restraint and potentially from falling objects)
- Top rails and mid rails of guardrail systems constructed of wood shall be at least ¼ inch diameter or thickness to prevent cuts and lacerations.
- If wire rope is used for top rails, it shall be flagged at not more 6 feet intervals with high-visibility material. Steel and plastic banding are prohibited for use as top rails or mid rails.
- The top edge height of top rails, or (equivalent) guardrails shall be 42 inches, plus or minus 3 inches, above the walking/working level.
- When employees are using ladders in distance proximity equivalent to the maximum use-length of the ladder, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the maximum use-length height of the ladder, or see Special Control Procedures (5.4.5) portion (for ladders) of this section for other



options.

- Screens, mid rails, mesh, intermediate vertical members, or equivalent intermediate structural members shall be installed between the top edge of the guardrail system and the walking/working surface when there are no walls or parapet walls at least 21 inches high. When mid rails are used, they shall be installed at a height midway between the top edge of the guardrail system and the walking/working level. When screens and mesh are used, they shall extend from the top rail to the walking/working level. Intermediate members, such as balusters, when used between posts, will not be more than 19 inches apart.
- The guardrail system shall be capable of withstanding a force of at least 200 pounds of force applied within 2 inches of the top edge in any outward or downward direction. When the 200 pounds is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working level.
- Mid rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members will be capable of withstanding a force of at least 150 pounds of force applied in any downward or outward direction at any point along the mid rail or other member.
- Guardrail systems shall be free of sharp edges and burrs to protect against punctures or lacerations and to prevent clothing from snagging.
- The ends of top rails and mid rails shall not overhang terminal posts, except where such an overhang does not constitute a projection hazard.
- When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.
- At uncovered holes, guardrail systems shall be set up on unprotected sides or edges. When holes are used for the passage of materials, the hole shall have not more than two sides with removable guardrail sections. When the hole is not in use, it shall be covered or provided with guardrails along unprotected sides/edges.
- If guardrail systems are used around uncovered holes that are used as access points (such as ladder ways), gates shall be used or the guardrail shall be offset at a 45 degree angle to prevent accidental walking into the hole. Toe boards shall be utilized around the edges not utilized as the actual access point.
- If guardrails are used at unprotected sides or edges of ramps and runways, they shall be erected on each unprotected side/edge.
- When guardrail systems, in combination with netting, is used to prevent materials from falling from one level to another, openings shall be small enough to prevent passage of potential falling objects.

### **Covers for Holes (fall restraint and from falling objects):**

- Covers (or a guardrail system with toe boards...see Guardrail Systems within this section) shall be installed over holes equal to or greater than 2" in floors, roofs and walkways that are more than 6 feet above lower levels.
- Hole covering material shall support at least two times the potential weight that will cross over it. If plywood is chosen as the cover material, it shall be of at least ¾ inch in thickness.
- Hole covers shall be secured in place in such a manner as to not easily be displaced. Examples of securing methods include, but are not limited to: nailing, attached cleats, wire, etc.
- Such covers shall have the word 'HOLE' or 'COVER' predominately marked on the top surface. Where covers are too small for such marking, they shall be painted or significantly marked in the color orange.

## **Restraining/Positioning System (fall restraint):**

- Only full body harness systems (Attachment 19) with positioning rings are to be utilized with any restraining/positioning system.
- Restraint line (rope) length shall not exceed the distance to fall exposure, and shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.
- Requirements for body harness systems, snap hooks, D-rings, and other connectors used with positioning device systems (Attachment 19).
- No makeshift fall protection equipment may be utilized.
- Body belts are prohibited.

## **(Personal) Fall Arrest Systems**

(Personal) Fall Arrest Systems shall do all of the following:

- Limit maximum arresting force on an employee to 1,800 pounds. Note: total body weight including tools cannot exceed 310 lbs. to stay under arresting force limit
- Be rigged so that an employee can neither free fall more than 6 feet nor contact any lower level
- Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet
- Have sufficient strength to withstand 5000 lbs. (excluding horizontal lifelines which require a safety factor of at least two times the potential impact energy)
- All components of the (personal) fall arrest system (lanyards, body harness and attached hardware, and shock-absorbing devices) shall meet the design specifications of OSHA 1926.502 Subpart M
- The following items/actions are prohibited for use with (personal) fall arrest systems:
  - body belts
  - non-locking snap hooks
  - lanyards without shock absorbers
  - tying back to the lanyard (once around another object) for a means of an anchorage point, unless the lanyard was designed for this purpose by the manufacturer
  - the object tied around can support the anticipated fall force and the object does not have sharp edges or burrs

## **(Personal) fall arrest systems**

(Personal) fall arrest systems shall be utilized in the following manner:

### **Pre-Use Inspection**

- All components shall be inspected prior to each use for wear damage, and other deterioration in accordance with manufacturer's requirements (see Equipment Inspection and Maintenance Procedures of this section).
- General Proper Body Harness Fit Guidelines (two employees are usually required to completely fit each other)
- The body harness type and size shall meet the physical needs of its user (male/female or small, medium, large, etc.).
- Follow the manufacturer's guidelines on proper fit.
- Shoulder, thigh, button and chest straps shall be fit snugly whereas it is slightly difficult to slide the hand underneath.
- Loose straps ends shall be folded back under.
- D-ring placement should be between the shoulder-blades.
- Chest straps should be positioned across the mid-chest area.
- Sufficient Anchorage Points Utilized

Anchorage shall be used under the supervision of a competent person, as part of a complete (personal) fall arrest system that maintains a safety factor of at least two (i.e., capable of supporting at least twice the weight expected to be imposed upon it).

Anchorage used to attach (personal) fall arrest systems will be independent of any anchorage being used to support or suspend platforms and shall be capable of supporting at least 5,000 pounds of force per person attached.

Anchorage points can include:

- Lifelines (horizontal and vertical)
- Designed anchorage points on aerial lifts
- Eye-bolts listed for use by the manufacturer
- Specially designed anchorage tools specifically designed to meet fall force requirements, including:
- Wrap-around lanyards as approved by the manufacturer
- I-beam clamps designed specifically as an anchorage point
- Prohibited anchorage points include, but are not limited to:
  - Standard guardrails and railing
  - Ladders/rungs
  - Scaffolding, unless approved by the manufacturer for/with anchorage points
  - Light fixtures, ductwork, conduit, pipe vents, wiring/duct/piping harnesses, other roof stacks, vents or fans
  - C-clamps
  - Piping (unless capable of meeting the criteria of an anchorage point)
  - To a lanyard (around a solid object), unless the lanyard and hardware is manufactured for that purpose

### **Lifeline/Lanyard Applications**

Lanyards shall only be attached to anchorage points sufficient to meet the fall force requirements.

Shock-absorbing lanyards are required to limit the fall force to less than 1800 pounds.

Self-retracting lanyards (retractable) capable of withstanding the tensile load of 3,000 lbs. that limit the free fall distance to two (2) feet or less are always recommended and are required when the fall distance is less than nineteen and one-half (19.5) feet.

Lanyards that do not limit free fall distance to 2 feet or less, such as rip stitch lanyards and tearing/deforming lanyards will be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

Horizontal lifelines will be designed, installed, and used under the supervision of a Competent Person, as part of a complete (personal) fall arrest system. Lifelines shall be protected against being cut or abraded. Horizontal lifelines cannot exceed sixty feet in length.

Vertical lifelines shall be utilized with leading edge work, shall reach the ground, and the method of anchorage attachment shall be of proper design (i.e. no knots).

## Safety Net System (fall arrest and potentially from falling objects)

When utilized, safety nets shall be installed as close as practicable under the walking/working surface on which employees are working and never more than 30 feet below such levels.

Safety nets will be inspected at least once a week for wear, damage, and other deterioration. The maximum size of each safety net mesh opening will not exceed 36 square inches nor be longer than 6 inches on any side, and the openings, measured center-to-center, of mesh ropes or webbing, will not exceed 6 inches.

Defective/unfit nets are not to be used and are to be taken from service and immediately destroyed by cutting into unuseful sizes and properly disposed.

Mesh crossings will be secured to prevent enlargement of the mesh opening. Each safety net or section will have a border rope for webbing with a minimum breaking strength of 5,000 pounds. Connections between safety net panels will be as strong as integral net components and be spaced no more than 6 inches apart.

Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance from working level to horizontal plane of net surface.	Minimum required horizontal distance of outer edge of net from edge of working surface.
Up to 5 feet	8 feet
More than 5 feet up to 10 feet	10 feet
More than 10 feet	13 feet

Safety nets shall be tested at the beginning of each workday and shall be capable of absorbing an impact force of a drop test consisting of a 400-pound bag of sand 30 inches in diameter dropped from the highest walking/working surface at which workers are exposed, but not from less than 42 inches above that level. Employees shall not be allowed in work areas controlled with safety nets until this test is complete.

If safety nets are utilized for the dual purpose of employee fall protection and the protection of other workers from fall objects, the net webbing opening shall be small enough to prevent passage of potential falling objects.

Items that have fallen into safety nets, such as materials, scrap, equipment, and tools, shall be removed as soon as possible and at least before the next work shift.

Where conventional fall restraint and fall arrest methods cannot be utilized (or utilized safely), the following non-conventional methods can be utilized

A written work plan shall be developed when a project or task possesses a fall exposure whereby these systems are utilized. A sample written plan format can be found in 29 CFR 1926 Subpart M Appendix E.

A Competent Person will develop and implement a written Fall Protection Work Plan including each area of the work place where the employees are assigned and where hazards of 6 feet or more fall will exist. The Risk Assessment for this project/task should be reviewed for this document.

The written Fall Protection Work Plan shall include:

- Identification of fall hazards in the work area
- Describe the non-conventional method (or in combination with conventional method) of fall protection to be provided
- Describe the correct procedures for the assembly, maintenance, inspection, and disassembly of any fall protection system to be used
- Describe the correct procedures for the handling, storage, and securing of tools and materials
- Describe the method of providing overhead protection for workers who may be in or pass through the area below the work site
- Describe the method for prompt, safe removal of injured workers
- Describe the method for destruction of personal fall arrest system equipment subjected to the forces of any fall
- Be available at all times on the jobsite

### **Controlled Access Zone System**

Controlled access zone systems shall be set up as follows:

- Zone shall be established no closer than six (6) feet or further than twenty-five (25) feet from any leading edge
- Control line shall extend parallel along the entire length of the unprotected or leading edge
- Only trained employees are allowed in the Zone
- The Zone shall have signage marking it as a 'Controlled Access Zone'

### **Warning Line System (pitches of $\leq 4:12$ and flat surfaces only)**

Warning line systems consist of ropes, wires, or chains, and supporting stanchions and are set up as follows:

- Flagged at not more than 6-foot intervals with high-visibility material
- Rigged and supported so that the lowest point including sag is no less than 34 inches from the walking/working surface and its highest point is no more than 39 inches from the walking/working surface
- Stanchions, after being rigged with warning lines, will be capable of resisting, without tipping over, a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the walking/working surface, perpendicular to the warning line and in the direction of the floor, roof, or platform edge
- The rope, wire, or chain will have a minimum tensile strength of 500 pounds, and after being attached to the stanchions, shall support without breaking the load applied to the stanchions as prescribed above
- Line will be attached to each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in the adjacent section before the stanchion tips over
- Warning lines will be erected around all sides of roof work areas. When mechanical equipment is being used, the warning line will be erected not less than 6 feet from the roof edge parallel to the direction of mechanical equipment operation, and not less than 10 feet from the roof edge perpendicular to the direction of mechanical equipment operation
- When mechanical equipment is not being used, the warning line shall be erected not less than 6 feet from the roof edge.
- The warning line system shall be used in conjunction with one of the following:
  - safety monitoring system (most common); or
  - (personal) fall arrest system; or
  - safety net system; or
  - guardrails

## **Safety Monitoring System**

A competent person will appoint the safety monitor and will ensure that the safety monitor:

- Is competent in the recognition of fall hazards
- Is capable of warning workers of fall hazard dangers and in detecting unsafe work practices
- Is operating on the same walking/working surfaces of the employees and can see them
- Is close enough to work operations to communicate orally with the employees and has no other duties but the monitoring function
- Has the authority to stop work

Only employees engaged in roof/surface work and the safety monitor shall be allowed in an area where an employee is being protected by a safety monitoring system.

## **Specific Fall Hazard Procedures**

### **Aerial Personnel Lifts**

Employees utilizing aerial personnel lifts (e.g. scissor lifts, genie lifts, cherry-pickers, boom-lifts, etc.) shall use a restraint/positioning system or (personal) fall arrest system, even though a guardrail system is in place.

Attachment points for these systems shall be capable of withstanding 5,000 pounds and shall be maintained in the floor of the lift or where designed by the manufacturer.

Rails of such lifts shall not to be used as attachment points unless designed for that purpose by the manufacturer.

### **Excavations**

Employees who work at the edge of an excavation 6 feet or more deep will be protected from falling into the excavation by guardrail systems or covers.

Where walk-ways are provided to permit employees to cross over excavations, guardrails are required on the walkway if the fall would be 6 feet or more to the lower level.

### **Hoist Areas**

Each employee in a hoist area will be protected from falling 6 feet or more by guardrail, restraint/positioning or (personal) fall arrest systems.

If guardrail systems (or chain gate or guardrail), or portions thereof, must be removed to facilitate hoisting operations (Attachments 31, 32, 33 & 34), as during the landing of materials, and a worker shall lean through the access opening or out over the edge of the access opening to receive or guide equipment and materials, that employee shall be protected by a (personal) fall arrest system.

### **Falling Objects (additional protection from)**

Except for scaffolding and aerial lifts, no materials or equipment shall be stored within 6 feet of working edges.

When canopies are used as protection from falling objects, canopies shall be strong enough to prevent collapse and to prevent penetration by any objects that may fall onto them.

When toe boards are used as protection from falling objects, they shall be erected along the edges of the overhead walking or working surface for a distance sufficient to protect persons working below. Toe boards will be capable of withstanding a force of at least 50 pounds of force applied in any downward or outward direction at any point along the toe board. Toe boards will be a minimum of four (4) inches tall from their top edge to the level of the walking/working surface, have no more than one (1) inch clearance between its bottom and the surface.

Ladders (where work height (due to leaning out) exposure is equal to, or exceeds six foot and/or the maximum ladder height is within the distance to a leading edge)

If work is performed outside the rails of a ladder equal to, or exceeding 6 feet; or if three-point contact on the ladder cannot be maintained, a (Personal) Fall Arrest Systems shall be utilized if anchorage points are available.

If anchorage points are not available or other traditional fall control systems are not feasible, a non-conventional system can be utilized.

### **Leading Edge Work**

Employees working near a leading edge 6 feet or more above lower levels shall be protected by guardrail, safety net, restraint/positioning, or (personal) fall arrest systems. If these systems are not feasible the systems under 5.3 of this manual section can be utilized.

### **Roadway/Vehicular Passage Covers**

Covers located in roadways and vehicular aisles shall be able to support at least twice the maximum axle load of the largest vehicle to which the cover might be subjected, and secured/marked as indicated in 5.2.2 of this program section.

### **Roofs (work from or on)**

Low-sloped (<4:12 pitch)

Employees engaged in roof activities on low-slope roofs with unprotected sides and edges 6 feet or more above lower levels will be protected from falling by guardrail systems, safety net systems, (personal) fall arrest systems or a combination of a warning line system and guard-rail system, warning line system and safety net system, warning line system and (personal) fall arrest system, or warning line system and safety monitoring system.

5.4.8.2 Steep Roofs (>4:12 pitch)

Employees on a steep roof with unprotected sides and edges 6 feet or more above lower levels will be protected by either guardrail systems with toe boards, a safety net system, or a (personal) fall arrest systems.

### **Wall Openings**

Employee working on, at, above, or near wall openings (including those with chutes attached) shall be protected from falling by the use of either a guardrail system, a safety net system, or a (personal) fall arrest system.

### **Equipment Inspection and Maintenance Procedures**

#### **Inspection, Replacement and Destruction**

All equipment hereafter noted shall be visually inspected before each use, replaced immediately if any of the defective conditions are found, tagged 'out of service' and sent back to the Rapid City office for destruction.

#### **Body Harness Inspection:**

- Beginning at one end, holding the body side of the harness toward you, grasp one area of the harness with your hands six to eight inches apart. Bend the strap in an inverted "U". Follow this procedure the entire length of the belt or harness. Watch for frayed edges, broken fibers, pulled stitches, cuts, burn marks or chemical damage. Special attention should be given to the attachment of buckles and D-rings to strap webbing. Inspect for frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface.
- Rivets should be tight and unmovable with fingers. Body-side rivet base and outside rivet burr should be flat against the material. Bent rivets will fail under stress. Especially note condition of D-ring rivets and D-ring metal wear pads (if applicable). Discolored, pitted, or cracked rivets indicate chemical corrosion.

- The tongue or billet of bolts receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted, or broken grommets. Harnesses using punched holes without grommets should be checked for torn or elongated holes causing slippage of the tongue buckle.
- Hardware (Buckles, D-Rings, Snaps and Thimbles)
- Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Roller should turn freely on frame. Check for distortion or sharp edges.
- Inspect the friction buckle for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.
- Inspect the sliding bar buckle frame and sliding bar for cracks, distortion, or sharp edges. The sliding bar should move freely. Knurled edge will slip if worn smooth. Pay special attention to corners and ends of sliding bar.
- Inspect the forged steel D-ring for cracks or other defects. Inspect the assembly of the D-ring to the body pad or D-saddle. If the D-ring can be moved vertically independent of the body pad or D-saddle, the harness should be replaced. Check D-Rings and D-Ring metal wear pad (if any) for distortion, cracks, breaks, and rough or sharp edges. The D-Ring bar should be at a 90 degree angle with the long axis of the belt and should pivot freely.
- Inspect closely for hook and eye distortions, cracks, corrosion, or pitted surfaces. The keeper (latch) should seal into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper.
- The thimble must be unmovable in the eyes of the splice, and the splice should have no loose or cut strands. The edges must be free of sharp edges, distortion, or cracks.
- Fall protection, which is not in the original package, shall be stored in a clean, dry area

### **Lanyard (shock-absorbing)**

- Begin at one end and work to the opposite end. Slowly rotate the lanyard so the entire circumference is checked. Factory spliced ends require particular attention.
- Lanyard (Webbing) Retractable
- Bend the webbing over a non-lacerating edge, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Swelling, discoloration, cracks, and charring are obvious signs of chemical or heat damage. Closely observe for any breaks in the stitching.

### **Rope**

- Rotation of the rope lanyard while inspecting from end to end will bring to light any fuzzy, worn, broken, or cut fibers. Areas weakened by extreme loads will appear as noticeable change in original diameter. The rope diameter should be uniform throughout, following a short break-in period. Strands should be separated and inspected since the rope may wear on the inside if grit or moisture becomes embedded.
- Storage/Cleaning
- Storage areas shall be maintained as clean, dry and free of exposure to fumes or corrosive elements.
- Cleaning methods established by the manufacturer shall be followed for all components. Generally, the following applies for body harnesses:
- Wipe off surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion
- Wipe the belt dry with a clean cloth. Hang freely to dry but away from excessive heat
- Bolts and other equipment should dry thoroughly without close exposure to heat, steam, or long periods of sunlight
- Mildly dirty cotton may be cleaned normally. For heavy dirt or grease, soak belts in a solution of one tablespoon of grease cutter to one gallon of water. **DO NOT USE A STRONGER SOLUTION.** After soaking, rinse again, then hang to dry



## **Post-Fall or Near-Miss Incidents**

- Fall incidents and near-misses shall be thoroughly investigated to determine root causes and facilitate corrective measures to prevent reoccurrences.
- Employees involved in a fall equal to, or greater than 6' shall be required to receive an immediate medical evaluation.
- All components of a (personal) fall arrest system involved in any fall with a fall distance of over six feet shall be immediately and completely replaced. Such equipment shall be tagged 'out of service' and sent back to the Rapid City office for destruction.

## **Pole Climbing**

### **Orientation**

- An on-site orientation will be conducted for each employee and inspector prior to pole climbing. This orientation will include:
- Climbing with fall protection.
- Rescue procedures.
- Certification as a qualified employee for climbing.
- Fall arrest and protection equipment maintenance and testing.
- Hazard Recognition.

# **FIRST AID PROGRAM**

## **FIRST AID RESPONSIBILITIES**

Project managers and safety representatives are responsible for establishing first aid and medical services for the treatment of occupational injuries and illnesses. In the absence of a safety representative, a Safety Officer or designated representative will assist in completing this activity.

## **FIRST AID TREATMENT**

Provisions shall be made prior to commencement of a project for prompt medical attention in case of serious injury. A written First Aid/ Emergency Action Program, which includes emergency phone numbers at each job site, shall be prepared and implemented on each site by the Safety Department or Project Superintendent.

If prompt medical assistance cannot occur within 3-4 minutes at the worksite BCI will require that at least two (2) employees shall have training from the American Red Cross or equivalent and be available to render emergency first aid.

Personnel who provide first-aid services shall have current certifications from recognized agencies such as the American Red Cross, Heart Association, the National Safety Council, Medic First Aid or equivalent. Under no circumstances shall first-aid trained personnel render medical treatment.

## **TRANSPORTATION**

A representative of BCI is required to be present during the transportation and treatment of company personnel. Proper equipment for prompt transportation of the injured person to a physician or hospital or a communication system for contacting necessary ambulance service shall be provided.

During emergency situations when an employee requires medical treatment for an occupational injury or illness, the local emergency ambulance shall be used to provide transportation for that employee unless other arrangements have been made. In all other cases a representative of BCI will transport personnel to clinics and medical facilities.

## **MODIFIED WORK – LIGHT DUTY POLICY**

It is the policy of BCI provide modified work to persons who have been injured on the job or become ill because of an occupational exposure. Work provided for employees will be compatible with their work restrictions, and will not expose the employee to additional harm or injury.

Employees who are injured or become ill must provide the company with a written medical statement of release from their treating physician or other licensed provider. Upon return to work, this release must be submitted to their supervisor or other authorized company representative prior to being assigned to perform any work.

The policy of BCI is to not schedule persons on modified duty work status to work overtime. Persons who are permitted to return to work on a modified duty status will be scheduled to work their normal work schedule not including any overtime hours they would have normally worked unless the supervisor or other responsible management person directs otherwise.

## **NON-OCCUPATIONAL ILLNESSES OR INJURIES**

Employees who are injured or become ill at home or during non-work hours must provide BCI with a written medical release without restrictions upon returning to work. Employees who have been injured severely or have had a contagious illness must provide BCI with written proof that they have recovered from their condition. If an injury or illness is of a serious nature the Safety Department and Senior Management of BCI must be consulted before a person is permitted to return to work.

## **RETURN-TO-WORK POLICY**

In all cases employees who have sustained an on-the-job injury or illness must provide written medical proof of their condition and ability to perform their work upon their return to work.

### **FIRST AID LOG**

Any injury or illness that is reported to a first-aid facility or medical facility must be recorded on a First-Aid Log form. This includes non-occupational cases and injuries or illnesses treated that involve vendors, suppliers, Contractors/Subcontractors, client personnel, and any other third party. First-Aid Logs or portions of a log are not for general distribution. Requests for such information shall be processed by the Safety Department.

### **MEDICATIONS**

Employees who are taking over-the-counter and prescription medications must report such usage to their immediate supervisor or the Safety Department.

### **FIRST AID KITS**

First aid supplies shall be easily accessible when required. First-aid kits and required contents are maintained in a serviceable condition. Unit-type kits have all items in the first-aid kit individually wrapped, sealed, and packaged in comparable sized packages. The commercial or cabinet-type kits do not require all items to be individually wrapped and sealed, but only those which must be kept sterile. Items such as scissors, tweezers, tubes of ointments with caps, or rolls of adhesive tape, need not be individually wrapped, sealed, or disposed of after a single use or application. Individual packaging and sealing shall be required only for those items which must be kept sterile in a first-aid kit.

BCI will ensure the availability of adequate first-aid supplies, and periodically reassess the demand for supplies and adjust their inventories. For construction operations, first aid kits shall be checked before being sent out to each job and at least weekly.

First-aid kits shall contain at a minimum the following items:

- 10 Package Kit:
  - 1 Pkg. Adhesive bandages, 1" (16 per pkg.)
  - 1 Pkg. Bandage compress, 4" (1 per pkg.)
  - 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
  - 1 Pkg. Triangular bandage, 40" (1 per pkg.)
  - 1 Pkg. Antiseptic soap or pads (3 per pkg.)
  - 5 Pkgs. of consulting physician's choice
  
- 16 Package Kit:
  - 1 Pkg. Absorbent gauze, 24" x 72" (1 per pkg.)
  - 1 Pkg. Adhesive bandages, 1" (16 per pkg.)
  - 1 Pkgs. Bandage compresses, 4" (1 per pkg.)
  - 1 Pkg. Eye dressing (1 per pkg.)
  - 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
  - 2 Pkgs. Triangular bandages, 40" (1 per pkg.)
  - 1 Pkg. Antiseptic soap or pads (3 per pkg.)
  - 7 Pkgs. of consulting physician's choice

- 24 Package Kit:
  - 1 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
  - 2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
  - 2 Pkgs. Bandage compresses, 4" (1 per pkg.)
  - 1 Pkg. Eye dressing (1 per pkg.)
  - 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
  - 6 Pkgs. Triangular bandages (1 per pkg.)
  - 1 Pkg. Antiseptic soap or pads (3 per pkg.)
  - 9 Pkgs. of consulting physician's choice
  
- 36 Package Kit:
  - 4 Pkgs. Absorbent gauze, 24" x 72" (1 per pkg.)
  - 2 Pkgs. Adhesive bandages, 1" (16 per pkg.)
  - 5 Pkgs. Bandage compresses, 4" (1 per pkg.)
  - 2 Pkgs. Eye dressing (1 per pkg.)
  - 1 Pkg. Scissors\* and tweezers (1 each per pkg.)
  - 8 Pkgs. Triangular bandages, 40" (1 per pkg.)
  - 1 Pkg. Antiseptic soap or pads (3 per pkg.)
  - 13 Pkgs. of consulting physician's choice
  - Scissors shall be capable of cutting 2 layers of 15 oz. cotton cloth or its equivalent. The first-aid kits are maintained at the ten, sixteen, twenty-four or thirty-six package level.

Where the eyes or body of any person may be exposed to injurious chemicals and/or materials, suitable facilities for quick drenching or flushing of the eyes and body are provided, within the work area, for immediate emergency use. Where 911 Emergency Services are not available, a poster shall be fastened and maintained either on or in the cover of each first-aid kit and at or near all phones plainly stating, the phone numbers of available doctors, hospitals, and ambulance services within the district of the work site.

## **FIRST AID STATION**

If a fixed establishment employs more than 200 employees at one central location, First-aid stations shall be located as close as practicable to the highest concentration of personnel.

First-aid stations shall be well marked and available to personnel during all working hours.

One person holding a valid first-aid certificate shall be responsible for the proper use and maintenance of the first-aid station.

First-aid stations shall be equipped with a minimum of two first-aid kits, the size of which shall be dependent upon the number of personnel normally employed at the work site. One first-aid kit may be a permanent wall-mounted kit, but in all cases the station shall be equipped with at least one portable first-aid kit.

When required by the circumstances, the station shall be equipped with two wool blankets and a stretcher in addition to first-aid kits.

A roster, denoting the telephone numbers and addresses of doctors, hospitals and ambulance services available to the work site, shall be posted at or near each first-aid station.

First-aid kits shall be checked and maintained (if necessary) every week.

First-aid stations and/or portable first-aid kits used at BCI are located in the job trailers.

# **FORKLIFTS/INDUSTRIAL TRUCKS PROGRAM**

## **MECHANICAL LIFTING**

Mechanical devices must be used for lifting and moving objects that are too heavy or bulky for safe manual handling by employees. Employees who have not been trained must not operate power-driven mechanical devices to lift or move objects of any weight. Heavy objects that require special handling or rigging must be moved only by riggers or under the guidance of employees specifically trained and certified to move heavy objects.

## **INSPECTIONS**

Each mechanical lifting or moving device, including forklifts must be thoroughly inspected by the operator daily (Attachment 18). Each lifting device must also be inspected before lifting a load near its rated capacity. Defective equipment must be repaired before it is used. The rated load capacity of lifting equipment must not be exceeded.

Material moving equipment must be driven forward going up a ramp and driven backward going down a ramp.

Traffic must not be allowed to pass under a raised load.

The floor-loading limit must be checked before mobile lifting equipment enters an area. Passengers must not be carried on lifting equipment unless it is specifically equipped to carry passengers.

## **LOAD PATH SAFETY**

Loads moved with any material handling equipment must not pass over any personnel. The load path must be selected and controlled to eliminate the possibility of injury to employees should the material handling equipment fail.

Equipment worked on while supported by material handling equipment must have a redundant supporting system capable of supporting all loads that could be imposed by failure of the mechanical handling equipment. A suspended load must never be left unattended but must be lowered to the working surface and the material handling equipment secured before leaving the load unattended.

## **TRUCK LOADING**

All objects loaded on trucks must be secured to the truck to prevent any shifting of the load in transit. The wheels of trucks being loaded or unloaded at a loading dock must be chocked and secured to prevent movement. The operator must verify trailer chocks, supports, and dock plates are in place prior to loading/unloading.

## **CLEAN WORK AREAS**

All areas controlled by BCI must be kept in orderly and clean condition and used only for activities or operations for which they have been approved. The following specific rules must also be followed:

- Keep stairs, corridors, and aisles clear. Traffic lanes and loading areas must be kept clear and marked appropriately.
- Store materials in work rooms or designated storage areas only. Do not use hallways, fan lofts, or boiler and equipment rooms as storage areas.
- Do not allow exits, passageways, or access to equipment to become obstructed by either stored materials or materials and equipment that is being used.
- Arrange stored materials safely to prevent tipping, falling, collapsing, rolling, or spreading - that is, any undesired and unsafe motion.
- Do not exceed the rated floor capacity of stored material for the area. The load limit and the maximum height to which material may be stacked must be posted.
- Place materials such as cartons, boxes, drums, lumber, pipe, and bar stock in racks or in stable piles as appropriate for the type of material.
- Store materials that are radioactive, fissile, flammable, explosive, oxidizing, corrosive, or pyrophoric only under conditions approved for the specific use by the Safety Department.
- Segregate and store incompatible materials in separate locations.
- Remove items that will not be required for extended periods from work areas and put them in warehouse storage.

Temporary equipment required for special projects or support activities must be installed so that it will not constitute a hazard. A minimum clearance of 36 inches must be maintained around electrical power panels. Wiring and cables must be installed in a safe and orderly manner, preferably in cable trays. Machinery and possible contact points with electrical power must have appropriate guarding. The controls for temporary equipment must be located to prevent inadvertent actuation or awkward manipulation. When heat-producing equipment must be installed, avoid accidental ignition of combustible materials or touching of surfaces above 60 degrees C (140 F). Every work location must be provided with illumination that meets OSHA requirements. Evaluation of illumination quality and requirements is made by the Safety Department, but the supervisor of an area is responsible for obtaining and maintaining suitable illumination.

Areas without natural lighting and areas where hazardous operations are conducted must be provided with enough automatically activated emergency lighting to permit exit or entry of personnel if the primary lighting fails.

## **OSHA STANDARDS FOR FORKLIFTS**

Forklift users must familiarize themselves with and comply with OSHA Standard 29 CFR 1910.178 and ANSI B56.1. In particular, the Safety Department shall verify that only trained and certified operators, including supervisors, are allowed to operate any powered industrial truck (forklift).

## **TRAINING**

All forklift training shall include formal instruction, practical training and operator evaluation in the workplace, (i.e. lecture, discussion, interactive computer learning, videos, and written materials; practical training involves instructor demonstrations and trainee exercises; operator evaluation - critiques required), and shall address all 23 elements listed in CFR 1910.178, including, but not limited to: load capacity, operating instructions, controls, distance, differences between cars vs. PITs, load capacity, refueling or recharging procedures, ramps, visibility, stability, balance/counterbalance points, etc. All trainers must have the knowledge and ability to teach and evaluate operators. Employer certification (Attachment 44) must include operator name, training date, evaluation date, and trainer/evaluator name. Operators shall have this certification training at their initial assignment, and every three (3) years thereafter. This refresher training will be held immediately if unsafe operations are observed; an accident occurs; a different vehicle type is introduced, or any changes in conditions.

Modifications and additions must not be performed by the customer or user without manufacturer's prior authorization or qualified engineering analysis. Where such authorization is granted, capacity, operation and maintenance instruction plates, tags, or decals must be changed accordingly.

If the forklift truck is equipped with front end attachments other than factory installed attachments, the user must ensure that the truck is marked with a card or plate that identifies the current attachments, shows the approximate weight of the truck with current attachments and shows the lifting capacity of the truck with current attachments at maximum lift elevation with load laterally centered.

The user must see that all nameplates and caution and instruction markings are in place and legible. The user must consider that changes in load dimension may affect truck capacities.

## **FORKLIFT MAINTENANCE**

Because forklift trucks may become hazardous if maintenance is neglected or incomplete, procedures for maintenance must comply with ANSI B56.1 Section 7 and OSHA Standard 29 CFR 1919.178 (g).

## **FORKLIFT EXTENSION**

Maximum efficiency, reliability, and safety require that the use of fork extensions be guided by principles of proper application, design, fabrication, use, inspection, and maintenance. The user must notify the Safety Department before purchasing extensions or having them fabricated.

Fork extensions are only appropriate for occasional use. When longer forks are needed on a regular basis, the truck should be equipped with standard forks of a longer length.

Routine on-the-job inspections of the fork extension must be made by the fork lift operator before each use unless, in the judgment of the supervisor, less frequent inspections are reasonable because of his or her knowledge of its use since the last inspection. Extensions must be inspected for evidence of bending, overload, excess corrosion, cracks, and any other deterioration likely to affect their safe use.

All fork extensions must be proof load tested to establish or verify their rated capacities, whether they were supplied commercially or fabricated at BCI. A load equal to the rated capacity of the pair at a particular load center multiplied by 1.15 must be placed on each fork extension pair and fork assembly and supported for a period of five minutes without any significant deformation. Rated capacity must be determined at significant load centers, including the midpoint of the extension and at the tip. Once determined, the rated capacity and load center information must be shown by stamping or tagging the extensions in a protected location of low stress. The proof load test must be witnessed by a mechanical engineer or designer.

Whenever evidence of deterioration is detected or whenever the extensions have been overloaded, magnetic particle inspection must be performed.

# GENERAL WASTE MANAGEMENT PROGRAM

This program outlines administrative and procedural requirements for construction waste management activities on our construction site projects. BCI estimates the waste that will be generated prior to work being performed so that the need for containers and waste removal, if necessary, can be determined. Typically on our projects the same wastes or scrap materials are generated for every project.

## DEFINITIONS

**Construction, Demolition, and Land clearing (CDL) Waste:** Includes all non-hazardous solid wastes resulting from construction, remodeling, alterations, repair, demolition and land clearing. Included are materials that are recycled, reused, salvaged or disposed as garbage.

**Salvage:** Recovery of materials for on-site reuse or donation to a third party.

**Reuse:** Making use of a material without altering its form. Materials can be reused on-site or reused on other projects off-site. Examples include, but are not limited to the following: Grinding of concrete for use as sub base material and chipping of land clearing debris for use as mulch.

**Recycling:** The process of sorting, cleaning, treating, and reconstituting materials for the purpose of using the material in the manufacture of a new product.

**Source-Separated CDL Recycling:** The process of separating recyclable materials in separate containers as they are generated on the job-site. The separated materials are hauled directly to a recycling facility or transfer station.

**Co-mingled CDL Recycling:** The process of collecting mixed recyclable materials in one container on-site. The container is taken to a material recovery facility where materials are separated for recycling.

**Approved Recycling Facility:** A facility that can legally accept CDL waste materials for the purpose of processing the materials into an altered form for the manufacture of a new product.

**Material Recovery Facility:** A general term used to describe a waste-sorting facility. Mechanical, hand-separation, or a combination of both procedures are used to recover recyclable materials.

## CONSTRUCTION WASTE MANAGEMENT, GENERAL

Waste materials should be properly stored and handled to minimize the potential for a spill or impact to the environment. During outdoor activities, receptacles must be covered to prevent dispersion of waste materials and to control the potential for run-off.

Provide containers for CDL waste that is to be recycled clearly labeled as such with a list of acceptable and unacceptable materials. The list of acceptable materials must be the same as the materials recycled at the receiving material recovery facility or recycling processor.

Provide containers for CDL waste that is disposed in a landfill clearly labeled as such.

If possible, include in material purchasing agreements a waste reduction provision requesting that materials and equipment be delivered in packaging made of recyclable material, that they reduce the amount of packaging, that packaging be taken back for reuse or recycling, and to take back all unused product. Insure that subcontractors require the same provisions in their purchase agreements.

Conduct regular visual inspections of dumpsters and recycling bins to remove contaminants.



CDL waste materials that can be salvaged, reused or recycled include, but are not limited to, the following:

- Acoustical ceiling tiles Asphalt
- Asphalt shingles Cardboard packaging Carpet and carpet pad Concrete
- Drywall
- Fluorescent lights and ballasts
- Land clearing debris (vegetation, stumpage, dirt) Metals
- Paint (through hazardous waste outlets) Wood
- Plastic film (sheeting, shrink wrap, packaging) Window glass
- Wood
- Field office waste, including office paper, aluminum cans, glass, plastic, and office cardboard.

Employees must be instructed on the proper disposal method for wastes. This may include general instruction on disposal of non-hazardous wastes, trash, or scrap materials. If wastes generated are classified as hazardous, employees must be trained to ensure proper disposal. The Safety Department or a designated representative will determine what level, if any, of HazWoper (hazardous waste operations) training is required.

### **SOURCE SEPARATION**

BCI encourages proper segregation of waste materials to ensure opportunities for reuse or recycling. Separate recyclable materials from CDL waste to the maximum extent possible. Separate recyclable materials by type.

Provide containers, clearly labeled, by type of separated materials or provide other storage method for managing recyclable materials until they are removed from Project site.

Stockpile processed materials on-site without intermixing with other materials. Place, grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

Stockpile materials away from demolition area. Do not store within drip line of remaining trees.

Store components off the ground and protect from weather.

- **CO-MINGLED RECYCLING**
  - Do not put CDL waste that will be disposed in a landfill into a co-mingled CDL waste recycling container.
- **REMOVAL OF CONSTRUCTION WASTE MATERIALS**
  - Remove CDL waste materials from project site on a regular basis. Do not allow CDL waste to accumulate on-site.
  - Transport CDL waste materials off Owner's property and legally dispose of them.
  - Burning of CDL waste is not permitted unless specifically authorized by the site owner and complies with all laws.

# HAND AND POWER TOOL

The objective of the BCI Hand and Power Tool Safety Program is to provide a safe and healthy work environment and to comply with the Occupational Safety and Health Administration's (OSHA) Hand and Power Tools Standards. Our policy is to take a proactive approach in identifying hazards, providing proper tool selection options and providing all necessary training for all affected employees. This policy, while written in adherence with OSHA regulations, should not be considered a substitute for any provisions or standards of OSHA.

This program applies to all work operations where employees use or perform work near someone who uses hand and power tools. Every field and shop employee will participate in the Hand and Power Tool Safety Program. Copies of the program are available upon request for review by all employees.

## ASSIGNMENT OF RESPONSIBILITIES

### PROGRAM ADMINISTRATOR

The Safety Department will manage the Hand and Power Tool Safety Program for BCI, maintain all records pertaining to the plan, including reviewing and updating this plan as necessary and facilitate training.

### MANAGEMENT

BCI will ensure that each employee understands and follows the Hand and Power Tool Safety Program through employee orientation, job hazard assessments, training, job performance reviews and disciplinary action. BCI will provide all necessary information, equipment and personnel to comply with this program.

### SUPERVISORS

Supervisor will be capable of identifying existing and predictable hazards in the work area or working conditions which are hazardous or dangerous to employees. Supervisor has authorization to take prompt corrective measures to eliminate such hazards or conditions. Supervisor will work with the Safety Department to determine the appropriate PPE needed for the work area and ensure its proper use. Supervisor will be responsible for ensuring that their employees are properly trained before allowing any work to start or continue that involves the use of hand and power tools.

### EMPLOYEES

Employees share the responsibility for employing proper work practices and to use and maintain all hand and power tools and other equipment and systems in the correct manner.

### JOB HAZARD ASSESSMENT

Proper planning is the best tool for keeping employees safe on the job. A hazard assessment should be performed for all work areas. It is important that management, supervisors and employees are all involved in the assessment process. The assessment should include, but not be limited to, the following elements:

- Evaluation of the worksite
- Evaluation of the work/job to be done
- Evaluation of the various tools and equipment to be used
- Identify affected employees
- The assessment will provide information that will help:
  - Determine the possible use of administrative and engineering controls;
  - Determine the need for PPE;
  - Determine training needs; and
  - Determine emergency/medical response needs.

When changes in the work area are made, the need for additional hazard assessments might be necessary. The Safety Department will be responsible for determining this need.

## **GENERAL SAFETY RULES**

The safety of all employees is the driving factor behind all safety training, rules, procedures and regulations. Employees, supervisors and management of BCI should work together to establish a safe working environment. Any unsafe working condition or tool should immediately be reported to your supervisor. Unsafe working conditions must be corrected before work continues. Each tool used has particular rules of use and manufacturer's guidelines must be followed for each individual tool. Some general safety rules that apply to all hand and power tools are listed below.

- Keep tools in good working condition through regular maintenance.
- Use the right tool for the job.
- Inspect tools for damage before use. Damaged tools should be removed from use and tagged or locked out until repaired or destroyed and discarded.
- Use tools according to the Manufacturer's guidelines.
- Use appropriate Personal Protective Equipment (PPE).
- Keep floors and work areas clean and dry to prevent slips, trips and falls and other accidents.

## **PERSONAL PROTECTIVE EQUIPMENT**

Employees should inspect all PPE before work begins and/or each use. Periodic inspections will be performed by the supervisor. Inspect for any damage, wear, corrosion or other safety issue that could affect the proper function of the PPE. Remove all defective or questionable equipment from use immediately and mark as unusable. Equipment should not be returned to use until such equipment has been inspected by the supervisor or the manufacturer and deemed safe and usable. Proper care and maintenance of the equipment will increase the life of the equipment. Refer to the manufacturer's guidelines for correct cleaning and storage rules. If there are questions concerning inspections, maintenance, or storage, ask your supervisor for assistance.

## **TRAINING**

The Safety Department is responsible for ensuring that all program elements and training are carried out. All affected employees will receive initial training on OSHA's Hand and Power Tool Standard and this policy before starting work. Training on the various tools used at BCI will be provided as needed. Training will be interactive and will enable each employee to recognize the various hazards associated with hand and power tools, procedures to be followed in order to minimize these hazards and proper use and maintenance of PPE. Training records shall be maintained in the Safety Department offices and shall contain the name of the employee trained, date(s) of training and signature of the Safety Officer. Circumstances where retraining is required include, but are not limited to, situations where:

- Changes to the workplace render previous training obsolete;
- Changes in the types of tools, equipment or PPE used changes; or
- The employees' knowledge or use of tools, equipment or PPE indicates that the employee has not retained the required understanding or skill.

## **EMERGENCY/MEDICAL RESPONSE**

BCI is committed to the safety of all employees. Emergency/Medical plans for each work area will be created and implemented by the Safety Department and the supervisor. The plan will provide for adequate first aid kits, prompt medical attention for employees in the event of an accident, and other safety measures as deemed necessary.

## **ACCIDENT REPORT**

In the event of an accident, an Accident Report Form, (Attachment 4) must be completed and returned to the Safety Department by the employee involved in the accident and the supervisor.

## **OUTSIDE CONTRACTORS**

All outside contractors will be required to follow this policy and utilize the appropriate hand and power tool safety protection measures as determined by the Safety Department. Outside contractors will be informed of these requirements during initial contract discussion.

## **POLICY EVALUATION**

The hand and power tool safety program will be evaluated on an annual basis to determine its effectiveness and need for change. Items to be reviewed for this purpose include but are not limited to:

- OSHA guidelines
- Job Hazard Assessments
- Training Records
- Accident Reports
- Changes in Equipment

# HAZARD COMMUNICATION PROGRAM

## Introduction

About 32 million workers are potentially exposed to one or more chemical hazards. There are an estimated 575,000 existing chemical products, and hundreds of new ones are being introduced annually. This poses a serious problem for exposed workers and their employers. Chemical exposure may cause or contribute to many serious health effects such as heart ailments, kidney and lung damage, sterility, cancer, burns, and rashes. Some chemicals may also be safety hazards and have the potential to cause fires and explosions and other serious accidents.

Because of the seriousness of these safety and health problems, and because many employers and employees know little or nothing about them, the Occupational Safety and Health Administration (OSHA) issued, in 1983, a rule called “Hazard Communication” that applies to employers in the manufacturing sector industry. The scope of the rule was expanded in 1987 to include employers in the non-manufacturing (including construction) sector.

The basic goal of the standard is to ensure that employers and employees know about chemical hazards and how to protect themselves. This knowledge, in turn, should help to reduce the incidence of chemical source illnesses and injuries.

The Hazard Communication Standard establishes uniform requirements to assure that the hazards of all chemicals imported into, produced or used in U.S. workplaces are evaluated, and that the resultant hazard information and associated protective measures are transmitted to affected employers and potentially exposed employees.

Chemical manufacturers and importers must convey the hazard information they learn from their evaluations to downstream employers by means of labels on containers and Safety Data Sheets (SDS’s). In addition, all covered employers must have a Hazard Communication Program (Attachment 20) to get this information to their employees through labels or containers, from SDS’s, and training.

This program ensures that BCI receives the information they need to inform and train their employees properly and to design and put in place employee protection programs. It also provides necessary hazard information to employees, so they can participate in, and support, the protective measures in place at their workplaces.

## FIVE PRELIMINARY STEPS TO COME INTO COMPLIANCE

(To be performed by the Safety Department or designated agents(s).)

- Read the standard.
  - Make sure you understand the provisions of the standard.
- Know your responsibility as an employer.
  - List the hazardous chemicals in the workplace.
  - Walk around the workplace, read all container labels, and list the identity of all materials that may be hazardous; the manufacturer’s product name, location, and telephone number; and the work area where the product is used. Be sure to include hazardous chemicals that are generated in the work operation but are not in a container (e.g., welding fumes).
  - Review your list and determine whether any substances are exempt.
  - Establish a file on hazardous chemicals used in your workplace, and include a copy of the latest SDS’s, and any other pertinent information.
  - Develop procedures to keep your list current. When new chemicals are used, add them to your list.

- Obtain Safety Data Sheets for all chemical substances.
  - If you do not have an SDS for a hazardous substance in your workplace, request a copy from the chemical manufacturer, or distributor as soon as possible. An SDS must accompany or precede the shipment and must be used to obtain identifying information such as the chemical name and the hazards of a particular substance.
  - Review each SDS to be sure that it is complete and clearly written. The SDS must contain the following:
    - Physical and chemical properties of a substance.
    - Physical and health hazards.
    - Routes of exposure.
    - Precautions for safe handling and use.
    - Emergency and first-aid procedures.
    - Control measures.
  - If the SDS is incomplete or unclear, contact the manufacturer or distributor to get clarification of the missing information.
  - Make sure the SDS is available to employees, designated representatives, and to the Assistant Secretary for Occupational Safety and Health.
- Make sure that all containers are labeled.
  - The manufacturer, importer, or distributor is responsible for labeling containers, but BCI must adhere to the following:
  - Ensure that containers of hazardous substances in the workplace are labeled, tagged or marked and include the identity of the hazardous chemical, and the appropriate hazard warnings. Container labels for purchased chemicals must also include the name and address of the chemical manufacturer, importer, or other responsible party.
  - Check all incoming shipments of hazardous chemicals to be sure they are labeled.
  - If a container is not labeled, obtain a label or the label information from the manufacturer, importer, or other responsible party or prepare a label using information obtained from these sources. Employers are responsible for ensuring that containers in the workplace are labeled, tagged, or marked.
  - Do not remove or deface existing labels on containers unless the container is immediately marked with the required information.
  - Instruct employees on the importance of labeling portable containers into which they have poured hazardous substances. If the portable container is for their immediate use, then the container does not have to be labeled.
- Develop and implement a written hazard communication program.
  - This program must include the following:
  - Container labeling and other forms of warnings.
  - Safety Data Sheets.
  - Employee training based on the list of chemicals, SDS's, and labeling information.
  - Methods for communicating hazards and protective measures to employees and others (such as other contractors or subcontractors onsite).

# HAZARD COMPLIANCE CHECKLIST

(To be performed by a Responsible Safety Officer or designated agents(s).)

	Yes	No
1. Listed all of the hazardous chemicals in our workplace.	_____	_____
2. Established a file for information on hazardous chemicals.	_____	_____
3. Obtained an SDS for each hazardous chemical in use.	_____	_____
4. Developed a system to ensure that all incoming hazardous chemicals are labeled.	_____	_____
5. Reviewed each SDS to be sure it is complete.	_____	_____
6. Made sure that SDS's are available where necessary.	_____	_____
7. Developed a written hazard communication program.	_____	_____
8. Developed a method to communicate hazards to employees and others (contractors and subcontractors).	_____	_____
9. Informed employees of protective measures for hazardous chemicals used in the workplace.	_____	_____
10. Alerted employees to other forms of warning that may be used.	_____	_____

## GENERAL POLICY OF BCI

The purpose of this notice is to inform you that BCI is complying with the OSHA Hazard Communication Standard, Title 29 Code of Federal Regulations 1910.1200, by the following actions:

- Compiling a hazardous chemicals list.
- By using SDS's.
- By ensuring that containers are labeled.
- By providing you, the employee with training.
- The program applies to all work operations in BCI where you may be exposed to hazardous substances under normal working conditions or during an emergency situation.
- The Safety Department will be the program coordinator who has overall responsibility for the program. The Safety Department will review and update the program, as necessary.
- Copies of the written program may be obtained from the Safety Department.
- Under this program, you will be informed of the following items:
  - The Hazard Communications Standard.
  - The hazardous properties of chemicals with which you work.
  - Safe handling procedures.
  - Measures to take to protect yourself from these chemicals.
  - Hazards associated with non-routine tasks.
  - Hazards associated with unlabeled containers.

## **List of Hazardous Chemicals**

The Safety Department will make a list of all hazardous chemicals and related work practices used in the facility and on jobsites, and will update the list as necessary. Our master list of chemicals and substances identifies all chemicals and substances used throughout our work areas. SDS's for your particular jobsite will be located in the job trailer. The master list of chemicals and substances will be maintained by the Safety Department and is available for review.

## **Safety Data Sheets (SDS's)**

SDS's provide you, the employee with specific information on the chemicals you use. The Safety Department will maintain a binder with an SDS on every chemical or substance used by BCI. The SDS will be a fully completed OSHA Form 174 or equivalent. The Safety Department will ensure that the shop and each jobsite maintain the appropriate SDS's for that area. SDS's will be made readily available to you during normal working hours.

The Safety Department is responsible for acquiring and updating SDS's. He will contact the chemical manufacturer or vendor if additional research is necessary or if an SDS has not been supplied with an initial shipment. All new procurements for the company must be cleared by the Safety Department. The master list of chemicals and substances is available for review from the Safety Department.

## **Labels and Other Forms of Warning**

The Safety Department will ensure that all hazardous chemicals used in the facility and on jobsites are properly labeled and updated as necessary. Labels shall be legible, and in English, however, for non-English speaking employees, information shall be presented in their language as well. Labels should list at least the following items:

- The chemical identity.
- The appropriate hazard warnings.
- The name and address of the manufacturer, importer, or other responsible party.

The Safety Department or your immediate supervisor will refer to the corresponding SDS to assist you in verifying label information. Containers shipped from the shop or central office will be checked to make sure all containers are properly labeled. Words, pictures, symbols or combinations thereof can be used. Examples of labeling systems shall be incorporated into the program. Examples of labeling systems might be NFPA, DOT, or the new HMIS system.

If you transfer chemicals from a labeled container to a portable container that is intended for immediate use, no labels are required on the portable container. These portable containers shall not be allowed to remain in any work or storage areas overnight without emptying or labeling to prevent another person from coming in contact with the portable container.

## **Non-Routine Tasks**

When you are required to perform hazardous, non-routine tasks (such as entering confined spaces), a special training session will be conducted to inform you of the hazardous chemicals to which you might be exposed and the proper precautions to take to reduce or avoid exposure.

## **Training**

Anyone who works with or is potentially exposed to hazardous chemicals will receive initial training on the Hazard Communication Standard (Attachment 20) and the safe use of those hazardous chemicals by the Safety Department, or a designated representative. This training shall be performed for present workers and for new hires at the time of their initial assignment. The training program may use classroom style training materials and/ or audiovisual aids. Whenever a new chemical is introduced, additional training (informal if appropriate) will be provided. Regular safety meetings conducted, and the RSO or a designated representative will also be used to review the information presented in the initial training. Foremen and other supervisors will be trained regarding jobsite hazards and appropriate protective measures so



they will be able to answer questions from you and/ or other employees and to provide daily monitoring of safe work practices.

The training plan will emphasize these items:

- A summary of the OSHA Standard and details of this written program, including an explanation of the labeling system and SDS's and how employees can obtain and use the appropriate hazard information.
- Chemical and physical properties of hazardous materials (e.g. flash point, reactivity) and methods that can be used to detect the presence or release of chemicals.
- Physical hazards of chemicals (e.g. potential for fire, explosion, etc.).
- Any operation in their work area where hazardous chemicals are present.
- Physical and health hazards, including signs and symptoms of exposure, associated with exposure to chemicals in the workplace, and any medical condition known to be aggravated by exposure to the chemical.
- Methods and observations that may be used to detect the presence or release of hazardous chemicals by use of monitoring devices, visual appearance or odor.
- Procedures and appropriate work practices to protect against hazards.
- Personal protective equipment required
- Proper use and maintenance of personal protective equipment
- Work practices, or methods to assure proper use and handling of chemicals
- Procedures for emergency response.
- Work procedures to follow to assure protection when cleaning hazardous chemical spills and leaks, or other emergency procedures.
- Where the Hazard Communication Program, any applicable Lists of Chemicals, and SDS's are located, how to read and interpret the information on both labels and SDS's, and how employees may obtain additional information.

#### **Other Employers – Multi-Employer Jobsites and/or Worksites**

The Responsible Safety Officer upon notification, will either meet with or have a designated agent meet with other contractors, subcontractors, or any other applicable parties on jobsites to discuss the following items:

- Chemical hazards that may be encountered in the normal course of our work on the premises.
- The labeling system that is in use.
- The protective measures to be taken by our employees.
- The safe handling procedures to be used by our employees.
- The location of the SDS's.

In addition, each contractor bringing chemicals on-site must provide BCI with the appropriate hazard information on these substances, the labels used, the precautionary measures to be taken in working with these chemicals, and the location of the SDS's.

#### **Additional information**

All employees, or their designated representatives, can obtain further information on this written program, the Hazard Communication Standard, applicable SDS's, and chemical information lists from the Responsible Safety Officer.

## **Guidelines for Identifying and Listing Hazardous Chemicals**

(To be performed by the Responsible Safety Officer or designated agents(s).)

### **How to Identify Hazardous Chemicals**

The responsibility for determining whether a chemical is hazardous lies with the chemical manufacturer or importer of a chemical. As a user of chemicals, BCI may rely on the evaluation received from these suppliers through labels on containers and Material Safety Data Sheets (MSDS's). To prepare a list of chemicals in our facility that is covered by the rule, walk around and write down the names of chemicals that have a label indicating a potential hazard (e.g. "flammable", "inflammable", "causes skin irritation"). Don't limit yourself to chemicals in containers, however. Be aware of substances generated in work operations such as fumes or dust as these may be covered too.

### **Chemicals Considered Hazardous:**

Those regulated by OSHA in 29 CFR Part 1926, Subpart Z, Toxic and Hazardous Substances.

Those included in the American Conference of Governmental Industrial Hygienists (ACGIH) latest edition of Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment.

Those found to be suspected or confirmed carcinogens by the National Toxicology Program in the latest edition of the Annual Report on Carcinogens.

Those found to be suspected or confirmed carcinogens by the International Agency for Research on Cancer (IARC) in the latest edition of IARC Monographs.

Once you have complete list of chemicals, you'll want to review it to determine if any of the items are exempted. In paragraph (b) (6) of the Hazard Communication Standard, OSHA has listed a number of items that are excluded. For example, rubbing alcohol maintained in a first-aid station would be exempt under paragraph (b) (6) (vi) because it's intended for personal use by employees. To be prudent, some employers include all chemicals even if they are exempted. In general, if there is any question regarding a chemical, it's best to include that chemical in the Hazard Communication Program.

### **How to List Chemicals in the Workplace**

All hazardous chemicals known to be present in your workplace should be listed using an identity that appears on the appropriate SDS and label for the chemical. The list may also include common or trade names, Chemical Abstract Service (CAS) registry numbers, SDS reference numbers, etc. The list can be compiled for the entire company's work areas, or for individual shop or jobsites.

The list is to be an inventory of everything for which a SDS must be obtained. It will be part of the written program, and must be available to employees upon request.

### **Company List of Hazardous Chemicals and SDS Index**

The listing of all chemical being used may be located at MSDS Online ([www.msds-online.com](http://www.msds-online.com))

## SDS Guidelines

The Safety Data Sheet (SDS) is a detailed information bulletin prepared by the manufacturer or importer of a chemical that describes the physical and chemical properties, physical and health hazards, routes of exposure, precautions for safe handling and use, emergency and first-aid procedures, and control measures. Information on an SDS aids in the selection of safe products and helps and prepare BCI and you, the employee to respond effectively to daily exposure situations as well as emergency situations.

The SDS's are a comprehensive source of information for all types of employers. Therefore there may be information on the MSDS that is not particularly useful to you or not important to the safety and health in your operation. Concentrate on the information that is applicable to your situation. Generally, hazard information and protective measures should be the focus of your concern.

This Hazardous Communications Program contains a glossary of terms used on SDS's. You may find this helpful in reading and understanding SDS's.

### OSHA Requirements

BCI maintains a complete and accurate SDS for each hazardous chemical that is used in the shop and on jobsites. All employers are entitled to receive SDS's automatically upon purchase of the material. When new and significant information becomes available concerning a product's hazards or ways to protect against the hazards, chemical manufacturers, importers, or distributors must add to their SDS within three months and provide it to their customers with the next shipment of chemical. BCI has an SDS for each hazardous chemical used in the workplace. When there are multiple suppliers of the same chemical, only one SDS is retained.

While SDS's are not required to be physically attached to a shipment, they must accompany or precede the shipment. When the manufacturer or supplier fails to send an SDS with a shipment labeled as a hazardous chemical, BCI will obtain one from the manufacturer or supplier as soon as possible. Similarly, if the SDS is incomplete, or unclear, BCI will contact the manufacturer or supplier to get clarification or obtain missing information as soon as possible.

If BCI cannot obtain an SDS from a manufacturer or supplier a written complaint shall be sent to the nearest OSHA area office. OSHA will then, at the same time, call and send a certified letter to the manufacturer or supplier to obtain the needed information. If the manufacturer or supplier still fails to respond within a reasonable time, OSHA will inspect the manufacturer or supplier and take appropriate enforcement action.

### Sections of an SDS and Their Significance

OSHA specifies the information to be included in an SDS, but does not prescribe the precise format for an SDS. An explanation for each section of an SDS form follows. The SDS must be in English and must include at least the following information:

#### Section I. Chemical Product and Company Identification

- The chemical and common name(s) must be provided for chemical substances.
- An identity on the SDS must be cross-referenced to the identity found on the label.
- The manufacturer's name, address, and emergency information telephone number.
- The date prepared and the signature of the preparer.

#### Section II. Composition/information on Ingredients

- Substances
- CAS Number

Section III. Hazard Identification

- Acute Health Hazard
- Chronic Health Hazard
- Notes

Section IV. First-Aid Measures

- First Measures based on exposure type

Section V. Fire-Fighting Measures

- The compound's potential for fire and explosion must be described, such as:
  - Flash Point (in Degrees)
  - Lower Explosive Limit (LEL) The minimum concentration of a substance in the air which can be ignited.
  - Upper Explosive Limit (UEL) The maximum concentration of a substance in the air which can continue to support fire.

Extinguishing Agents- In accordance with the following table:

Type of Fire	Extinguishing Agent
Class A- Wood, Paper, Cloth	Water
Class B- Flammable/ Combustible Liquids	Carbon Dioxide, Dry Chem, Foam
Class C- Electrical	Carbon Dioxide, Dry Chem
Class D- Combustible Metals	Special Compounds

- Special Fire or Explosion Characteristics
- Special Fire Extinguishing Methods- such as if substances will re-ignite, etc.
- Also, the fire hazards of the chemical and the conditions under which it could ignite or explode must be identified. Recommended extinguishing agents and fire-fighting methods must be described

Section VI. Accidental Release Measures

- Personal Precautionary Measures
- Environment Precautionary Measures
- Cleaning/Absorption

Section VII. Handling and Storage

- Handling Precaution
- Storage Information

Section VIII. Exposure Controls/Personal Protection

- Engineering Controls
- Personal Protective Equipment
- Other Precautions

## Section IX. Physical and Chemical Properties

The physical and chemical characteristics of the hazardous substance must be listed. These may include items such as:

- Boiling, Melting, and Freezing Points (in degrees)
- Vapor Density- (in numerical values)
- Vapor pressure (in mm Hg)
- Specific Gravity
- Solubility
- The product's general appearance and odor.
- These characteristics provide important information for designing safe and healthful work practices.

## Section X. Stability and Reactivity

- Stability Data
- Conditions to Avoid
- Incompatibility
- Hazardous Decomposition PRODUCTS
- Additional Guidelines

## Section XI. Toxicological Information

- Principle Route of Exposure
- Chronic Effects
- Carcinogenicity
- Toxicity Testing Results

## Section XII. Ecological Information

- Mobility
- Persistence
- Bio-accumulation
- Eco toxicological Information
- Chemical Fate
- Other information

## Section XIII. Disposal Considerations

- Disposal Method
- Contaminated Packaging

## Section XIV. Transport Information

- Land Transportation Methods
- Air Transportation Methods
- Sea Transportation Methods
- Other Transportation Information

## Section XV. Regulatory Information

- US Regulations
- State Regulation
- International Regulation

## Section XVI. Other Information

## SDS Checklist

BCI ensures that each SDS contains the following information:

1. Product or chemical identity used on label. \_\_\_\_\_
2. Manufacturer's name and address. \_\_\_\_\_
3. Chemical and common names of each hazardous ingredient. \_\_\_\_\_
4. Name, address, and phone number for hazardous and emergency information. \_\_\_\_\_
5. Preparation or revision date. \_\_\_\_\_
6. The hazardous chemical's physical and chemical characteristics, such as vapor, pressure, and flashpoint. \_\_\_\_\_
7. Potential physical hazards, (i.e. fire, explosion, and reactivity). \_\_\_\_\_
8. Known health hazards. \_\_\_\_\_
9. OSHA Permissible Exposure Limit (PEL), ACGIH Threshold Limit Value (TLV) or other exposure limits. \_\_\_\_\_
10. Emergency and first-aid procedures. \_\_\_\_\_
11. Whether OSHA, NTP, or IARC lists the ingredient as a carcinogen. \_\_\_\_\_
12. Precautions for safe handling and use. \_\_\_\_\_
13. Control measure such as engineering controls, work practices, hygiene practices or personal protective equipment required. \_\_\_\_\_
14. Primary routes of entry. \_\_\_\_\_
15. Procedures for spills, leaks, and cleanup. \_\_\_\_\_

## TRAINING PROGRAM GUIDELINES

### INTRODUCTION

The Occupational Safety and Health Act of 1970 does not address specifically the responsibility of employers to provide health and safety information and instruction to employees, although Section 5(a)(2) does require that each employer "...shall comply with occupational safety and health standards promulgated under this Act." However, more than 100 of the Act's current standards do contain training requirements.

Therefore, the Occupational Safety and Health Administration has developed voluntary training guidelines to assist employers in providing the safety and health information and instruction needed for their employees to work at minimal risk to themselves, to fellow employees, and to the public.

The guidelines are designed to help employers to:

- Determine whether a worksite problem can be solved by training
- Determine what training, if any, is needed
- Identify goals and objectives for the training
- Design learning activities
- Conduct training
- Determine the effectiveness of the training
- Revise the training program based on feedback from employees, supervisors, and others.

The development of the guidelines is part of an agency-wide objective to encourage cooperative, voluntary safety and health activities among OSHA, the business community, and workers. These voluntary programs include training and education, consultation, voluntary protection programs, and abatement assistance.

### **TRAINING MODEL**

The guidelines provide employers with a model for designing, conducting, evaluating, and revising training programs. The training model can be used to develop training programs for a variety of occupational safety and health hazards identified at the workplace. Additionally, it can assist employers in their efforts to meet the training requirements in current or future occupational safety and health standards.

A training program designed in accordance with these guidelines can be used to supplement and enhance the employer's other education and training activities. The guidelines afford employers significant flexibility in the selection of content and training program design. OSHA encourages a personalized approach to the informational and instructional programs at individual worksites, thereby enabling employers to provide the training that is most needed and applicable to local working conditions. Assistance with training programs or the identification of resources for training is available through such organizations as OSHA full-service Area Offices, State agencies which have their own OSHA-approved occupational safety and health programs, OSHA-funded State onsite consultation programs for employers, local safety councils, the OSHA Office of Training and Education, and OSHA-funded New Directions grantees.

### **REVIEW COMMISSION IMPLICATIONS**

OSHA does not intend to make the guidelines mandatory. And they should not be used by employers as a total or complete guide in training and education matters which can result in enforcement proceedings before the Occupational Safety and Health Review Commission. However, employee training programs are always an issue in Review Commission cases which involve alleged violations of training requirements contained in OSHA standards.

The adequacy of employee training may also become an issue in contested cases where the affirmative defense of unpreventable employee misconduct is raised. Under case law well established in the Commission and the courts, an employer may successfully defend against an otherwise valid citation by demonstrating that all feasible steps were taken to avoid the occurrence of the hazard, and that actions of the employee involved in the violation were a departure from a uniformly and effectively enforced work rule of which the employee had either actual or constructive knowledge.

In either type of case, the adequacy of the training given to employees in connection with a specific hazard is a factual matter which can be decided only by considering all the facts and circumstances surrounding the alleged violation. The general guidelines presented here are not intended, and cannot be used, as evidence of the appropriate level of training in litigation involving either the training requirements of OSHA standards or affirmative defenses based upon employer training programs.

## **TRAINING GUIDELINES**

OSHA's training guidelines follow a model that consists of:

- Determining if Training is needed
- Identifying Training Needs
- Identifying Goals and Objectives
- Developing Learning Activities
- Conducting the Training
- Evaluating Program Effectiveness
- Improving the Program

The model is designed to be one that even the owner of a business with very few employees can use without having to hire a professional trainer or purchase expensive training materials. Using this model, employers or supervisors can develop and administer safety and health training programs that address problems specific to their own business, fulfill the learning needs of their own employees, and strengthen the overall safety and health program of the workplace.

### **DETERMINING IF TRAINING IS NEEDED**

The first step in the training process is a basic one: to determine whether a problem can be solved by training. Whenever employees are not performing their jobs properly, it is often assumed that training will bring them up to standard. However, it is possible that other actions (such as hazard abatement or the implementation of engineering controls) would enable employees to perform their jobs properly.

Ideally, safety and health training should be provided before problems or accidents occur. This training would cover both general safety and health rules and work procedures, and would be repeated if an accident or near-miss incident occurred.

Problems that can be addressed effectively by training include those that arise from lack of knowledge of a work process, unfamiliarity with equipment, or incorrect execution of a task. Training is less effective (but still can be used) for problems arising from an employee's lack of motivation or lack of attention to the job. Whatever its purpose, training is most effective when designed in relation to the goals of the employer's total safety and health program.

### **IDENTIFYING TRAINING NEEDS**

If the problem is one that can be solved, in whole or in part, by training, then the next step is to determine what training is needed. For this, it is necessary to identify what the employee is expected to do and in what ways, if any, the employee's performance is deficient. This information can be obtained by conducting a job analysis which pinpoints what an employee needs to know in order to perform a job.

When designing a new training program, or preparing to instruct an employee in an unfamiliar procedure or system, a job analysis can be developed by examining engineering data on new equipment or the safety data sheets on unfamiliar substances. The content of the specific Federal or State OSHA standards applicable to a business can also provide direction in developing training content. Another option is to conduct a Job Hazard Analysis (see OSHA 3071, same title, 1987) (Attachments 9). This is a procedure for studying and recording each step of a job, identifying existing or potential hazards, and determining the best way to perform the job in order to reduce or eliminate the risks. Information obtained from a Job Hazard Analysis (Attachments 9) can be used as the content for the training activity.



If an employee's learning needs can be met by revising an existing training program rather than developing a new one, or if the employee already has some knowledge of the process or system to be used, appropriate training content can be developed through such means as:

- Using company accident and injury records to identify how accidents occur and what can be done to prevent them from recurring.
- Requesting employees to provide, in writing and in their own words, descriptions of their jobs. These should include the tasks performed and the tools, materials and equipment used.
- Observing employees at the worksite as they perform tasks, asking about the work, and recording their answers.
- Examining similar training programs offered by other companies in the same industry, or obtaining suggestions from such organizations as the National Safety Council (which can provide information on Job Hazard Analysis (Attachments 9)), the Bureau of Labor Statistics, OSHA-approved State programs, OSHA full-service Area Offices, OSHA-funded State consultation programs, or the OSHA Office of Training and Education.

The employees themselves can provide valuable information on the training they need. Safety and health hazards can be identified through the employees' responses to such questions as whether anything about their jobs frightens them, if they have had any near-miss incidents, if they feel they are taking risks, or if they believe that their jobs involve hazardous operations or substances.

Once the kind of training that is needed has been determined, it is equally important to determine what kind of training is not needed. Employees should be made aware of all the steps involved in a task or procedure, but training should focus on those steps on which improved performance is needed. This avoids unnecessary training and tailors the training to meet the needs of the employees.

## **IDENTIFYING GOALS AND OBJECTIVES**

Once the employees' training needs have been identified, employers can then prepare objectives for the training. Instructional objectives, if clearly stated, will tell employers what they want their employees to do, to do better, or to stop doing.

Learning objectives do not necessarily have to be written, but in order for the training to be as successful as possible, clear and measurable objectives should be thought-out before the training begins. For an objective to be effective it should identify as precisely as possible what the individuals will do to demonstrate that they have learned, or that the objective has been reached. They should also describe the important conditions under which the individual will demonstrate competence and define what constitutes acceptable performance.

Using specific, action-oriented language, the instructional objectives should describe the preferred practice or skill and its observable behavior. For example, rather than using the statement: "The employee will understand how to use a respirator" as an instructional objective, it would be better to say: "The employee will be able to describe how a respirator works and when it should be used." Objectives are most effective when worded in sufficient detail that other qualified persons can recognize when the desired behavior is exhibited.

## **DEVELOPING LEARNING ACTIVITIES**

Once employers have stated precisely what the objectives for the training program are, then learning activities can be identified and described. Learning activities enable employees to demonstrate that they have acquired the desired skills and knowledge. To ensure that employees transfer the skills or knowledge from the learning activity to the job, the learning situation should simulate the actual job as closely as possible. Thus, employers may want to arrange the objectives and activities in a sequence which corresponds to the order in which the tasks are to be performed on the job, if a specific process is to be learned. For instance, if an employee must learn the beginning processes of using a machine, the sequence might be

- To check that the power source is connected
- To ensure that the safety devices are in place and are operative
- To know when and how to throw the switch, and so on.

A few factors will help to determine the type of learning activity to be incorporated into the training. One aspect is the training resources available to the employer. Can a group training program that uses an outside trainer and film be organized, or should the employer personally train the employees on a one-to-one basis? Another factor is the kind of skills or knowledge to be learned. Is the learning oriented toward physical skills (such as the use of special tools) or toward mental processes and attitudes? Such factors will influence the type of learning activity designed by employers. The training activity can be group-oriented, with lectures, role play, and demonstrations; or designed for the individual as with self-paced instruction.

The determination of methods and materials for the learning activity can be as varied as the employer's imagination and available resources will allow. The employer may want to use charts, diagrams, manuals, slides, films, viewgraphs (overhead transparencies), videotapes, audiotapes, or simply blackboard and chalk, or any combination of these and other instructional aids. Whatever the method of instruction, the learning activities should be developed in such a way that the employees can clearly demonstrate that they have acquired the desired skills or knowledge.

## **CONDUCTING THE TRAINING**

With the completion of the steps outlined above, the employer is ready to begin conducting the training. To the extent possible, the training should be presented so that its organization and meaning are clear to the employees. To do so, employers or supervisors should:

- Provide overviews of the material to be learned
- Relate, wherever possible, the new information or skills to the employees goals, interests, or experience
- Reinforce what the employees learned by summarizing the program objectives and the key points of information covered.

These steps will assist employers in presenting the training in a clear, unambiguous manner.

In addition to organizing the content, employers must also develop the structure and format of the training. The content developed for the program, the nature of the workplace or other training site, and the resources available for training will help employers determine for themselves the frequency of training activities, the length of the sessions, the instructional techniques, and the individual(s) best qualified to present the information.

In order to be motivated to pay attention and learn the material that the employer or supervisor is presenting, employees must be convinced of the importance and relevance of the material. Among the ways of developing motivation are

- Explaining the goals and objectives of instruction
- Relating the training to the interests, skills, and experiences of the employees
- Outlining the main points to be presented during the training session(s)
- Pointing out the benefits of training (e.g., the employee will be better informed, more skilled, and thus more valuable both on the job and on the labor market; or the employee will, if he or she applies the skills and knowledge learned, be able to work at reduced risk).

An effective training program allows employees to participate in the training process and to practice their skills or knowledge. This will help to ensure that they are learning the required knowledge or skills and permit correction if necessary. Employees can become involved in the training process by participating in discussions, asking questions, contributing their knowledge and expertise, learning through hands-on experiences, and through role-playing exercises.

### **EVALUATING PROGRAM EFFECTIVENESS**

To make sure that the training program is accomplishing its goals, an evaluation of the training can be valuable. Training should have, as one of its critical components, a method of measuring the effectiveness of the training. A plan for evaluating the training session(s) should be developed when the course objectives and content are developed. It should not be delayed until the training has been completed. Evaluation will help employers or supervisors determine the amount of learning achieved and whether an employee's performance has improved on the job. Among the methods of evaluating training are:

- Student opinion Questionnaires or informal discussions with employees can help employers determine the relevance and appropriateness of the training program
- Supervisors' observations. Supervisors are in good positions to observe an employee's performance both before and after the training and note improvements or changes
- Workplace improvements. The ultimate success of a training program may be changes throughout the workplace that result in reduced injury or accident rates.

However it is conducted, an evaluation of training can give employers the information necessary to decide whether or not the employees achieved the desired results, and whether the training session should be offered again at some future date.

### **IMPROVING THE PROGRAM**

If, after evaluation, it is clear that the training did not give the employees the level of knowledge and skill that was expected, then it may be necessary to revise the training program or provide periodic retraining. At this point, asking questions of employees and of those who conducted the training may be of some help. Among the questions that could be asked are:

- Were parts of the content already known and, therefore, unnecessary?
- What material was confusing or distracting?
- Was anything missing from the program?
- What did the employees learn, and what did they fail to learn?
- It may be necessary to repeat steps in the training process, that is, to return to the first steps and retrace one's way through the training process. As the program is evaluated, the employer should ask:
- If a job analysis was conducted, was it accurate?
- Was any critical feature of the job overlooked?
- Were the important gaps in knowledge and skill included?
- Was material already known by the employees intentionally omitted?
- Were the instructional objectives presented clearly and concretely?

- Did the objectives state the level of acceptable performance that was expected of employees?
- Did the learning activity simulate the actual job?
- Was the learning activity appropriate for the knowledge and skills required on the job?
- When the training was presented, were the materials and their meanings made clear?
- Were the employees motivated to learn?
- Were the employees allowed to participate actively in the training process?
- Was the employer's evaluation of the program thorough?

A critical examination of the steps in the training process will help employers to determine where course revision is necessary.

## **MATCHING TRAINING TO EMPLOYEES**

While all employees are entitled to know as much as possible about the safety and health hazards to which they are exposed, and employers should attempt to provide all relevant information and instruction to all employees, the resources for such an effort frequently are not, or are not believed to be, available. Thus, employers are often faced with the problem of deciding who is in the greatest need of information and instruction.

One way to differentiate between employees who have priority needs for training and those who do not is to identify employee populations which are at higher levels of risk. The nature of the work will provide an indication that such groups should receive priority for information on occupational safety and health rules.

## **IDENTIFYING EMPLOYEES AT RISK**

One method of identifying employee populations at high levels of occupational risk (and thus in greater need of safety and health training) is to pinpoint hazardous occupations. Even within industries which are hazardous in general, there are some employees who operate at greater risk than others. In other cases the hazardousness of an occupation is influenced by the conditions under which it is performed, such as noise, heat or cold, or safety or health hazards in the surrounding area. In these situations, employees should be trained not only on how to perform their job safely but also on how to operate within a hazardous environment.

A second method of identifying employee populations at high levels of risk is to examine the incidence of accidents and injuries, both within the company and within the industry. If employees in certain occupational categories are experiencing higher accident and injury rates than other employees, training may be one way to reduce that rate. In addition, thorough accident investigation (Attachments 6 & 7) can identify not only specific employees who could benefit from training but also identify company-wide training needs.

Research has identified the following variables as being related to a disproportionate share of injuries and illnesses at the worksite on the part of employees:

- The age of the employee (younger employees have higher Incidence rates).
- The length of time on the job (new employees have higher incidence rates).
- The size of the firm (in general terms, medium-size firms have higher incidence rates than smaller or larger firms).
- The type of work performed (incidence and severity rates vary significantly by Standard Industrial Classification, or SIC, Code), or NAICS Code.
- The use of hazardous substances (by SIC or NAICS Code).
-

These variables should be considered when identifying employee groups for training in occupational safety and health.

In summary, information is readily available to help employers identify which employees should receive safety and health information, education and training, and who should receive it before others. Employers can request assistance in obtaining information by contacting such organizations as OSHA Area Offices, the Bureau of Labor Statistics, OSHA-approved State programs, State onsite consultation programs, the OSHA Office of Training and Education, or local safety councils.

### **TRAINING EMPLOYEES AT RISK**

Determining the content of training for employee populations at higher levels of risk is similar to determining what any employee needs to know, but more emphasis is placed on the requirements of the job and the possibility of injury. One useful tool for determining training content from job requirements is the Job Hazard Analysis (Attachments 9) described earlier. This procedure examines each step of a job, identifies existing or potential hazards, and determines the best way to perform the job in order to reduce or eliminate the hazards. Its key elements are:

- Job description
- Job location
- Key steps preferably in the order in which they are performed
- Tools, machines and materials used
- Actual and potential safety and health hazards associated with these key job steps
- Safe and healthful practices, apparel, and equipment required for each job step.

Safety Data Sheets (SDS) can also provide information for training employees in the safe use of materials. These data sheets, developed by chemical manufacturers and importers, are supplied with manufacturing or construction materials and describe the ingredients of a product, its hazards, protective equipment to be used, safe handling procedures, and emergency first-aid responses. The information contained in these sheets can help employers identify employees in need of training (i.e., workers handling substances described in the sheets) and train employees in safe use of the substances. Material Safety Data Sheets are generally available from suppliers, manufacturers of the substance, large employers who use the substance on a regular basis, or they can be developed by employers or trade associations. MSDS are particularly useful for those employers who are developing training on chemical use as required by OSHA's Hazard Communication Standard.

### **CONCLUSION**

In an attempt to assist employers with their occupational health and safety training activities, OSHA has developed a set of training guidelines in the form of a model. This model is designed to help employers develop instructional programs as part of their total education and training effort. The model addresses the questions of who should be trained, on what topics, and for what purposes. It also helps employers determine how effective the program has been and enables them to identify employees who are in greatest need of education and training. The model is general enough to be used in any area of occupational safety and health training, and allows employers to determine for themselves the content and format of training. Use of this model in training activities is just one of many ways that employers can comply with the OSHA standards that relate to training and enhance the safety and health of their employees.

# TRAINING PROGRAM CHECKLIST

	Complete	Incomplete
1. Established a thorough training program.	_____	_____
2. Identified employees who need training.	_____	_____
3. Training program ensures that new employees are trained before their first assignment.	_____	_____
4. Informed employees of the specific information and training requirements of the Hazard Communication Standard.	_____	_____
5. Informed employees of the requirements of the Standard, and their rights under the law.	_____	_____
6. Informed employees of our written program and training requirements.	_____	_____
7. Informed employees of the different types of chemicals and the hazards associated with them.	_____	_____
8. Informed employees of specific hazards of the chemicals and processes they work with and their proper use and handling.	_____	_____
9. Informed employees of the hazards associated with performing non-routine tasks.	_____	_____
10. Employees know how to detect the presence or release of hazardous chemicals in the workplace.	_____	_____
11. Trained employees in the use of proper work practices, personal protective equipment and clothing, and other controls to reduce or eliminate their exposure to the chemicals in their work areas.	_____	_____
12. Trained employees in emergency and first-aid procedures and signs of exposure.	_____	_____
13. Listed all hazardous chemicals in our workplace.	_____	_____
14. Employees know when and how to update our hazardous chemical list.	_____	_____
15. Obtained or developed a Safety Data Sheet for each hazardous chemical in our workplace.	_____	_____
16. Explained how to use an SDS.	_____	_____
17. Informed employees of the list of hazardous chemicals & SDS's	_____	_____

- and where they are located. \_\_\_\_\_
18. Explained labels and their warnings to employees. \_\_\_\_\_
19. Developed a system to ensure that all incoming hazardous chemicals are checked for proper labels and data sheets. \_\_\_\_\_
20. Established procedures to ensure proper labeling or warning signs for containers that hold hazardous chemicals. \_\_\_\_\_
21. Developed a way to identify and inform employees of new hazardous chemicals before they are introduced into a work area. \_\_\_\_\_
22. Established a way to inform employees of new hazards associated with the chemicals they already use. \_\_\_\_\_
23. Developed a way to evaluate the effectiveness of the training program and to keep track of who has received training. \_\_\_\_\_

## Company Training Program

Training is an integral part of your hazard communication program. Under the Hazard Communication Standard, BCI is required to inform and train employees at the time of their initial assignment to a work area where hazardous chemicals are present and whenever a new hazard is introduced into the work area.

While the outline of topics to be presented in employee information and training programs is the same for all employers, the actual information presented must be based on the specific hazard information conveyed by labels and SDS's for our particular workplace or work area.

These are the topics to be covered in our information and training programs:

- The provisions of the Hazard Communication Standard.
- Any operations in employees' work areas where hazardous chemicals are present.
- The location and availability of the written hazard communication program, including the required list of hazardous chemicals and SDS's required by the Hazard Communication Standard.
- Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area.
- The physical and health hazards of the chemicals in the work area.
- The measures employees can take to protect themselves from these hazards, including information on work practices, emergency procedures and personal protective equipment required by the employer.

The details of the written hazard communication program, including an explanation of the labeling system used by BCI, SDS's, and how employees can obtain and use the appropriate hazard information on the labels and in the SDS's are as follows:

- Identify Employees to be trained:
  - Assess actual and potential employee exposure to hazardous chemicals.
  - Determine training needs based on this exposure during both normal use of hazardous chemicals and during emergencies.
  - Determine appropriate way in which to train new employees and supervisors.
  - Train employees and supervisors on the specific chemicals in our workplace and their hazards.
  - Provisions of the Hazard Communication Standard
  - Show the requirements of the standard.
  - Show BCI's responsibilities under the law.
  - Inform our employees of the law and their rights under the law.
  
- Hazardous Chemicals in Our Workplace
  - Define hazardous chemicals: Any chemical that is a physical or health hazard.
  - "Physical hazard" is one for which there is scientifically valid evidence that the chemical is a combustible liquid, a compressed gas, an explosive, a flammable substance, an organic peroxide, an oxidizer, a pyrophoric, or an unstable (reactive) or water-reactive substance.
  - Health hazard" is one that includes cancer-causing, toxic, or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, and neurotoxins, agents that act on hematopoietic system and agents that damage the lungs, skin, eyes, or mucous membranes
  
- List of Hazardous Chemicals in Our Workplace
  - Show that the list includes the names of the chemicals, their hazards, any protective measures to be taken, and emergency and first-aid procedures.
  - Identify the process or operation where the chemicals are used, and the name and address of the manufacturer.
  - Show there is a material safety data sheet (MSDS) for each chemical and that the list references the corresponding MSDS for each chemical.
  - Make the list readily available to our employees (or to other employers, contractors, or subcontractors at our worksite at their request).
  - Make sure our employees understand the information regarding the chemicals listed in the workplace.
  
- Instruct Employees on How to Use and interpret SDS's
  - Show you have an SDS for each hazardous chemical product you package, handle, or transfer.
  - Show how to check each MSDS you receive to ensure that it contains all the information required by the standard. (See checklist Chapter 4B).
  - Show how to obtain MSDS's or information where necessary
  
- Instruct Employees on Labeling Requirements
  - Show how to check each container entering the workplace for appropriate labeling (i.e., identity of chemicals, hazard warnings; name and address of manufacturer/ importer/ responsible party).
  - Explain the importance of reading labels and of following directions for the safe handling of chemicals.
  - Show how to label, tag, or mark containers into which hazardous chemicals are transferred with the chemical identity and hazard warnings.
  - Show how a hazard warning must convey specific physical and health hazards of the chemicals. Explain that words such as "caution," "danger," "harmful if absorbed by skin," etc. are precautionary statements and do not identify specific hazards.



- Show how to label portable containers when they are not for "immediate use." (Note: Portable containers require no labels when chemicals are transferred into them from labeled containers and when the chemicals will be used immediately by the employee transferring the chemicals.)
  - Show how in lieu of labels: process sheets, batch tickets, standard operating procedures, or other written materials may be used on stationary process equipment if they contain the same information as a label and are readily available to employees in the work area or station.
  - Show how to cross-reference chemical identifiers on labels to MSDS's and the lists of hazardous chemicals.
  - Ensure that our employees are aware of other hazardous chemicals that may have specific labeling requirements under other standards (e.g., asbestos, lead, etc.).
  - Explain the labeling exemptions for portable containers.
- Review & Demonstrate Existing Methods of Controlling Workplace Exposures
    - Review and demonstrate any engineering controls: changes in machinery, work operations, or shop layout that reduce or eliminate the hazard (e.g., ventilation controls process enclosures/hoods, isolation, etc.).
    - Review and demonstrate any administrative controls: good housekeeping procedures, safe work practices, personal and medical monitoring, shortened shifts, or changed work schedules.
    - Show how to use Personal Protective Equipment: safety glasses, goggles, face shields, earplugs, respirators, gloves, hoods, boots, and full body suits.
- Written Emergency Action Plan
    - Train in any applicable procedures such as:
    - Emergency controls and phone numbers;
    - Evacuation plans, alarm systems;
    - Reporting and shut-down procedures;
    - First-aid; and
    - Personal protection.
    - Show how and when to report leaks and spills.
- Record of Employee/ Supervisor Training
    - Follow-up and evaluate your training program to make sure employees know how to handle the chemicals they are using and are applying the training you have given them.

# **HAZARD IDENTIFICATION AND RISK ASSESSMENT PROGRAM**

Hazard identification (HAZID) and risk assessment involves a critical sequence of information gathering and the application of a decision-making process. These assist in discovering what could possibly cause a major accident (hazard identification), how likely it is that a major accident would occur and the potential consequences (risk assessment) and what options there are for preventing and mitigating a major accident (control measures). These activities should also assist in improving operations and productivity and reduce the occurrence of incidents and near misses.

## **HAZARD IDENTIFICATION**

BCI, in consultation with its employees and subcontractors, through JSA's will identify all reasonably foreseeable hazards at the jobsite that may cause a major accident; and the kinds of major accidents that may occur at the jobsite, the likelihood of a major accident occurring and the likely consequences of a major accident.

## **THE IMPORTANCE OF GETTING THE HAZARD IDENTIFICATION RIGHT**

Major accidents by their nature are rare events, which may be beyond the experience of many employers. These accidents tend to be low frequency, high consequence events, however, the circumstances or conditions that could lead to a major accident may already be present, and the risks of such incidents should be proactively identified and managed. Therefore, the hazard identification process should be used for routine and non-routine activities as well as new processes, changes in operation, products or services as applicable.

## **FEATURES OF HAZID**

BCI will expect:

- A clear method statement or description of the HAZID process, defining when it was conducted, how it was planned and prepared, who was involved and what tools and resources were employed;
- That the HAZID process was based on a comprehensive and accurate description of the facility, including all necessary diagrams, process information, existing conditions and modifications; and
- That the overall HAZID process did not rely solely on data that was historical or reactive and that employers ensured that predictive methods were also used.
- The HAZID process must identify hazards that could cause a potential major accident for the full range of operational modes, including normal operations, start-up, shut-down and also potential upset, emergency or abnormal conditions. Employers should also reassess their HAZID whenever a significant change in operations has occurred or a new substance has been introduced.

## **PAST, PRESENT AND FUTURE HAZARDS**

To identify all hazards, the HAZID will need to consider past, present and future conditions, hazards and potential incidents. Past incidents, at the jobsite or similar facilities, provide an indication of what has gone wrong in the past and what could go wrong in the future.

A wide range of hazards and potential incidents will be present in the facility or at the job location. New hazards and incidents could be created in the future as a result of planned or unplanned changes. The management of change process described in the SMS should identify new conditions during the planning of modifications or new activities. This should then trigger further HAZID studies and risk assessments, with the identification of control measures as appropriate.

## **HAZOP**

Hazard and Operability Study (HAZOP) is a highly structured and detailed technique, developed primarily for application to chemical process systems. A HAZOP can generate a comprehensive understanding of the possible 'deviations from design intent' that may occur. However, HAZOP is less suitable for identification of hazards not related to process operations, such as mechanical integrity failures, procedural errors, or external events. HAZOP also tends to identify hazards specific to the section being assessed, while hazards related to the interactions between different sections may not be identified. Therefore, HAZOP may need to be combined with other hazard identification methods, or a modified form of HAZOP used, to overcome these limitations.

## **CHECKLISTS**

There are many established hazard checklists which can be used to guide the identification of hazards. Checklists offer straightforward and effective ways of ensuring that basic types of events are considered. Checklists may not be sufficient on their own, as they may not cover all types of hazards, particularly facility-specific hazards, and could also suppress lateral thinking. Again, this technique should only be used in combination with other techniques for jobsite purposes.

## **JOBSITE HAZARD ANALYSIS (JHA'S)**

This is a technique developed to address human factors, procedural errors and 'man-machine interface' issues. This type of hazard identification is useful for identifying potential problems relating to procedural failures, human resources, human errors, fault recognition, alarm response, etc.

Jobsite Hazard Analysis can be applied to specific jobs such as lifting operations, moving equipment off-line or to specific working environments such as control rooms. Jobsite Hazard Analysis is particularly useful for looking at areas of a facility where there is a low fault-tolerance, or where human error can easily take a plant out of its safe operating envelope.

## **RISK ASSESSMENT**

The aims of risk assessment are to:

- Provide a basis for identifying, evaluating, defining and justifying the selection of control measures for eliminating or reducing risk, and to therefore lay the foundations for demonstrating the adequacy of the standards of safety proposed for the facility;
- Identify hazards that are classified, prioritized and addressed based on the risk associated with the task (Risk analysis matrix outlining severity and probability).
- Provide the employer and employees with sufficient objective knowledge, awareness and understanding of the risks of major accidents at the facility;
- Capture knowledge of risk of a major accident at the facility so it can be managed, disseminated and maintained. The management of knowledge generated in the risk assessment will also greatly assist the efficient development of a safety report for the facility, for example by handling assumptions and actions arising; and
- Provide practical effect to the employer's safety report philosophy. For example, if the employer intends to base the safety report largely on the facility's compliance with specific codes or standards, the risk assessment should address corresponding issues such as the basis of the codes and standards and their applicability to the facility.

## **CONTROL MEASURES**

The previous sections discussed key elements for the range of control measures that should be in place at a jobsite. This section provides more detailed guidance on how to select and judge the effectiveness of specific control measures. Choosing the best control measures and being able to demonstrate their effectiveness is a critical feature of compliance with the Regulations.

## **USING A RISK CONTROL HIERARCHY TO DETERMINE CONTROL MEASURES**

In an occupational health and safety context, risk control is often categorized according to an effectiveness hierarchy; often simply called the “risk control hierarchy”. The hierarchy lists the type of control measures in a priority order based on the extent each measure has an impact on risk. Once control measures are assessed, countermeasures shall be employed to mitigate or reduce the hazards. This shall be determined by Safety Department or Site Supervision. Typically, this is performed by dedicated assignment of task, appropriate documentation of completion of task, and implemented controls.

In the context of jobsites, a useful effectiveness hierarchy of control measures is as follows:

- Eliminate hazards;
- Prevent incidents;
- Reduce consequences; and
- Mitigate the harm.

## **SELECTING AND REJECTING CONTROL MEASURES**

There are several factors to consider when selecting or rejecting control measures. These factors have a bearing on the fundamentally important requirement to:

- Justify the adequacy of control measures (where “adequacy” means “adequate to eliminate risk or reduce it so far as practicable”);
- Identify potential common mode failures; and
- Define performance indicators for the control measures.

The text below sets out a series of core questions that the employer may consider using when selecting or rejecting control measures:

## **INVOLVING EMPLOYEES IN CONTROL MEASURES**

- The Regulations require employers to consult with employees and contractors (where practicable) in all decision-making processes associated with controlling risks.
- The employer should consider defining roles for employees in relation to adopting or reviewing control measures. Through this involvement, employees are able to provide their knowledge of how the facility is operated in practice and assist in identifying the control measures actually in place.
- The employees’ knowledge may also assist in providing an understanding of how control measures function in practice, and how they may fail or be defeated.
- Employees will be aware of issues such as compatibility and maintainability of alternative control measures and are vital to the process of selecting or rejecting control measures. The objective is to make use of employees’ knowledge and experiences in the working of the facility.
- In practice, only particular employees are involved in this way, however, all employees must be provided with information, instruction and training on the adopted control measures.
- In addition, employees will be trained in the hazard identification process, including the use and care of proper PPE, regardless of their involvement in the review and assessment activities.
- This ensures that all individuals understand the control measures to the extent necessary to perform their work safely.
- Evidence of genuine participation by employees in all aspects of selecting control measures will make an important contribution to the quality of the safety report.

## **REVIEWING AND REVISING CONTROL MEASURES**

Control measures must remain valid or effective for the conditions at the jobsite. Ordinarily, it is improbable that all control measures will always remain valid or effective, given changes at the facility and new knowledge about hazards, risks and control measure options.

Reviews of control measures should be triggered whenever a situation arises that would indicate that control measures are no longer valid or effective, for example if there is a proposal to modify the facility, if there has been a major accident or if a control measure fails to meet the set performance standard.

In addition, a periodic review process helps avoid creating new hazards derived from the corrective measures.

## **INVESTIGATING AND ANALYZING CONTROL MEASURES**

Throughout the above steps, the employer will be reflecting upon existing or potential new control measures in the determination of causes, likelihood, consequence and risk. It is essential to be explicit about what control measures are being included and how they are considered to affect risk levels.

# HEARING CONSERVATION PROGRAM

BCI has established a Hearing Conservation Program (Attachment 21) to protect worker from the hazards of noise on the job. OSHA regulations require that each employer implement a hearing conservation program when workers are exposed to noise levels exceeding 85 db. It is not hard to exceed this level of noise on many of the jobs sites. Typically, noise levels exceeding 85 dB are experienced when working with any type of pneumatic chipper or hammer, metal saw, and grinders.

## **RESPONSIBILITY:**

The Safety Department is responsible for the developing a written Hearing Conservation Procedure and overseeing the training of all employees in the company. The Safety Department is also responsible for the monitoring and administering this procedure.

## **INTRODUCTION:**

The OSHA Standard on Occupational Noise Exposure, 29 CFR 1910.95, established the permissible limit of noise as 85 dB(A) (decibels), expressed as an eight-hour (8-hours), time-weighted average, (TWA). This standard allows short-term unprotected noise exposure up to a maximum of 115dB (A), peak sound.

The noise standard requires the identification by personnel monitoring of employees who may be exposed above the 85 db. (A), 8-hour, TWA. Hearing protection is also required for specific activities or using certain types of equipment.

## **PROCEDURES:**

BCI has taken a conservative approach to this noise hazard by establishing this program. The following elements establish the program:

- An Audiometric Testing Program when required
- An Employee Education and Training Program
- Monitoring and Analysis of Workplace Noise Levels
- Providing Suitable Engineering Controls when appropriate
- Providing Hearing Protectors when required
- Maintain required records for the above.

## **AUDIOMETRIC TESTING**

Each new employee whose work exposes them to noise levels above the “OSHA action level” will receive an Audiometric test as part of a pre-screening physical examination to establish a baseline audiogram against which subsequent audiograms can be compared as required by the OSHA Standard.

Annually, all employees who are exposed to noise levels exceeding the 85 dB standard will be given a follow-up Audiometric examination to monitor for any significant changes in their hearing ability.

Employees will be formally notified if there is any change in their hearing as the result of the testing. The Standard has defined this shift as a change in hearing threshold relative to the baseline audiogram of an average of 10 dB or more at 200, 3000 and 4000 Hz in either ear. In determining whether a standard threshold shift has occurred, allowance may be made for the contribution of aging (presbycusis) to the change in hearing level by correcting the annual audiogram according to the procedure described in Appendix F: “Calculation and Application of Age Correction to Audiograms.”

When audiometric testing is required, each affected employee must not be exposed to any workplace noise for at least 14 hours prior to his/her test. This requirement may be met by wearing hearing protectors which will reduce the employee’s exposure to a sound level of 80 db. (A) or below.

Audiometric tests shall be performed by a licensed or certified audiologist, otolaryngologist, or other physician, or by a technician who is certified by the Council of Accreditation in Occupational Hearing Conservation, or who has satisfactorily demonstrated competence in administering audiometric examinations, obtaining valid audiograms, and properly using, maintaining and checking calibration and proper functioning of the audiometers being used. A technician who operates microprocessor audiometer does not need to be certified. A technician who performs audiometric tests must be responsible to an audiologist, otolaryngologist or physician.

An audiologist, otolaryngologist or physician will review problem audiograms and shall determine whether there is a need for further evaluation. The company will provide to the person performing this evaluation the following information:

- A copy of the 29 CFR 1910.95 Hearing Conservation.
- The baseline audiogram and most recent audiogram of the employee to be evaluated.
- Measurement of background sound pressure in the audiometric test room as required in
- 29 CFR 1910.95 Appendix D.
- Records of audiometric calibrations as required by 20 CFR 1910.95 Appendix E.

If a comparison of the annual audiogram to the baseline audiogram indicates a standard threshold shift as defined by OSHA, the employee will be informed of this fact, in writing, by the company within 21 days of determination.

Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the company will ensure that the following steps are taken when a standard threshold shift occurs:

- An employee not using hearing protectors will be fitted with hearing protectors, trained in proper use and care, and required to use them; and
- An employee already using hearing protectors shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.
- Refer the employee for a clinical audiological evaluation or an otological examination, as appropriate, if additional testing is necessary or if the company suspects that a medical pathology of the ear is caused or aggravated by the wearing of hearing protectors.
- Inform the employee of the need for an otological examination if a medical pathology of the ear, which is unrelated to the use of hearing protector, is suspected.

If subsequent audiometric testing of an employee whose exposure to noise is less than an 8-hour TWA average of 90 decibels indicates that a standard threshold shift is not persistent the company:

- Will inform the employee of the new audiometric interpretations: and
- May stop the required use of hearing protectors for that employee.

## **EMPLOYEE EDUCATION AND TRAINING**

Employees of BCI must be trained in the use, care and maintenance of personal hearing protection equipment. The training will cover the following:

- Training will be for all employees who are exposed to noise at or above the 8-hour TWA of 85 db.
- The training will be repeated annually for each employee included in the hearing conservation program.
- The effects of noise on hearing
- The purpose of hearing protectors, the advantages, disadvantages, and the attenuation of various types and instruction on selection, fitting, use and care
- The purpose of audiometric testing, and an explanation of the test procedures.
- Access to information and training materials.

## **MONITORING AND ANALYSIS OF WORKPLACE NOISE LEVELS**

BCI will periodically or as necessary, conduct noise level surveys of the workplace. The results of these surveys will be made available to employees upon request.

Any job area or company location found to be in excess of the allowable designated noise levels that cannot be brought into compliance with the noise standard will be designated as an area where hearing protectors are to be worn. When signs are posted, employees must wear hearing protection. The signs may read as follows:

### **NOTICE EAR PROTECTION REQUIRED IN THIS AREA**

#### **PROVIDE SUITABLE ENGINEERING CONTROLS**

Where appropriate, BCI will provide engineering controls to reduce noise exposure. Due to the complexity of most job sites, it is difficult, if not impossible, to institute effective engineering controls for most noise exposures. Should this be the case, employees will be required to wear suitable hearing protection.

#### **PROVIDE HEARING PROTECTORS WHERE REQUIRED**

BCI will provide and required employees with hearing protectors if his/her 8 hour TWA is above the 85dB (A). BCI will also make hearing protectors available to all employees exposed to a TWA above 85dB (A) at no cost to the employee. Any employee who may have a significant threshold shift of hearing level will be required to wear hearing protection if they are exposed to noise TWA of 85dB. BCI will provide workers with a choice of at least one type of ear plug and one type of ear muff (ear muff cannot be used when anything prevent the seal of the ear muff, such as safety glasses). On some job sites, there will be a choice of two different ear plugs. BCI will make a concerted effort to fine the right protector for each employee, one that offers the right attenuation, is accepted on the terms of comfort, and is used by the employee.

## **RESPONSIBILITIES**

#### **BCI SAFETY DEPARTMENT WILL:**

- Determine all sources of noise at or above 85dD.
- Determine if personnel have 8-hour TWA exposures at or above fifty-percent (50%) of the OSHA allowable.
- Review noise exposures annually for all job classifications with TWA
- Exposure at or above fifty-percent (50%)
- Ensure that audiograms are made annually for personnel whose TWA exposures are at or above fifty-percent (50%) of the OSHA allowable.

#### **JOB SITE SUPERVISION WILL:**

- Will require hearing protection in all area with noise levels at or above the 85dB (A) and for all tasks which generate such noise level (i.e., grinding, hammering).
- Ear plug shall be required in an area and/or on tasks with the sound levels exceeding 105dB.
- Will alert employees to possible hazardous noise exposures, Signs shall be posted in work areas in which the sound levels may exceed 85dB. These signs will be posted by the BCI personnel.
- Evaluate the need for engineering and/or administrative controls to reduce the noise levels below the 85 dB and, where feasible, develop a plan to reduce all personnel exposures to less than fifty-percent (50%) of the OSHA allowable.



- Make hearing protection available and enforce its use by all employees with TWA exposures at or above the fifty-percent (50%) of the OSHA allowable and/or by those who must enter or work in areas where the noise level is 85dB or above.

**\*REMEMBER:** BCI determines if a unit or work area is classified as a high noise area. After the determination is made, BCI employees will be instructed to wear the appropriate hearing protection.

**RECORD KEEPING**

All record-keeping for this program will be maintained in the office. Records will include:

- Audiometric tests
- Noise surveys
- Employee training
- Engineering controls implemented
- Record of purchase of hearing protector

**WORK REQUIRING HEARING PROTECTORS**

There are many jobs or types of work that generally produces noise level that intermittently or for short durations exceed the permissible TWA. It is the policy of BCI to require all workers who are engaged in these jobs to wear hearing protectors.

**HEARING PROTECTORS**

Employees may choose the type of hearing protection that best suits their particular assignment and personal preference for among those listed below. Each employee required to wear hearing protection is responsible for carrying hearing protection on his/her person. Hearing protection is furnished at no cost to employees.

**NOTE: Any and all headphones or in-the-ear audio devices equipment do not meet requirements for hearing protection and shall not be used in that manner.**

EAR PLUGS – Most ear plugs, when worn properly, have a noise reduction rating (NRR) at or about 30. The NRR rating is on the product package.

EAR MUFFS – Adjustable muffs can be worn in three positions:

<u>POSITION</u>	<u>NRR</u>
Over the head	24 (this depends on the NRR of the Ear Muff)
Under the chin	20
Behind the head	20

## COMPUTING THE HEARING PROTECTION LEVEL

To compute the actual hearing protection level under the protector, subtract 7dB (A) from the Noise Reduction Rating (NRR), divide the number by 2, and subtract the remainder from the measured noise level dB (A).

For example:                      NRR of 29 -7 = 22 dB (A)

22 Db. (A) ÷ 2 = 11 dB (A)

Noise level of 95 dB (A) – 11 = 84 dB (A)

Therefore, this device offers a protection level of 11 dB (A).

The following list represents some work activities and equipment which will require the use of hearing protection:

<b>ACTIVITIES AND/OR EQUIPMENT RESULTING IN HIGH NOISE LEVEL</b>	<b>ESTIMATED AVERAGE NOISE LEVEL dB (A)</b>	<b>TYPICALLY</b>
Air Arc Gouging	115	
Air compressor	95	
Chain saw	107	
Electric Disc Grinder	100	
Forklift inside a trailer	98	
Heavy equipment working	100	
Impact tools	108	
Pneumatic chipping hammer	100	
Abrasive blasting	100	
Welding machines	95	

# LOCKOUT/TAG OUT PROGRAM

Work activities associated with energized equipment or processes shall be controlled prior to initiating by verifying a zero energy state.

This policy covers minimum performance standards applicable to all employees and locations. Local practices requiring more detailed or stringent rules, or local, state or other federal requirements regarding this subject can and should be added as an addendum to this procedure as applicable.

## PURPOSE

To establish safe practices associated with equipment or processes that involve hazardous energy sources.

## SCOPE

Applies to all work sites and client job sites that perform activities such as, but not limited to, erecting, installing, constructing, repairing, adjusting, inspecting, cleaning, operating or maintaining equipment/machines/processes whereby hazardous energy sources are involved such as accessing tanks, air handlers, etc.

Note: Special exception to policy: equipment/machines that have an electrical plug as the sole hazardous energy source and can reach a zero energy state by simply being unplugged are exempt from this policy, as long as control of the plug can be maintained at all times.

## DEFINITIONS

**Affected Employee** means any employee who is not an Authorized Employee but is required to work in the area of equipment/machine/processes where Lockout procedures are being implemented.

**Authorized Employee** means any employee who utilizes Lockout procedures on equipment/machines/processes.

**Control Mechanism** means any lock or combination of locks, multi-lock hasps and/or other types of special mechanisms (chains, valve covers, breaker covers, etc.) applied to an energy-isolating device to ensure that it cannot be moved/operated.

**Energy Isolating Device** means a mechanical device that physically prevents the transmission or release of hazardous energy, including, but not limited to the following: a manually operated electrical circuit breaker; a disconnect switch; line valve; slide gate; similar device used to block or isolate energy.

**Hazardous Energy Source** means any type of energy that could injure anyone working on or near the equipment/machine/process if released as a result of work activities. Examples of hazardous energy sources include, but are not limited to the following: electrical; hydraulic (fluid/liquids); pneumatic (air); chemical; radiation; thermal; mechanical (from stored energy, like in flywheels and springs); and mechanical (from gravity).

**Lockout** means the placement of a control mechanism on an energy-isolating device that ensures that the equipment/machine/process being worked on cannot be operated/initiated until the control mechanism is removed.

**Other Personnel** means non company personnel or visitors to any work area where authorized employees are utilizing processes outlined in this Policy.

**Operation Device** means any switch, button, lever, valve, etc. that is expressly intended for the starting or initiation of the equipment/machine/process.

**Zero Energy State** means the equipment/machine/process has been purged of and blocked from hazardous energy sources, that is, no hazardous energy is present.

## **REQUIREMENTS**

### **Identifying Applicable Equipment/Machines/Processes**

The following shall be documented:

- Owned and common/typical equipment/machine/processes where this Policy applies
- Owned and known/common/typical energy isolating devices for applicable procedures related to the identified equipment/machine/processes
- Applicable lockout mechanisms necessary for applicable energy control procedures related to the identified equipment/machine/processes
- Applicable energy control procedures related to the identified equipment/machine/processes.

This information shall be developed by the Safety Department, posted on/near machine and kept on file, utilized within the training required for Authorized employees, and updated as equipment/machines/processes and lockout mechanisms are introduced. A sample format is found in Attachments 22, 23 & 24.

## **TRAINING**

Each affected employee shall receive training during orientation on the procedures of this Policy Section for the expressed purpose of ensuring awareness of the prohibition of removing control mechanisms and/or operation/initiation of applicable equipment/machines/processes.

Each authorized employee shall receive special training in the recognition of hazardous energy sources, the specific and/or common equipment/machines/ processes within respective work areas, types of necessary control mechanisms, and the procedures of this Policy Section.

Both affected and authorized employees shall receive annual re-training.

Any affected or authorized employee shall be immediately re-trained if their actions during related work activities violated any portion of this Policy.

## **LOCKOUT PROCEDURES (IN ORDER OF ACTION)**

### **Preparation**

Authorized employees shall verbally notify affected employees or anyone considered as Other Personnel) of the procedures to be used BEFORE commencing other work activities.

### **Lockout Application**

Perform the actions BEFORE commencing other work activities, in the following order:

- Identify known operation devices for the equipment / machine / process, and commit all of them to the 'off' or 'neutral' position
- Identify known energy controlling devices for the equipment / machine / process, commit all of them to the 'off' or 'neutral' position following established machine shutdown procedures, and utilize a lockout device to secure them in the 'off' or 'neutral' position
  - Note 1: tag the lockout mechanism if multiple authorized employees are present or if the work will not be completed within the normal work shift. In such cases, mark the tag with your name and contact information.
  - Note 2: If the proper lockout procedures or a hazardous energy source is unknown, authorized employees shall not conduct further work activities and shall immediately contact their supervisor for assistance/instructions on proceeding.

- Identify and neutralize all potential stored energy sources such as gravity, springs, electrical capacitors, hydraulic pressure and compressed gases.
- Visually inspect the equipment/machine/process and/or use electronic or mechanical means to verify that a zero energy state has been reached
- Ensure that affected and authorized employees are clear from the equipment/machine/process, and then try to activate the equipment/machine/process by initiating identified operation devices to ensure that a zero energy state has been reached. Apply additional lockouts to any energy controlling devices having unprotected energy sources and repeat this procedure point until a zero energy state is obtained. Proceed with the required work activities for the equipment/machine/process when the zero energy state is obtained

If a zero energy state cannot be reached, contact your supervisor for instructions

### **Release from Lockout**

Authorized employees shall visually inspect the equipment/machine/ process to ensure that personnel and tools have been cleared and/or removed.

Then, only the authorized employee who placed the lockout mechanism into use can remove it. See Attachment 23 for Emergency Lock Removal Procedures.

### **Testing/Diagnosis/Re-positioning Procedures during Lockout**

Perform the actions, in the following order:

- Clear the equipment/machine/process of tools, materials and personnel remove the applicable lockout mechanisms from the energy isolating device.
- Energize the applicable portion of the equipment/machine/process
- Proceed with the test/diagnosis/re-positioning
- De-energize the equipment/machine/process
- Re-apply the applicable lockout mechanisms to the energy isolating device
- Re-test operation devices to ensure a zero energy state is in place
- Continue work and repeat this procedure as necessary

## **EMERGENCY LOCK REMOVAL PROCEDURES**

Attachments 22 &23 shall be utilized for documentation.

Every effort shall be made to personally contact authorized employees prior to their lock being removed.

The direct supervisor of an authorized employee is the first person allowed to remove their lock. If the applicable supervisor is not physically capable, only another authorized employee can be provided with the authority, directly by the applicable supervisor only.

In either event, the direct supervisor of the authorized employee who originally placed the lockout mechanism(s) to be removed shall inform that employee of the removal BEFORE that employee returns to that work area.

This communication shall be documented on Appendix 14-2. Messages (oral, written, or forwarded) are prohibited.

### **Lockout Control Mechanisms**

Each authorized employee shall be issued a lock (for locks) individually keyed and manufactured of a standard size, shape and/or color.

BCI shall require a list of employees and corresponding lock numbers maintained at the work site. Such lists shall be maintained by the Safety Department or Jobsite Superintendent.

## **Multi-lock Hasps**

The following steps shall be followed to accommodate multiple authorized employees on a single project:

- A multi-lock hasp shall be utilized when more than one authorized employee is performing work on the equipment/machine/process.
- The senior authorized employee working on the specific project shall be responsible for assuring that other authorized employees working on the project attach their personal lockout device prior to work being performed.
- The senior authorized employee working on the specific project shall also be responsible for assuring the continuity of the lockout device during shift changes and/or personnel changes unless formally relieved of that responsibility by the Project Manager. At which time, the Project Manager will obtain the responsibility for the integrity of the lockout device.
- When a traditional multi-lock hasp will not provide enough attachment points for authorized employees, another method shall be established (e.g. adding another multi-lock hasp, lockout box, lockout cabinet, etc.) as per the direction of the senior authorized employee working on the specific project.

## **OTHER SPECIALIZED EQUIPMENT**

Tags (when necessary) shall be durable, standardized in type and have areas to indicate the employee's name and contact information. These tags shall be established in Addendum to this Policy.

## **MULTI-CONTRACTOR SITE/SUBCONTRACTOR**

Authorized employees shall inform the supervision of other employers in a multi-employer work site of all aspects covered by policy.

Subcontractors are required to meet or exceed all aspects covered by this policy.

## **POLICY REVIEW AND CERTIFICATION**

Annually, this policy (and applicable addendums and related training programs) shall be reviewed and documented (certified) by the Safety Department for updating and verifying the use of these procedures. Inspections verifying that these procedures are being followed shall be a component of this review.

# PERSONAL PROTECTIVE EQUIPMENT PROGRAM

The purpose of this program is to comply with OSHA and other regulatory compliance standards which require employers to provide employees with and train them in the use of suitable personal protective equipment (PPE) where there is a “reasonable probability” that injury can be prevented by such equipment.

While use of PPE is important, it is only a supplemental form of protection, necessary where all potential hazards have not been controlled through other means such as administrative and engineering controls. For example, administrative and engineering controls are especially important in hearing and respiratory protection (Attachments 35 - 40), which have specific standards that require employers to take all feasible steps to control the hazards.

## **POLICY:**

PPE shall be used in conjunction with administrative and engineering controls to provide for maximum levels of employee safety and health in the workplace. PPE includes all clothing and other work accessories designed to create a barrier against workplace hazards. Employees must be aware that PPE does not eliminate the hazard. If the equipment fails, exposure will occur. To reduce the possibility of failure, equipment must be properly fitted and maintained in a clean and serviceable condition. PPE must not be altered in any manner.

Whenever PPE is required, all personnel shall wear the mandatory minimum PPE. In addition and prior to beginning work, supervisors shall perform a hazard assessment to determine any additional PPE requirements. Based on the findings of this analysis and a review of client/owner permit requirements, PPE shall be provided to and worn by all employees as required to provide maximum levels of protection. PPE requirements may change as the job changes. All required PPE shall be of an approved design and construction for the work to be performed and provided at no cost to the employee. All PPE shall be maintained in a sanitary and reliable condition. All employee-owned PPE shall be treated the same as company-owned PPE and will be approved by your supervisor to be appropriate for the job. Additionally, employee-owned equipment shall be inspected to ensure it meets minimum standards and is in good working condition before use is allowed.

## **TRAINING:**

All employees that are required to wear PPE will receive training on this policy. Documentation of training will include dates of training, employees, number of employees attending the training, and the instructor’s signature. The training will include the following:

- Training that establishes when and where PPE is required and what level is required for the task/job
- Limitations of the PPE
- Training in the use, donning and doffing procedures, including fitting of the equipment for proper use
- Proper care and maintenance of all PPE they are required to use
- Useful life and disposal of PPE
- All employees will receive re-training when the following occurs:
  - Workplace or PPE analysis changes
  - When the employee demonstrates a lack of use or knowledge concerning the PPE required
  - PPE Hazard Assessment

A written program to designate the type of PPE required for the type of work we do is part of the historical data used to formulate this policy. The document is made up of best business practices, industry best practices, our own analysis based on incident data, and regulatory standards. Additionally, client procedures have been reviewed and analyzed for inclusion in the process. All documents are qualified and names and dates of those are included.

## **PROCEDURES:**

### **Minimum PPE:**

All personnel will receive the following initial minimum PPE issue, which is required to be worn at all times when PPE is required:

- Hard-hat meeting OSHA 1910.135 (b) standards.
- Safety glasses meeting OSHA 1910.133 (b) standards.
- Ear plugs, meeting requirements of OSHA 1910.95
- FR outer layer (where required by the client)

Note: Employees are required to furnish and wear sturdy, leather work boots with high tops (minimum 6”) and notched heels. Note: Steel toes may be required for certain assignments, locations, tasks, and by some clients.

PPE shall be inspected by the user prior to each use. Items will be replaced as needed. All exchanges will be on a one-for-one basis. Should employees not have an exchange item, they will be charged for the replacement. Any misuse or neglect that results in unnecessary damage to equipment will be the employee’s responsibility.

All PPE that is determined to be expired, defective, damaged, unsanitary, or un-useable needs to be discarded or returned to the vendor for proper refurbishment or destruction.

### **Head Protection**

A hard-hat must be worn at all times while in the work area except in offices, trailers, unit control room, maintenance shops and fully enclosed cabs of motor vehicles (note: a golf cart, forklift, and other open equipment are not considered fully enclosed vehicles). Hard-hats shall be worn per the manufacturer specifications. Employee shall not modify or alter the suspension or any other components of a hard-hat.

Hard-hats shall meet OSHA 1910.135 (b) standards and should be replaced every 3 to 5 years. Immediately replace any hard-hat that has been involved in a fall or other head impact. Replace any hard-hat that has been dented, cracked or has signs of heat damage. Do not use solvents to clean a hard-hat and do not use paints on a hard-hat.

### **Face and Eye Protection**

To protect the eyes and face against injuries from flying objects, splashing liquids, and harmful rays that cannot always be controlled at the source, safety glasses, goggles, and face shields are provided. Nearly all eye injuries can be prevented by the use of eye protection. Based on past experience, certain jobs and operations have been designated as requiring the use of safety glasses, goggles, and/or face shield.

A complete line of quality eye protection equipment meeting the ANSI requirements is provided for all employees. Every employee is expected to select and wear the proper eye protection, in addition to the minimum requirements, for the job, task and work environment to ensure that eye injury is prevented.

OSHA 1910.133 standards, Safety Glasses with rigid side shields are the minimum level of eye protection to be worn whenever eye/face PPE is required.

Chemical goggles may be required depending on the facility or the task. Whenever this level of eye protection is required (i.e. areas or equipment containing acid/caustic, airborne dust or insulation or other designated areas) the goggles are to be placed over the eyes and positioned so as to provide an effective seal. A face shield with goggles is the minimum eye/face protection required when working in areas where there is a hazardous material splash or release potential.



Double layer eye/face protection (face shield and goggles or safety glasses) is required whenever there is a potential of a projectile injury.

Goggles shall be maintained in a serviceable condition and replaced as needed. When inspecting goggles pay particular attention to the lens and elastic strap condition.

Supervisors shall instruct workers to report all eye irritation, pain and discomfort. These symptoms shall be promptly examined by a qualified medical person and treated as needed. In the event of product exposure, the employee shall have his/her eyes flushed with copious amounts of water for a minimum of 15 minutes.

Instruct workers to have a co-worker assist them and to use care when removing eye/face protection, hard hats and other PPE. Unnecessary eye injuries have occurred when debris was dislodged from the flat surfaces of this equipment while it was being removed. Once this equipment is removed, the worker's hands and face shall be thoroughly washed to remove metal grindings and other material from the forehead, face, eyelashes, eyebrows, eyelids and hands.

During welding operations, employees shall wear welding hoods with No. 10 or darker lens with Z87.1 clear safety glasses. During burning operations, employees shall wear safety glasses with No. 5 or darker lens and a face shield.

### **Body Protection**

Outer layer work clothing (FR clothing), shall be provided to employees. Acid suits, Tyvek coveralls, PVC and neoprene rain suits are available and shall be worn over FRC coveralls when additional protection is needed when working with acids, caustics, coke dust, heavy hydrocarbons or chemicals. These garments are for employee protection and must be worn properly.

### **Nomex or FRC (when required)**

To provide the highest level of protection to employees working in or entering any of the following work areas, employees are required to wear Nomex or FRC coveralls or jackets as outer garments:

Refinery and processing areas including control rooms, tank farms, marine terminals, and shop areas

- Laboratories
- Electrical sub-stations
- Any other areas where a potential exposure to flash fires exists

Exceptions: Jobs that require special protective clothing. When special clothing is needed to protect against things such as acids, caustics, heavy oil, etc., the appropriate PPE may be worn over the Nomex or FRC clothing. During rainy periods, rain gear is permitted. Some clients or tasks may require Fire Resistant rain gear.

They should fit properly and be free of defects, i.e. tears, broken zippers, etc. Soiled or defective coveralls shall be turned in and replaced. The zipper shall be maintained fully zipped up and all buttons, with the exception of the collar button, shall be kept buttoned at all times. Never roll-up the sleeves.

Do not work in clothing that is contaminated with oil or hazardous material. FRC clothing soaked in hydrocarbon will burn. Contamination of FRC coveralls shall be prevented by utilizing other outer protective gear, i.e. rain suits, acid suits, Tyvek, etc. However, in the event of contamination, remove the clothing promptly and obtain clean clothing. Report the incident to your supervisor.

Synthetic outer and under garments must not be worn in the work areas requiring the use of FRC clothing. Synthetic materials, i.e. nylon, rayon, and polyester are highly flammable and can melt quickly during a flash fire. This melting action will increase burn severity. The use of non-synthetic underclothing is strongly recommended. Non-synthetic undergarments such as cotton, silk or wool will provide an additional layer of protection in the event of a flash fire.

## **Rain Suits**

- PVC and Neoprene rain suits are available and should be worn when there is a splashing potential with liquid hydrocarbons.

## **Acid Suits**

- Acid suits are available and shall be worn when full body protection is required to protect employees from exposure to acid splash. Only trained employees shall be permitted to work in this type of hazardous environment.

## **Hand Protection**

- Gloves are necessary and required for work in refineries or construction sites. There often is potential for contact with organic and inorganic chemicals, temperature extremes, and sharp or abrasive surfaces. Most injuries to the hands can be prevented by the proper use of gloves.
- No glove type provides protection from all the potential hand hazards within refineries or construction sites. All employees shall be trained to recognize the potential hazards and how to protect themselves through the proper use of gloves.

## **Work Gloves**

- Work gloves are most frequently needed and should be carried by employees in field work areas.
- Work gloves must be worn anytime work can be done with gloves on and when employees may come into contact with an abrasive or sharp work surface.
- Examples of when work gloves should be worn are when climbing stairs or ladders, lifting or carrying equipment, using any hand tools, riding bikes and when working with sharp tools or objects.
- Exception – While utilizing pipe-threading machines. Serious injuries have resulted when loose fitting gloves have been caught by rotating pipe in these machines.
- Rubber-Type Gloves
  - Rubber-type gloves must be worn when handling any chemicals, i.e., hydrocarbons, solvents, hot oils, etc.
- Vibration Absorbing Gloves
  - Vibration Absorbing Gloves are to be made available to workers using pneumatic impact guns or other vibrating equipment. These gloves are required PPE for workers operating heavy vibrating tools (i.e. jack hammers, 90 guns, impact guns etc.). These gloves are designed to dampen vibration, dissipate impact and absorb shock. They can assist in the prevention of cumulative trauma injury often associated with operating this type of equipment. They only work if you use them.

## **Foot Protection**

- In an effort to eliminate foot injuries and other accidents that result from slipping/tripping, the following minimum standards are established for foot wear types that may be worn by employees working in the field
- Employees are required to furnish and wear sturdy, leather work boots with a notched heel. Boots meeting the requirements for Protective Footwear in 29 CFR 1910.136(b)(1) may be required in certain situations. Work boots must meet the following requirements:
- Upper Boot Construction
  - A substantial weight upper, which extends high enough to be covered by the coverall or pant leg, is required to help protect the feet from injury due to impact, puncture or splash. Traditional leather or leather equivalent man-made material meets this requirement.
- Liquid Resistant Upper
  - Boot with cloth-type inserts and/or suede are not acceptable. Traditional leather or leather equivalent man-made material meets this requirement.

- **Boot Sole Construction**
  - Boots are required to have oil resistant soles. The sole must not be constructed of soft material such as foam rubber.
  - Boots must have defined notched heel to provide adequate protection when climbing ladders.
  - Boots must not have a heel higher than 2 inches and the heel must have a wide base.
- **Rubber Boots**
  - Rubber boots or over-boots are used to protect against chemical splashes and in areas where it is necessary to work in water, deep mud, or bottom sediment.

### **Supplemental PPE**

As determined necessary by task analysis/job hazard analysis, supplemental PPE shall be provided to employees. This may include, but is not limited to:

- Tyvek disposable coveralls
- Face shields
- Rubber boots
- Chemical protective clothing
- Knee pads
- Foot protectors
- Full body harness with dual lanyards (Attachment 19)
- Respiratory Protection (Attachments 35 - 40).

All non-disposable, supplemental equipment shall be returned when no longer needed and is subject to the same replacement policy as Mandatory Minimum PPE.

# PROCESS SAFETY AWARENESS (PSM) MANAGEMENT PROGRAM

## (AWARENESS LEVEL ONLY)

The primary purpose of the PSM Standard is to prevent or minimize the unwanted release of hazardous chemicals, especially into locations that would expose personnel to serious hazards.

### **POLICY:**

It is the company's intent to comply with all applicable regulations and to provide a workforce that is trained to safely perform their jobs with a full knowledge of the hazards and safe work practices associated with refining/chemical plant or other PSM regulated industry work. In accordance with the law, employees will receive initial and refresher training in the following:

An overview of the refinery/chemical plant/facility process and operating procedures for the process that employees will be working with or near, including the hazards of the chemicals used in the process. This will include a complete review of the company HazCom Program and all SDSs that are provided for each unit where the employees will be working;

### **Specific safety and health hazards;**

Procedures and safe work practices applicable to the employee's job tasks, including personal protective equipment, permits (confined space, hot work and general safe permits, job hazard analysis (Attachments 9) and auditing;

Incident investigations are required for all incidents. When an incident occurs, an investigation will be immediately implemented, but not longer than 24 hours after the incident. Causal analysis and corrective actions will be documented and tracked for closure. Those records will be kept for a minimum of 5 years.

### **The site-specific Emergency Action Plan.**

Employees shall comply with established procedures and safe work practices, be on the alert for changing conditions and quickly report any accidental release or potential release of hazardous chemicals to a supervisor.

The company will promptly investigate every incident that results in, or could have resulted in, a dangerous release of a hazardous chemical.

All employees will attend the OWNER's (refinery/chemical plant/facility) process overview and any site-specific training during the refinery/chemical plant/facility orientation, including the process overview and Emergency Action Plan. Attached is a summary of applicable information taken from the PSM standard.

### **Process Safety Management of Acutely Hazardous Materials**

These regulations contain requirements for **preventing or minimizing the consequences of catastrophic releases** of toxic, reactive, flammable or explosive chemicals. These regulations are intended to eliminate to a substantial degree, the risks to which employees are exposed in petroleum refineries and chemical plants.

The employer (refinery/chemical plant/facility) shall develop and implement **written procedures** that provide clear instructions for safely conducting activities involved in each process.

### Steps for Each Operating Phase:

- Start-up
- Normal operation
- Temporary operations
- Emergency operations, including emergency shutdowns
- Normal shutdown
- Start-up following a turnaround, or after an emergency shutdown

### Operating Limits:

- Consequences of deviation
- Steps required to correct and/or avoid deviation
- Safety systems and their functions

### Safety and Health Considerations:

- Properties and hazards of the chemicals used in the process
- Precautions necessary to prevent exposure, including PPE
- Control measures to be taken if physical contact or airborne exposure occurs
- Safety procedures for opening process equipment (such as pipeline breaking)
- Verification of raw materials and control of hazardous chemical inventory levels
- Any special or unique hazards
- 

Note: If Hot Work is to be performed, as with any hot work, a “Hot Work” permit shall be obtained from the client before any work commences (refer to the company hot work/welding policy if applicable).

A copy of the operating procedures shall be readily accessible to employees who work in or near the process area or to any other person who works in or near the process area.

The operating procedures shall be reviewed as often as necessary to assure that they reflect safe operating practices, including changes that result from changes in process chemicals, technology and equipment and changes to facilities.

The employer shall develop and implement **safe work practices** to provide for the control of hazards during operations such as opening process equipment or piping and control over entrance into a facility by maintenance, contractor, laboratory or other support personnel. These safe work practices shall apply to employees and contractor employees.

### **Training:**

**Initial training.** Each employee presently involved in operating or maintaining a process, and each employee before working in a newly assigned process, shall be trained in an overview of the process and in the operating procedures. The training shall include emphasis on the specific safety and health hazards, procedures and safe practices applicable to the employee's job tasks.

**Refresher and supplemental training.** At least every three years, and more often if necessary, refresher and supplemental training shall be provided to each maintenance or operating employee and other workers necessary to ensure safe operation of the facility. The employer in consultation with employees involved in operation or maintenance of a process shall determine the appropriate frequency of refresher training.

**Training certification.** The employer shall ensure that each employee involved in the operation or maintenance of a process has received and successfully completed training. The employer, after the initial or refresher training shall prepare a certification record which contains the identity of the employee, the date of training, and the signatures of the persons administering the training.

**Testing procedures** shall be established by each employer to ensure competency in job skill levels and safe and healthy work practices.

**Contractors:**

The employer shall inform contractors performing work on, or near, a process of the known potential fire, explosion or toxic release hazards related to the contractor's work and the process, and require that contractors have trained their employees to a level adequate to safely perform their jobs. The employer shall also inform contractors of any applicable safety rules of the facility, and assure that the contractors have so informed their employees.

- The employer shall explain to contractors the provisions of the emergency action plan.
- Contractors shall assure that each of their employees have received training to safely perform their job and that the contract employees shall comply with all applicable work practices and safety rules of the facility.
- The Contractor will document that each employee has received and understood the required training. The documentation shall include the name of contract employee, date of training and means used to verify employee understood the training.
- Contractor shall inform the OWNER of any unique hazards presented by the contractor's work, or of any hazards found by the contractor's work.

**Trade Secrets:**

Company employees will respect and maintain the confidentiality of all "Trade Secret" information received and/or gathered from our clients (Owner Facilities). Any and all proprietary information obtained including but not limited to the following is governed by this policy:

- Development of the process hazard analysis
- Development of operating procedures
- Involvement in incident investigations
- Involvement in emergency response or emergency planning
- Involvement in compliance auditing

## **Management of Change (MOC)**

The OWNER (refinery/chemical plant/facility) that is covered by the standard will typically handle all MOC situations, but we need to be aware of the program and be mindful that if we get involved with any changes, the necessary steps will need to take place. The company will establish and implement written procedures to manage changes (except for "replacements in kind") to process chemicals, technology, equipment, and procedures; and, changes to facilities that affect a covered process.

Prior to the change, address the following considerations:

- The technical basis for the proposed change;
- Impact of change on safety and health;
- Modifications to operating procedures;
- Necessary time period for the change; and,
- Authorization requirements for the proposed change.

The Company will train affected employees and contract employees in the change prior to start- up of the process or affected part of the process.

The Company will update Process Safety Information (PSI), Process Hazard Analysis (PHA) and Operating Procedures as applicable.

# SAFETY ASSURANCE PROGRAM

The core purpose of BCI Safety Assurance Program is to provide the framework, guidelines and objectives necessary to facilitate effective review, audit and monitoring procedures that will ensure that our Employee Safety Program is effective at protecting our employees from all occupational illnesses and injuries.

The primary objectives of the BCI Safety Assurance Program are to:

- Determine the ability of our Safety Program to control accident and incident risks
- Determine how efficiently our Safety Program is being implemented; and
- Identify and implement measures to improve safety performance.

In order to meet these objectives, we have developed specific activities, principles and procedures to ensure effective implementation of our Safety Program. Examples of these include:

- General and Site-Specific Safety Policies
- Employee Safety and Health plans that address the regulatory requirements for topics such as but not limited to: Respiratory Protection, Hearing Conservation, Scaffolding Safety, Aerial Lift Safety and Fall Protection.
- Annual review of all written policies and plans to ensure compliance to the most current interpretation of standards.
- Regular physical inspections of job sites and facilities.
- Safety Orientations (Attachments 1&2) for all new employees before they begin work.
- Weekly safety meetings on all job sites and daily Job Hazard Analyses.
- Proper recordkeeping and documentation practices.
- Methods for developing and implementing corrective actions to correct ineffective procedures and substandard inspections.
- Encouraged active participation and communication between all levels of Company personnel.
- Monitoring and review of performance indicators such as OSHA Incident Rate (IR), E-Mod rate, increase in near-miss reports and increase of equipment repair work orders.
- Effective and consistent application of progressive discipline policy to correct unsatisfactory safety behavior.

## ROLES AND RESPONSIBILITIES

In order to accomplish the objectives of the Safety Assurance Program, roles and responsibilities must be applied to all levels of Company personnel. The success of this program is dependent upon each employee accepting the assigned roles and responsibilities and complying with the terms and conditions in order to effectively prevent all incidents and accidents.

**EXECUTIVE MANAGEMENT** is responsible for implementing all safety-related policies and procedures, assigning authority, measuring the use of authority, and providing general support to the line organization to accomplish the objectives of the Safety Assurance Program.



**MANAGERS/SUPERINTENDENTS/SUPERVISORS (Leaders)** of the line organization are authorized and expected to actively strive to prevent accidents in their areas of responsibility by providing leadership, motivation, direction, training, and equipment to accomplish the job safely and efficiently. The following are specific items required:

- Use all reasonable efforts to maintain safe working conditions and practices for the safety of all employees under their supervision.
- Require good housekeeping in their locations.
- Assist in providing safety training to all employees reporting to them with guidance provided by the Safety Department.
- Perform Job Hazard Analyses and fully explain known job hazards and corresponding safety procedures to employees before work begins.
- Require the use of personal protective equipment (PPE) in accordance with BCI safety rules and OSHA regulations.
- Encourage employee safety suggestions and give them timely and due consideration upon submission.
- Conduct weekly job location safety meetings to affect safe practices, work methods, and provide safety training.
- Administer positive discipline for safety law, rule, policy, or procedure violations in accordance with existing BCI company disciplinary guidelines.
- Conduct accident investigations (Attachments 6 & 7) and prepare appropriate reports on all accidents.

**FOREMEN** are authorized and expected to use effective supervisory skills to prevent accidents in their work areas. The following are specific items required:

- Expected to enforce all general and departmental safety rules and work practices.
- Use performance contacts to correct safety performance problems and provide management with proper documentation when a pattern develops. These individuals are required to notify their supervisors or managers when a serious safety violation or problem occurs.
- Report all accidents and see that basic first aid is rendered in the case of injury.
- Assist in the investigation of all accidents, including near-miss incidents, which occur in their work areas and assist in the preparation of the accident reports.

**EMPLOYEES** are expected to actively strive to eliminate unsafe acts and unsafe conditions.

***No job is to be considered completed efficiently unless workers have followed every precaution and safety rule to protect themselves, their fellow employees, and the general public from bodily injury and property damage.***

- Report to their immediate supervisor and seek first aid for all injuries, however minor they may be.
- Report unsafe conditions, equipment, or practices to their immediate supervisor as soon as possible.
- Read and abide by the BCI Safety Manual.
- Expected to use the appropriate personal protective equipment necessary for safe completion of the job.
- Consider working safely and active participation in safety meetings as integral parts of their jobs.
- Encouraged to submit safety suggestions to the Safety Department and management.
- Complete an accident report for all accidents in a prompt manner.

**SAFETY DEPARTMENT** is to serve as the catalyst for the adoption, development, and implementation of an effective Safety Assurance Program and overall safety effort for BCI

- Responsible for maintaining all required OSHA records and logs of accidents for BCI and will provide resources and support to the organization as directed by the Board of Directors of BCI
- Ensure that all Federal, State, local, and BCI safety rules and regulations are complied with.
- Responsible for the continuous and effective promotion of safety awareness within BCI
- Responsible for providing and or obtaining safety training for all levels of the organization.
- Investigate all incidents and accidents, prepare all necessary reports, and submit these reports to the appropriate individuals and entities.
- Submit a review and summary of all accident reports complete with recommendations for future prevention, to the Board of Directors.
- Provide a monthly report to management updating the status of the BCI safety effort.
- Establish and Chair the BCI Safety Committee

## **ACCOUNTABILITIES**

### **Jobsite Supervisors/Managers:**

Definition	The senior craftsman that is on-site and in charge of the installation of the work being performed by BCI project.
Weekly Safety Meeting	On the first work day of the week, the Jobsite Supervisor shall conduct a weekly safety meeting with all on-site employees and any subcontractors they have on the project before work begins. The meeting should not last longer than 15 minutes and the topic discussed shall be pertinent to the actual work being performed for that week. The meeting shall have a sign-in sheet with the date, topic, supervisor's name and names of all attendees. . This documentation shall be attached to the Weekly Safety Report.
Jobsite Hazard Analysis	Conduct a jobsite hazard analysis (JHA) at each site within a project to determine specific hazards at each site. Conduct initial briefing of JHA at each site. Establish format for providing JHA information to each employee assigned to each site. Establish format for providing JHA information to individuals visiting the job sites. The JHA shall be dated, have a listing of all identified hazards, sign-in sheet which includes names of all personnel who have visited the specific job site. This documentation shall be attached to the Weekly Safety Report.

## **SAFETY OFFICER:**

Definition	A designated Company Safety Officer. This does not include on-site safety personnel.
Jobsite Inspections	The Company Safety Department shall visit every project lasting over 4 weeks at least once every quarter and perform a safety inspection using the BCI Site Visit Safety Inspection Checklist.
Employee Safety Training	The Safety Department shall coordinate/conduct specific safety training when required for selected employees. The company's Annual Safety Training schedule shall be utilized to select the training administered to the selected employees as needed.
Report Reviews	The Safety Department shall review all weekly safety meeting reports, JHAs and any other meeting reports which contain BCI safety concerns or interests. These reports will be maintained by the Safety Officer and concerns from these meetings shall be reported in the monthly Executive Safety Report or sooner as needed.
Monthly Safety Reports	The Safety Department shall produce a monthly Safety Report for the BCI Executives. The report will be a review of all weekly safety meeting reports, JHAs and any other meeting reports which contain BCI safety concerns or interests. These reports will be maintained by the Safety Department and concerns from these meetings shall be
Safety Committee	Establish, Organize and Chair BCI Safety Committee. Implement recommendation of the Safety Committee.

## **COMPANY EXECUTIVE OFFICERS:**

Definition	All Company Officers within the company's organization.
Monthly Jobsite Inspections	Each Company Executive Officer, as defined above, shall visit at least one of their projects monthly and perform a Jobsite Inspection utilizing the BCI Safety Checklist
Quarterly Safety Meeting	Each Executive Officer shall visit at least <u>one project each quarter</u> and participate in a safety meeting with all the employees and subcontractors on-site. The meeting should not last longer than 15 minutes and the topic discussed shall be pertinent to the actual work that is being performed. The meeting shall be properly documented with the date, topic, employees' names and Executive Officer's name.
Manager's Monthly Safety Reports	Each Executive Officer shall review the Safety Department's Safety Summary Reports assuring that each activity has been performed, completed, and is accurate. The Company President or Divisional Vice President shall sign off in the designated space.

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# SCAFFOLD SAFETY PROGRAM

## SCAFFOLDING SAFETY PROCEDURES FOR CONSTRUCTION

It is BCIs' purpose in issuing these procedures to further ensure a safe workplace based on the following formal, written procedures for scaffold work. These procedures will be reviewed and updated as needed to comply with new OSHA regulations, new best practices in scaffolding, and as business practices demand. The BCI's Safety Department, is the plan coordinator/manager and is responsible for its implementation. Copies of the written program may be obtained at the Safety Department office.

### APPLICATION

This general scaffold plan applies to:

- All employees who perform work while on a scaffold.
- All employees who are involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds.

### GENERAL PROCEDURES

The following general procedures apply to all scaffold and aerial lift operations for BCI (BCI).

- **Capacity**
  - Taking into account the OSHA rules we must apply and the engineering/manufacturing requirements of our scaffolds, the following rules apply.
  - Each scaffold and scaffold component we use will support, without failure, its own weight and at least four times the maximum intended load applied or transmitted to it.
  - When we use non-adjustable suspension scaffolds, each suspension rope, including connecting hardware, will support, without failure, at least six times the maximum intended load applied or transmitted to that rope.
  - Direct connections to roofs and floors, and counterweights used to balance adjustable suspension scaffolds, shall be capable of resisting at least 4 times the tipping moment imposed by the scaffold operating at the rated load of the hoist, or 1.5 (minimum) times the tipping moment imposed by the scaffold operating at the stall load of the hoist, whichever is greater.
  - Each suspension rope, including connecting hardware, used on non-adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope.
  - Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope with the scaffold operating at either the rated load of the hoist, or 2 (minimum) times the stall load of the hoist, whichever is greater.
  - The stall load of any scaffold hoist shall not exceed 3 times its rated load.
  - Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance with that design.

- **Platform Construction**

- This section documents the procedures and safety requirements we use to construct our scaffold platforms.
  - The following safety rules apply for this scaffold platform construction:
    - Each platform on all working levels of scaffolds shall be fully planked or decked between the front uprights and the guardrail supports as follows:
    - Each platform unit (e.g., scaffold plank, fabricated plank, fabricated deck, or fabricated platform) shall be installed so that the space between adjacent units and the space between the platform and the uprights is no more than 1 inch (2.5 cm) wide, except where the employer can demonstrate that a wider space is necessary (for example, to fit around uprights when side brackets are used to extend the width of the platform).
    - Where the employer makes the demonstration provided for in paragraph (b) (1) (i) of this section, the platform shall be planked or decked as fully as possible and the remaining open space between the platform and the uprights shall not exceed 9 1/2 inches (24.1 cm).
    - The requirement to provide full planking or decking does not apply to platforms used solely as walkways or solely by employees performing scaffold erection or dismantling. In these situations, only the planking that the employer establishes is necessary to provide safe working conditions is required.
    - Each scaffold platform and walkway shall be at least 18 inches (46 cm) wide.
    - Each ladder jack scaffold, top plate bracket scaffold, roof bracket scaffold, and pump jack scaffold shall be at least 12 inches (30 cm) wide. There is no minimum width requirement for boatswains' chairs.
    - Where scaffolds must be used in areas that the employer can demonstrate are so narrow that platforms and walkways cannot be at least 18 inches (46 cm) wide, such platforms and walkways shall be as wide as feasible, and employees on those platforms and walkways shall be protected from fall hazards by the use of guardrails and/or personal fall arrest systems.
    - The front edge of all platforms shall not be more than 14 inches (36 cm) from the face of the work, unless guardrail systems are erected along the front edge and/or personal fall arrest systems are used in accordance with paragraph (g) of this section to protect employees from falling.
    - The maximum distance from the face for outrigger scaffolds shall be 3 inches (8 cm).
    - The maximum distance from the face for plastering and lathing operations shall be 18 inches (46 cm).
    - Each end of a platform, unless cleated or otherwise restrained by hooks or equivalent means, shall extend over the centerline of its support at least 6 inches (15 cm).
    - Each end of a platform 10 feet or less in length shall not extend over its support more than 12 inches (30 cm) unless the platform is designed and installed so that the cantilevered portion of the platform is able to support employees and/or materials without tipping, or has guardrails which block employee access to the cantilevered end.
    - Each platform greater than 10 feet in length shall not extend over its support more than 18 inches (46 cm), unless it is designed and installed so that the cantilevered portion of the platform is able to support employees without tipping, or has guardrails which block employee access to the cantilevered end.
    - On scaffolds where scaffold planks are abutted to create a long platform, each abutted end shall rest on a separate support surface. This provision does not preclude the use of common support members, such as "T" sections, to support abutting planks, or hook on platforms designed to rest on common supports.

- On scaffolds where platforms are overlapped to create a long platform, the overlap shall occur only over supports, and shall not be less than 12 inches (30 cm) unless the platforms are nailed together or otherwise restrained to prevent movement.
  - At all points of a scaffold where the platform changes direction, such as turning a corner, any platform that rests on a bearer at an angle other than a right angle shall be laid first, and platforms which rest at right angles over the same bearer shall be laid second, on top of the first platform.
  - Wood platforms shall not be covered with opaque finishes, except that platform edges may be covered or marked for identification. Platforms may be coated periodically with wood preservatives, fire-retardant finishes, and slip-resistant finishes; however, the coating may not obscure the top or bottom wood surfaces.
  - Scaffold components manufactured by different manufacturers shall not be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained by the user. Scaffold components manufactured by different manufacturers shall not be modified in order to inter-mix them unless a competent person determines the resulting scaffold is structurally sound.
  - Scaffold components made of dissimilar metals shall not be used together unless a competent person has determined that galvanic action will not reduce the strength of any component to a level below that required by paragraph (a)(1) of this section.
- **Supported Scaffolds**
    - Supported scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) shall be restrained from tipping by guying, tying, bracing, or equivalent means, as follows:
    - Guys, ties, and braces shall be installed at locations where horizontal members support both inner and outer legs.
    - Guys, ties, and braces shall be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet (6.1 m) or less thereafter for scaffolds 3 feet (0.91 m) wide or less, and every 26 feet (7.9 m) or less thereafter for scaffolds greater than 3 feet (0.91 m) wide. The top guy, tie or brace of completed scaffolds shall be placed no further than the 4:1 height from the top. Such guys, ties and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (9.1 m) (measured from one end [not both] towards the other).
    - Ties, guys, braces, or outriggers shall be used to prevent the tipping of supported scaffolds in all circumstances where an eccentric load, such as a cantilevered work platform, is applied or is transmitted to the scaffold.
    - Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mud sills or other adequate firm foundation.
    - Footings shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
    - Unstable objects shall not be used to support scaffolds or platform units.
    - Unstable objects shall not be used as working platforms.
    - Front-end loaders and similar pieces of equipment shall not be used to support scaffold platforms unless they have been specifically designed by the manufacturer for such use.
    - Forklifts shall not be used to support scaffold platforms unless the entire platform is attached to the fork and the forklift is not moved horizontally while the platform is occupied.
    - Supported scaffold poles, legs, posts, frames, and uprights shall be plumb and braced to prevent swaying and displacement.

- **Suspension Scaffolds**

- All suspension scaffold support devices, such as outrigger beams, cornice hooks, parapet clamps, and similar devices, shall rest on surfaces capable of supporting at least 4 times the load imposed on them by the scaffold operating at the rated load of the hoist (or at least 1.5 times the load imposed on them by the scaffold at the stall capacity of the hoist, whichever is greater).
- Suspension scaffold outrigger beams, when used, shall be made of structural metal or equivalent strength material, and shall be restrained to prevent movement.
- The inboard ends of suspension scaffold outrigger beams shall be stabilized by bolts or other direct connections to the floor or roof deck, or they shall have their inboard ends stabilized by counterweights, except masons' multi-point adjustable suspension scaffold outrigger beams shall not be stabilized by counterweights.
- Before the scaffold is used, direct connections shall be evaluated by a competent person who shall confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed. In addition, masons' multi-point adjustable suspension scaffold connections shall be designed by an engineer experienced in such scaffold design.
- Counterweights shall be made of non-flowable material. Sand, gravel and similar materials that can be easily dislocated shall not be used as counterweights.
- Only those items specifically designed as counterweights shall be used to counterweight scaffold systems. Construction materials such as, but not limited to, masonry units and rolls of roofing felt, shall not be used as counterweights.
- Counterweights shall be secured by mechanical means to the outrigger beams to prevent accidental displacement.
- Counterweights shall not be removed from an outrigger beam until the scaffold is disassembled.
- Outrigger beams which are not stabilized by bolts or other direct connections to the floor or roof deck shall be secured by tiebacks.
- Tiebacks shall be equivalent in strength to the suspension ropes.
- Outrigger beams shall be placed perpendicular to its bearing support (usually the face of the building or structure). However, where the employer can demonstrate that it is not possible to place an outrigger beam perpendicular to the face of the building or structure because of obstructions that cannot be moved, the outrigger beam may be placed at some other angle, provided opposing angle tiebacks are used.
- Tiebacks shall be secured to a structurally sound anchorage on the building or structure. Sound anchorages include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.
- Tiebacks shall be installed perpendicular to the face of the building or structure, or opposing angle tiebacks shall be installed. Single tiebacks installed at an angle are prohibited.
- Suspension scaffold outrigger beams shall be:
  - Provided with stop bolts or shackles at both ends;
  - Securely fastened together with the flanges turned out when channel iron beams are used in place of I-beams;
  - Installed with all bearing supports perpendicular to the beam center line;
  - Set and maintained with the web in a vertical position; and
- When an outrigger beam is used, the shackle or clevis with which the rope is attached to the outrigger beam shall be placed directly over the centerline of the stirrup.
- Suspension scaffold support devices such as cornice hooks, roof hooks, roof irons, parapet clamps, or similar devices shall be:
  - Made of steel, wrought iron, or materials of equivalent strength;

- Supported by bearing blocks; and
  - Secured against movement by tiebacks installed at right angles to the face of the building or structure, or opposing angle tiebacks shall be installed and secured to a structurally sound point of anchorage on the building or structure. Sound points of anchorage include structural members, but do not include standpipes, vents, other piping systems, or electrical conduit.
- Tiebacks shall be equivalent in strength to the hoisting rope.
- When winding drum hoists are used on a suspension scaffold, they shall contain not less than four wraps of the suspension rope at the lowest point of scaffold travel. When other types of hoists are used, the suspension ropes shall be long enough to allow the scaffold to be lowered to the level below without the rope end passing through the hoist, or the rope end shall be configured or provided with means to prevent the end from passing through the hoist.
- The use of repaired wire rope as suspension rope is prohibited.
- Wire suspension ropes shall not be joined together except through the use of eye splice thimbles connected with shackles or cover plates and bolts.
- The load end of wire suspension ropes shall be equipped with proper size thimbles and secured by eye splicing or equivalent means.
- Ropes shall be inspected for defects by a competent person prior to each work shift and after every occurrence which could affect a rope's integrity. Ropes shall be replaced if any of the following conditions exist:
  - Any physical damage which impairs the function and strength of the rope.
  - Kinks that might impair the tracking or wrapping of rope around the drum(s) or sheave(s).
  - Six randomly distributed broken wires in one rope lay or three broken wires in one strand in one rope lay.
  - Abrasion, corrosion, scrubbing, flattening or peening causing loss of more than one-third of the original diameter of the outside wires.
  - Heat damage caused by a torch or any damage caused by contact with electrical wires.
  - Evidence that the secondary brake has been activated during an over speed condition and has engaged the suspension rope.
  - Swaged attachments or spliced eyes on wire suspension ropes shall not be used unless they are made by the wire rope manufacturer or a qualified person.
- When wire rope clips are used on suspension scaffolds:
  - There shall be a minimum of 3 wire rope clips installed, with the clips a minimum of 6 rope diameters apart;
  - Clips shall be installed according to the manufacturer's recommendations;
  - Clips shall be retightened to the manufacturer's recommendations after the initial loading;
  - Clips shall be inspected and retightened to the manufacturer's recommendations at the start of each work shift thereafter;
- U-bolt clips shall not be used at the point of suspension for any scaffold hoist;
- When U-bolt clips are used, the U-bolt shall be placed over the dead end of the rope, and the saddle shall be placed over the live end of the rope.
- Suspension scaffold power-operated hoists and manual hoists shall be tested by a qualified testing laboratory.
- Gasoline-powered equipment and hoists shall not be used on suspension scaffolds.
- Gears and brakes of power-operated hoists used on suspension scaffolds shall be enclosed.
- In addition to the normal operating brake, suspension scaffold power-operated hoists and manually operated hoists shall have a braking device or locking pawl which engages automatically when a hoist makes either of the following uncontrolled movements: an instantaneous change in momentum or an accelerated over speed.
- Manually operated hoists shall require a positive crank force to descend.



- Two-point and multi-point suspension scaffolds shall be tied or otherwise secured to prevent them from swaying, as determined to be necessary based on an evaluation by a competent person. Window cleaners' anchors shall not be used for this purpose.
  - Devices whose sole function is to provide emergency escape and rescue shall not be used as working platforms. This provision does not preclude the use of systems which are designed to function both as suspension scaffolds and emergency systems.
- **Gaining Access to Scaffolds**
    - Getting to the working platform is critical to the safety of our employees. This section outlines the mechanical requirements for gaining access to scaffold platforms such as: (1) ladders, (2) ramps and walkways, (3) stair rails, and (4) direct access from another scaffold. This section is divided into two parts. The first part is for workers gaining access to scaffold platforms to do work; the second part is access for employees erecting and dismantling scaffolds.
- **Working Employees**
    - When scaffold platforms are more than 2 feet (0.6 m) above or below a point of access, portable ladders, hook-on ladders, attachable ladders, stair towers (scaffold stairways/towers), stairway-type ladders (such as ladder stands), ramps, walkways, integral prefabricated scaffold access, or direct access from another scaffold, structure, personnel hoist, or similar surface shall be used. Cross braces shall not be used as a means of access.
    - Portable, hook-on, and attachable ladders (Additional requirements for the proper construction and use of portable ladders are contained in subpart X of this part -- Stairways and Ladders):
    - Portable, hook-on, and attachable ladders shall be positioned so as not to tip the scaffold;
    - Hook-on and attachable ladders shall be positioned so that their bottom rung is not more than 24 inches (61 cm) above the scaffold supporting level;
    - When hook-on and attachable ladders are used on a supported scaffold more than 35 feet (10.7 m) high, they shall have rest platforms at 35-foot (10.7 m) maximum vertical intervals.
    - Hook-on and attachable ladders shall be specifically designed for use with the type of scaffold used;
    - Hook-on and attachable ladders shall have a minimum rung length of 11 1/2 inches (29 cm); and
    - Hook-on and attachable ladders shall have uniformly spaced rungs with a maximum spacing between rungs of 16 3/4 inches.
  - **Stairway-type ladders shall:**
    - Be positioned such that their bottom step is not more than 24 inches (61 cm) above the scaffold supporting level;
    - Be provided with rest platforms at 12 foot (3.7 m) maximum vertical intervals;
    - Have a minimum step width of 16 inches (41 cm), except that mobile scaffold stairway-type ladders shall have a minimum step width of 11 1/2 inches (30 cm); and
    - Have slip-resistant treads on all steps and landings.
    - Stair towers (scaffold stairway/towers) shall be positioned such that their bottom step is not more than 24 inches (61 cm.) above the scaffold supporting level.
    - A stair rail consisting of a top rail and a mid-rail shall be provided on each side of each scaffold stairway.
    - The top rail of each stair rail system shall also be capable of serving as a handrail, unless a separate handrail is provided.
    - Handrails, and top rails that serve as handrails, shall provide an adequate handhold for employees grasping them to avoid falling.
    - Stair rail systems and handrails shall be surfaced to prevent injury to employees from punctures or lacerations, and to prevent snagging of clothing.

- The ends of stair rail systems and handrails shall be constructed so that they do not constitute a projection hazard.
  - Handrails, and top rails that are used as handrails, shall be at least 3 inches (7.6 cm) from other objects.
  - Stair rails shall be not less than 28 inches (71 cm) nor more than 37 inches (94 cm) from the upper surface of the stair rail to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
  - A landing platform at least 18 inches (45.7 cm) wide by at least 18 inches (45.7 cm) long shall be provided at each level.
  - Each scaffold stairway shall be at least 18 inches (45.7 cm) wide between stair rails.
  - Treads and landings shall have slip-resistant surfaces.
  - Stairways shall be installed between 40 degrees and 60 degrees from the horizontal.
  - Guardrails shall be provided on the open sides and ends of each landing.
  - Riser height shall be uniform, within 1/4 inch, (0.6 cm) for each flight of stairs. Greater variations in riser height are allowed for the top and bottom steps of the entire system, not for each flight of stairs.
  - Tread depth shall be uniform, within 1/4 inch, for each flight of stairs.
- **Ramps and walkways**
    - Ramps and walkways 6 feet (1.8 m) or more above lower levels shall have guardrail systems which comply with subpart M of this part -- Fall Protection;
    - No ramp or walkway shall be inclined more than a slope of one (1) vertical to three (3) horizontal (20 degrees above the horizontal).
    - If the slope of a ramp or a walkway is steeper than one (1) vertical in eight (8) horizontal, the ramp or walkway shall have cleats not more than fourteen (14) inches (35 cm) apart which are securely fastened to the planks to provide footing.
    - Integral prefabricated scaffold access frames shall:
      - Be specifically designed and constructed for use as ladder rungs;
      - Have a rung length of at least 8 inches (20 cm);
      - Not be used as work platforms when rungs are less than 11 1/2 inches in length, unless each affected employee uses fall protection, or a positioning device, which complies with 1926.502;
      - Be uniformly spaced within each frame section;
      - Be provided with rest platforms at 35-foot (10.7 m) maximum vertical intervals on all supported scaffolds more than 35 feet (10.7 m) high; and
      - Have a maximum spacing between rungs of 16 3/4 inches (43 cm). Non-uniform rung spacing caused by joining end frames together is allowed, provided the resulting spacing does not exceed 16 3/4 inches (43 cm).
    - Steps and rungs of ladder and stairway type access shall line up vertically with each other between rest platforms.
    - Direct access to or from another surface shall be used only when the scaffold is not more than 14 inches (36 cm) horizontally and not more than 24 inches (61 cm) vertically from the other surface.

- **Erecting and Dismantling**

- Our company shall provide safe means of access for each employee erecting or dismantling a scaffold where the provision of safe access is feasible and does not create a greater hazard. We shall have a competent person determine whether it is feasible or would pose a greater hazard to provide, and have employees use a safe means of access. This determination shall be based on site conditions and the type of scaffold being erected or dismantled.
- Hook-on or attachable ladders shall be installed as soon as scaffold erection has progressed to a point that permits safe installation and use.
- When erecting or dismantling tubular welded frame scaffolds, (end) frames, with horizontal members that are parallel, level and are not more than 22 inches apart vertically may be used as climbing devices for access, provided they are erected in a manner that creates a usable ladder and provides good hand hold and foot space.
- Cross braces on tubular welded frame scaffolds shall not be used as a means of access or egress.

- **Fall Protection Plan**

- Fall protection planning is critical to the safety and well-being of employees. Our fall protection plan follows the OSHA requirements that are different depending on the type of scaffold we are using. In this plan we address fall protection for our scaffold erectors and dismantlers separately.
- One fact never changes. We know we must provide fall protection for any employee on a scaffold more than 10 feet above a lower level.

- **Working Employees**

- This fall protection plan for our working employees is for the following type(s) of scaffold(s):
  - Single- or two-point adjustable suspension scaffold-We will protect each employee on our single- or two-point adjustable suspension scaffolds by a personal fall arrest system. Our personal fall arrest systems:
    - Meet the requirements of 1926.502(d) (OSHA's Fall Protection rule).
    - Are attached by lanyard to a vertical lifeline, horizontal lifeline, or scaffold structural member.
    - NOTE: Vertical lifelines shall not be used when overhead components, such as overhead protection or additional platform levels, are part of a single-point or two-point adjustable suspension scaffold.
    - When vertical lifelines are used, they shall be fastened to a fixed safe point of anchorage, shall be independent of the scaffold, and shall be protected from sharp edges and abrasion. Safe points of anchorage include structural members of buildings, but do not include standpipes, vents, other piping systems, electrical conduit, outrigger beams, or counterweights.
    - When horizontal lifelines are used, they shall be secured to two or more structural members of the scaffold, or they may be looped around both suspension and independent suspension lines (on scaffolds so equipped) above the hoist and brake attached to the end of the scaffold. Horizontal lifelines shall not be attached only to the suspension ropes.
    - When lanyards are connected to horizontal lifelines or structural members on a single-point or two-point adjustable suspension scaffold, the scaffold shall be equipped with additional independent support lines and automatic locking devices capable of stopping the fall of the scaffold in the event one or both of the suspension ropes fail. The independent support lines shall be equal in number and strength to the suspension ropes.
    - Vertical lifelines, independent support lines, and suspension ropes shall not be attached to each other, nor shall they be attached to or use the same point of anchorage, nor shall they be attached to the same point on the scaffold or personal fall arrest system.]

- Self-contained adjustable scaffold supported by the frame structure-We will protect each employee on our self-contained, frame structure supported, adjustable scaffolds by a guardrail system. The guardrail system:
  - Has a minimum 200-pound top rail capacity.
  - Will be installed before being released for use by our employees.
  - Guardrail systems shall be installed along all open sides and ends of platforms. Guardrail systems shall be installed before the scaffold is released for use by employees other than erection/dismantling crews.
  - The top edge height of top rails or equivalent member on supported scaffolds manufactured or placed in service after January 1, 2000 shall be installed between 38 inches (0.97 m) and 45 inches (1.2 m) above the platform surface. The top edge height on supported scaffolds manufactured and placed in service before January 1, 2000, and on all suspended scaffolds where both a guardrail and a personal fall arrest system are required shall be between 36 inches (0.9 m) and 45 inches (1.2 m).
  - When mid-rails, screens, mesh, intermediate vertical members, solid panels, or equivalent structural members are used, they shall be installed between the top edge of the guardrail system and the scaffold platform.
  - When mid-rails are used, they shall be installed at a height approximately midway between the top edge of the guardrail system and the platform surface.
  - When screens and mesh are used, they shall extend from the top edge of the guardrail system to the scaffold platform, and along the entire opening between the supports.
  - When intermediate members (such as balusters or additional rails) are used, they shall not be more than 19 inches (48 cm) apart.
  - Each top rail or equivalent member of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along its top edge of at least 100 pounds (445 n) for guardrail systems installed on single-point adjustable suspension scaffolds or two-point adjustable suspension scaffolds, and at least 200 pounds (890 n) for guardrail systems installed on all other scaffolds.
  - When the loads specified in paragraph (g) (4) (vii) of this section are applied in a downward direction, the top edge shall not drop below the height above the platform surface that is prescribed in paragraph (g) (4) (ii) of this section.
  - Mid-rails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members of a guardrail system shall be capable of withstanding, without failure, a force applied in any downward or horizontal direction at any point along the mid-rail or other member of at least 75 pounds (333 n) for guardrail systems with a minimum 100 pound top rail capacity, and at least 150 pounds (666 n) for guardrail systems with a minimum 200 pound top rail capacity.
  - Suspension scaffold hoists and non-walk-through stirrups may be used as end guardrails, if the space between the hoist or stirrup and the side guardrail or structure does not allow passage of an employee to the end of the scaffold.
  - Guardrails shall be surfaced to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.
  - The ends of all rails shall not overhang the terminal posts except when such overhang does not constitute a projection hazard to employees.
  - Steel or plastic banding shall not be used as a top rail or mid-rail.
  - Manila or plastic (or other synthetic) rope being used for top rails or mid-rails shall be inspected by a competent person as frequently as necessary to ensure that it continues to meet the strength requirements.

- Cross bracing is acceptable in place of a mid-rail when the crossing point of two braces is between 20 inches (0.5 m) and 30 inches (0.8 m) above the work platform or as a top rail when the crossing point of two braces is between 38 inches (0.97 m) and 48 inches (1.3 m) above the work platform. The end points at each upright shall be no more than 48 inches (1.3 m) apart.]

- **Falling Object Protection**

- All employees must wear hardhats when working on, assembling, or dismantling scaffolds. This is our primary protection from falling objects. Additionally, we will:
  - Install all guardrail systems with openings small enough to prevent passage of potential falling objects.
  - Prevent tools, materials, or equipment that inadvertently fell from our scaffolds from striking employees by barricading the area below the scaffold.
  - In addition to wearing hardhats each employee on a scaffold shall be provided with additional protection from falling hand tools, debris, and other small objects through the installation of toe boards, screens, or guardrail systems, or through the erection of debris nets, catch platforms, or canopy structures that contain or deflect the falling objects.
  - When the falling objects are too large, heavy or massive to be contained or deflected by any of the above-listed measures, the Company will place such potential falling objects away from the edge of the surface from which they could fall and shall secure those materials as necessary to prevent their falling.
  - Where there is a danger of tools, materials, or equipment falling from a scaffold and striking employees below, the following provisions apply:
    - The area below the scaffold to which objects can fall shall be barricaded, and employees shall not be permitted to enter the hazard area; or
    - A toe board shall be erected along the edge of platforms more than 10 feet (3.1 m) above lower levels for a distance sufficient to protect employees below, except on float (ship) scaffolds where an edging of 3/4 x 1 1/2 inch (2 x 4 cm) wood or equivalent may be used in lieu of toe boards;
    - Where tools, materials, or equipment are piled to a height higher than the top edge of the toe board, paneling or screening extending from the toe board or platform to the top of the guardrail shall be erected for a distance sufficient to protect employees below; or
    - A guardrail system shall be installed with openings small enough to prevent passage of potential falling objects; or
    - A canopy structure, debris net, or catch platform strong enough to withstand the impact forces of the potential falling objects shall be erected over the employees below.
    - Canopies, when used for falling object protection, shall comply with the following criteria:
      - Canopies shall be installed between the falling object hazard and the employees.
      - When canopies are used on suspension scaffolds for falling object protection, the scaffold shall be equipped with additional independent support lines equal in number to the number of points supported, and equivalent in strength to the strength of the suspension ropes.
      - Independent support lines and suspension ropes shall not be attached to the same points of anchorage.
    - Where used, toe boards shall be:
      - Capable of withstanding, without failure, a force of at least 50 pounds (222 n) applied in any downward or horizontal direction at any point along the toe board (toe boards built in accordance with Appendix A to this subpart will be deemed to meet this requirement); and

- At least three and one-half inches (9 cm) high from the top edge of the toe board to the level of the walking/working surface. Toe boards shall be securely fastened in place at the outermost edge of the platform and have not more than 1/4 inch (0.7 cm) clearance above the walking/working surface. Toe boards shall be solid or with openings not over one inch (2.5 cm) in the greatest dimension

- **Using Scaffolds**

- Site preparation, scaffold erection, fall protection, and gaining access to the working platform are only some of the requirements for scaffold work. While this all takes concentration and safe work practices, the most dangerous time can be when employees are concentrating on their work and not particularly aware of the hazards of working from scaffolds. It is critical that employees who use scaffolds be trained, among other things, in the recognition of the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. Our competent person will inspect all scaffolds and scaffold components for visible defects before each work shift, and after any occurrence that could affect a scaffold's structural integrity. However, in addition to that, all users of scaffolds in this company will know and understand the following safety rules:
  - Scaffolds and scaffold components will never be loaded in excess of their maximum intended loads or rated capacities.
  - Debris must not be allowed to accumulate on platforms.
  - The use of shore or lean-to scaffolds is prohibited.
  - Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift, and after any occurrence which could affect a scaffold's structural integrity.
  - Any part of a scaffold damaged or weakened such that its strength is less than that required by paragraph (a) of this section shall be immediately tagged out, repaired or replaced, braced to meet those provisions, or removed from service until repaired. An example of tag used in tagging out scaffolding equipment is provided at the back of this program.
  - Scaffolds shall not be moved horizontally while employees are on them, unless they have been designed by a registered professional engineer specifically for such movement or, for mobile scaffolds, where the provisions of §1926.452(w) are followed.
  - The clearance between scaffolds and power lines shall be as follows: Scaffolds shall not be erected, used, dismantled, altered, or moved such that they or any conductive material handled on them might come closer to exposed and energized power lines than (see table in 1926.451(f)(6)). Exception to paragraph (f) (6): Scaffolds and materials may be closer to power lines than specified above where such clearance is necessary for performance of work, and only after the utility company, or electrical system operator, has been notified of the need to work closer and the utility company, or electrical system operator, has deenergized the lines, relocated the lines, or installed protective coverings to prevent accidental contact with the lines.
  - Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.
  - Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials.
  - Where swinging loads are being hoisted onto or near scaffolds such that the loads might contact the scaffold, tag lines or equivalent measures to control the loads shall be used.
  - Suspension ropes supporting adjustable suspension scaffolds shall be of a diameter large enough to provide sufficient surface area for the functioning of brake and hoist mechanisms.
  - Suspension ropes shall be shielded from heat-producing processes. When acids or other corrosive substances are used on a scaffold, the ropes shall be shielded, treated to protect against the corrosive substances, or shall be of a material that will not be damaged by the substance being used.

- Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and those employees are protected by a personal fall arrest system or wind screens. Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.
- Debris shall not be allowed to accumulate on platforms.
- Makeshift devices, such as but not limited to boxes and barrels, shall not be used on top of scaffold platforms to increase the working level height of employees.
- Ladders shall not be used on scaffolds to increase the working level height of employees, except on large area scaffolds where employers have satisfied the following criteria:
  - When the ladder is placed against a structure which is not a part of the scaffold, the scaffold shall be secured against the sideways thrust exerted by the ladder;
    - The platform units shall be secured to the scaffold to prevent their movement;
    - The ladder legs shall be on the same platform or other means shall be provided to stabilize the ladder against unequal platform deflection, and
    - The ladder legs shall be secured to prevent them from slipping or being pushed off the platform.
    - Platforms shall not deflect more than 1/60 of the span when loaded.
    - To reduce the possibility of welding current arcing through the suspension wire rope when performing welding from suspended scaffolds, the following precautions shall be taken, as applicable:
      - An insulated thimble shall be used to attach each suspension wire rope to its hanging support (such as cornice hook or outrigger). Excess suspension wire rope and any additional independent lines from grounding shall be insulated;
      - The suspension wire rope shall be covered with insulating material extending at least 4 feet (1.2 m) above the hoist. If there is a tail line below the hoist, it shall be insulated to prevent contact with the platform. The portion of the tail line that hangs free below the scaffold shall be guided or retained, or both, so that it does not become grounded;
      - Each hoist shall be covered with insulated protective covers;
      - In addition to a work lead attachment required by the welding process, a grounding conductor shall be connected from the scaffold to the structure. The size of this conductor shall be at least the size of the welding process work lead, and this conductor shall not be in series with the welding process or the work piece;
      - If the scaffold grounding lead is disconnected at any time, the welding machine shall be shut off; and
      - An active welding rod or uninsulated welding lead shall not be allowed to contact the scaffold or its suspension system.]
    - We will not intermix scaffold components manufactured by different manufacturers unless the components fit together without force and the scaffold's structural integrity is maintained. Scaffold components manufactured by different manufacturers will not be modified in order to intermix them unless our competent person determines the resulting scaffold is structurally sound.
    - Before a suspension scaffold is used, direct connections must be evaluated by our competent person who will confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed.
    - Prior to each work shift and after every occurrence that could affect a rope's integrity, suspension scaffold ropes will be inspected by our competent person. Ropes will be replaced if any of the conditions outlined in 1926.451(d) (10) exist

## PROHIBITED PRACTICES

The following practices will never be tolerated in this company:

- Scaffold components manufactured by different manufacturers will never be intermixed unless the components fit together without force and the scaffold's structural integrity is maintained.
- Unstable objects will never be used to support scaffolds or platform units. Footings must be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement.
- Cross braces will never be used as a means of access.
- The use of shore or lean-to scaffolds is prohibited.
- Swaged attachments or spliced eyes on wire suspension ropes of suspension scaffolds will not be used unless they are made by the wire rope manufacturer or a qualified person.

## DUTIES OF COMPETENT AND QUALIFIED PERSONS

When working with scaffolds in this company there are some tasks that must be done by our competent or a qualified person. By definition they are:

- *Competent person*-One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- *Qualified person*-One who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

Scaffolds will be erected, moved, dismantled, or altered only under the supervision and direction of a competent person.

Scaffolds must be designed by a qualified person and shall be constructed and loaded in accordance with that design.

We will have each employee who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards.

**NOTE:** Only qualified and competent personnel are allowed to modify scaffolding systems. Non-qualified personnel may create more hazards. If modifications are attempted by non-qualified personnel they will be subject to disciplinary action up to and including termination of employment.

## TRAINING

Recognizing the need for training for employees who:

- Perform work while on scaffolds
- Involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds
- Have lost the requisite proficiency, training is one of the highest priority of this program.



## **Employees Who Use Scaffolds**

Our employees who perform work on scaffolds will be trained by a qualified person to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards. The training will include the following areas as applicable:

- The nature of and the correct procedures for dealing with electrical hazards.
- The nature of and the correct procedures for erecting, maintaining, and disassembling the fall protection and falling object protection systems used.
- The proper use of the scaffold, and the proper handling of materials on the scaffold.
- The maximum intended load and the load-carrying capacities of the scaffolds used.
- Tagging out of scaffolds.
- Any other pertinent requirements of the OSHA rules.

## **Employees Who Erect, Disassemble, Move, Operate, Repair, Maintain, or Inspect Scaffolds**

Our employees who erect, disassemble, move, operate, repair, maintain, or inspect scaffolds will be trained by our competent person to recognize the hazards associated with the work being done. The training will include the following topics as applicable:

- The nature of scaffold hazards.
- The correct procedures for erecting, disassembling, moving, operating, repairing, inspecting, and maintaining the type of scaffold in question.
- The design criteria, maximum intended load-carrying capacity, and intended use of the scaffold.
- Tagging out of scaffolds.
- Any other pertinent requirements of this subpart.

## **Employees Who Need Retraining**

When we have reason to believe that one of our employees lacks the skill or understanding needed for safe work involving the erection, use or dismantling of scaffolds, we will retrain the employee so that the requisite proficiency is regained. Retraining will be done in at least the following situations:

- Where changes at the worksite present a hazard about which the employee has not been previously trained.
- Where changes in the types of scaffolds, fall protection, falling object protection, or other equipment present a hazard about which an employee has not been previously trained.
- Where inadequacies in an affected employee's work involving scaffolds indicate that the employee has not retained the requisite proficiency.

# TRENCHING, SHORING AND EXCAVATIONS PROGRAM

## PRIOR TO STARTING WORK

Excavation work, whether it is pit excavations or trenching, is required to be assessed first by a competent person. The Safety Department has on file, those employees who are qualified and designated as competent persons for excavation. Unlike some other types of works, excavation work relies to a great extent on having almost continuous supervision by a competent person at all stages of progress. Before starting work, a competent person must make a hazard assessment, or Excavation Safety Plan of the area to be worked. This includes the following:

Understand the nature of the area to be worked. Areas to be worked have normal characteristics that require action, and may have unusual characteristics that may require additional precautions when working, such as:

**Underground utilities:** Before any work is performed, a complete location survey of underground utilities shall be performed. Typically, most states have a “one call” system which coordinates all utilities in a given area. This notwithstanding, it’s the competent person’s responsibility to determine that all utilities have either marked or confirmed there are no underground lines present before any excavation work starts.

When utility companies or owners cannot respond to a request to locate underground utility installations within 24 hours, or cannot establish exact location of these installations, BCI’s employees may proceed, provided we do so with caution and provided detection equipment or other acceptable means to locate utility installations are used. Any underground utilities exposed by our work shall be protected from physical damage and hazardous contact with workers.

**Vibration sources:** Heavy traffic, heavy equipment working in close proximity, or other sources need to be assessed for their effect on an excavation. In most cases, heavy vibration will require a shallower slope of excavation walls, or shielding or shoring where they would otherwise not be used (such as less than 5ft. in depth).

**Close proximity of heavy or dynamic loads:** Excavations adjacent to or in streets where there are heavy vehicular traffic such as tractor trailer rigs will usually require substantial shoring to counter the increased transient loads on the excavation edges or walls.

**Hazardous atmospheres:** The area to be worked shall be checked for the likelihood of dangerous gases, or insufficient oxygen levels. These conditions can occur when excavations are made in landfills, or where hazardous substances are or were stored nearby. Any excavations in which hazardous gases or insufficient oxygen levels exist, or are likely to exist shall have gas monitoring performed before any workers are allowed into the excavation. In most cases, areas with these characteristics may be rendered safe either by the configuration of the excavation (sloped walls, shallow pit or trench), or by mechanical ventilation. Excavations in which the competent person determines is configured to present a confined space hazard, and is in an area with hazardous gases or insufficient oxygen levels may have to resort to confined space procedures and controls to perform work in the excavation.

**Worker or pedestrian controls:** The excavation perimeter needs to be assessed for possible accidental egress to the excavation edges. Footpaths, sidewalks, or shortcuts likely to be used, or areas where hedges or other growths may conceal the excavation until it’s too late, may all have to be either barricaded or warning tape placed to prevent unauthorized or accidental egress.

**Worker protection in excavations:** A determination shall be made by the competent person to determine which method of worker protection shall be employed. Any equipment required shall be onsite and used before any workers enter an excavation. The present controls involve sloping excavation walls, trench boxes (shielding) or shoring excavation walls. These controls are itemized later in this section.

**Worker protection outside excavations:** Workers exposed to vehicular traffic shall wear warning vests at all times. Workers exposed to traffic at night shall either have sufficient ambient light to illuminate the workers, or shall have reflective, or illuminated warning vests.

## **STARTING WORK**

The competent person shall be experienced in their field, (in this case excavation work), have knowledge of specific and potential safety hazards that could occur, and have authority from BCI to take immediate corrective action if a safety problem occurs. The competent person's role after excavation starts is to monitor the work's progress for any change in conditions that may affect the worker's safety. At a minimum, daily inspections shall be made to determine if existing worker protection controls are sufficient. If any dangerous conditions exist, the competent person is required to have the workers immediately exit the excavation, and reassess the methods or controls used. Some of the items that a competent person should look for are:

**Water accumulation:** Water accumulation and saturation is a leading cause of trench collapse. Accumulated water weakens the base of the excavation, allowing the upper portions of the trench wall to push into the saturated, muddy level, sliding large sections into the excavation. Water should always be immediately pumped out, and trenches protected from rains, etc. Water that accumulated into an excavation when unattended shall be pumped out, and will likely cause a reassessment of the excavation by the competent person to determine if other or additional worker protection is warranted.

**Worker egress:** Workers are required to have immediate egress from the excavation. Ladders, ramps or other such means shall be placed in and along an excavation to allow the workers to exit the excavation without traveling more than twenty five (25) ft. along the excavation wall.

**Worker/ pedestrian crossing:** Any situations which require workers or pedestrians to cross excavations will be provided with fabricated walkways at least three (3) ft. wide, with handrails on both sides capable of supporting a 200 lb. outward and downward force. The walkways shall be capable of supporting four (4) times the anticipated load.

**Worker overhead protection:** Not all danger to workers is in the excavation. Careful assessment and precautions shall be made by the competent person to prohibit workers working under loads of digging equipment, or other suspended loads. All spoils, materials, and tools shall be kept back at least two (2) ft. from the excavations edge to prevent them from falling rolling, or sliding materials or equipment onto workers in the excavation.

## **EXCAVATION AND SHORING**

All Excavations shall be inspected by a Competent Person who shall have an excavation plan. Inspections shall be made at the initial hazard assessment of the work to be performed, at the start of the excavation, at the beginning of each work shift, and at any time there occurs a hazard-increasing event. Inspections shall examine the possibility of cave-ins, failures or protective systems, etc. If problems are found, personnel shall be immediately removed until the problem is corrected, and the excavation determined safe for entry by the competent person. Excavations less than five (5) feet in depth may require some form of personnel protection, depending on site conditions. The Competent Person shall make this determination, and any excavation determined to be in unstable soil that could collapse shall employ protective measures.

However, all other excavations that are five (5) or more feet in depth must have some form of personnel protection. This protection shall be by the employment of sloping or benching the excavation walls, by shoring the excavation walls, or by means of a trench shield (box) to protect the workers. Excavations in stable rock do not require protection. Care must be taken, however, to classify the soil type when employing sloping, benching or shoring methods.

OSHA has four (4) classifications of soil types that will be followed by BCI that is shown in 29 CFR 1926, Subpart P; however, the following is a guideline of our company policy. The following are the OSHA classifications of soil type with a brief explanation of each type.

**Stable Rock** - the most stable soil type, which may be excavated with vertical walls. However, this rock must be free of defects such as cracks, fissures, seeping water, or other defects. Rock with these defects will usually classify as Type B Soils.

**Type A Soils** - the next most stable soil which is best described as “perfect”. In essence, this soil can no defects such as cracks, fissures, seeping water, vibration sources nearby, and cannot have been previously disturbed. This soil must also be cohesive, with an unconfined compressive strength of at least 3,000psf. In short, this type of soil is rare, and will have to be rigorously tested by visual and manual methods in order to classify any soils type A.

**Type B Soils** - tend to fill in the gap between Types A & C. Typically, Type B Soils are cohesive (although some hard, granular soils may test out as granular Type B) with an unconfined compressive strength between 1,000 and 3,000 psf. Unstable rock (with cracks, fissures, seeping water and other defects), good soils that may be Type A, but having one or more defects, and formerly Type C soils that have been upgraded to Type B after classifying are examples of Type B Soils.

**Type C Soils** - the least stable soil which may be best described as “junk”: there is no worse. Non-cohesive granular soils having an unconfined compressive strength of 1,000 psf or less, sand, gravel, loose backfill, and even submerged soils are all considered Type C Soil. However, OSHA requires that all soils are to be considered Type C with regard to worker protection requirements unless and until a determination is made by a Competent Person that it is another type.

### **Protective Methods**

Therefore the protective methods described below for sloping, benching, and shoring is highly dependent on the soil types you’re working in. Typically, since trench shields (boxes) do not prevent a cave-in per se (they only protect the worker inside the box from being crushed), the type of soil is not relevant. Excavations greater than 20 feet in depth shall be reviewed first by a registered professional engineer. The engineering report should contain detailed data to Safety Department for alternative effective shoring and sloping systems. This data shall include soil evaluations, slope stability, and estimation of forces to be resisted, together with plans and specifications of the materials and methods to be used. When sheet piling is to be used, full loading due to ground water table must be assumed unless prevented by weep holes and drains or other means. Additional stringers, uprights, and bracing must be provided to allow for any necessary temporary removal of individual supports.

**Sloping** - The sides or walls of an excavation may be sloped, if this provides sufficient protection. The degree of sloping is dependent on the type of soil and the depth of excavation, but essentially the firmer the soil, the steeper the slope angle may be. Soil strengths and classifications are shown in 29 CFR 1926, Subpart P, and Appendix B. Specific sloping requirements and values are shown in 29 CFR 1926, Subpart P, and Appendix B.

**Shoring** - The sides or walls of an excavation may be shored, if this provides sufficient protection. Shoring walls may consist of vertical beams placed intermittently or full wall sheathing, depending on soil strength. All materials shall be used shall while in good repair and maintenance; if damaged, they must be inspected. Specific shoring requirements and values are shown in 29 CFR 1926, Subpart P, and Appendix C.

**Trench shield (box)** - Workers may be protected by the use of trench shields, if this provides sufficient protection. Shielding protects the workers if the walls of an excavation collapse up against the box. All materials shall be used while in good repair and maintenance; if damaged, they must be inspected. The nature of shielding therefore requires worker egress over the top of the shielding, and under no circumstances shall any worker exit the shielded area. Workers shall not be in the shield's footprint when installing or removing the shield(s). Shielding shall be of sufficient height and location to prevent the trench walls from collapsing over the top of the shields, and to resist calculated trench forces. Trench wall above the trench box may be sloped back to allow for a minimum required 18 inches of exposure of the trench box. Specific shielding requirements and values are shown in 29 CFR 1926, Subpart P, and Appendix D.

Excavated material, tools, and equipment must be located at least two feet back from the edge of excavations of 5 ft. or greater depth. Excavations 4 ft. or greater in depth shall be tested for hazardous gases if the excavation is in a suspect area (such as proximate to underground fuel storage, landfills, chemical plants etc.).

A ladder (or ramp, or other means) projecting 3 ft. above the upper landing surface to be reached must be provided for emergency exit. Travel distance to the ladder must not exceed 25 ft., therefore, the section of trench where workers are present shall have ladders spaced not more than 50 ft. apart.

**Supervision.** Excavation work must always be under the immediate supervision of a competent person designated by the Safety Department or a qualified person with authority and qualifications to modify the shoring system or work methods as necessary to provide greater safety.

# WELDING, CUTTING AND HOT WORK PROGRAM

This program contains guidelines and requirements for the safe use of flammable and/or compressed gases. It covers the use of flammable-gas piping systems, high- pressure gas cylinders, manifold cylinders, and compressed air. Cutters, welders and their supervisors must be suitably trained in the safe operations of their equipment and the safe use of the process.

## HAZARDS

All gases must be used in a manner that will not endanger personnel or property in routine shop use or experimental operations. Hazards associated with handling and use of flammable and/or high-pressure gases include the following:

- Injuries caused by flying objects accelerated by an explosion or pressure release:
- Asphyxiation;
- Secondary accidents such as falls or electrical shocks:
- Fire caused by ignition of flammable gases:
- Confined spaces: Ventilation is required, prohibiting cylinders in the space, lifelines for permit-required spaces, electrode removal when not in use, and gas cylinder shutoff when not in use and warning signs are required. The Safety Department shall be consulted prior to welding or cutting in any confined space.
- Hazardous Fumes, Gases, Dusts: Any welding, cutting or burning of lead base metals, zinc, cadmium, mercury, beryllium or exotic metals or paints not listed here shall have proper ventilation or respiratory protection.

## RELIEF VALVES REQUIRED

All systems, system components, and piping subject to over-pressures must be equipped with relief devices.

## OPERATIONAL SAFETY PROCEDURES

Equipment containing highly toxic gases requires an Operational Safety Procedure (OSP) and must comply with the requirements described in the chapters on chemical safety. If you are in doubt as to the hazards, toxicity, or safe operating practices for any gases, consult the Safety Department.

## FIRE RISK

Fire requires three elements: fuel, oxygen, and ignition. Any experiment or routine operation that places a flammable gas in the presence of an oxidant (air, oxygen) and an ignition source (spark, flame, high temperature) is extremely dangerous. To reduce the risk of fire, eliminate two of these three elements.

Thus, when using flammable gases, (1) eliminate ignition sources and (2) prevent mixing of fuel with air or oxygen. Contain or vent fuel.

Pyrophoric substances, which are materials that ignite spontaneously when exposed to air, require even more care. Minimize the use of oxygen in high concentration. Materials not normally considered combustible burn violently in high-oxygen atmospheres. Therefore, special precautions must be taken when working with high- oxygen concentrations.

## **HOT WORK PERMITS**

Hot Work Permit Procedure:

A Safety Officer or designated representative, acting as the Fire Safety Supervisor, shall consider if the Hot Work can be avoided. Once it is determined that Hot Work is necessary, the Fire Safety Supervisor should confirm the permit checklist of precautions have been taken. The following elements are identified on the permit:

- The location and nature of the Hot Work.
- Identification of the person who is performing the work.
- Insert an expiration date and time (not beyond one work shift).
- Emergency notification section completed.

After the permit is completed accurately, the Fire Safety Supervisor signs and issues the permit.

The employee hangs the permit in a visible place in the work area.

While the Hot Work proceeds, the fire watch maintains a constant vigil for stray sparks, ignition or other fire hazards, and is ready to provide initial fire response.

Once the work is complete, the fire watch conducts a careful inspection of the work area and adjacent areas for smoldering fires. The inspection includes floors above and below the work area and adjacent rooms. After the inspection is complete and at least 30 minutes have elapsed from completion of hot work, the fire watch then signs the permit and posts permit in a conspicuous location.

Hot Work area should be monitored for an additional three hours. This does not need to involve the fire watch.

When the monitoring period is ended, the Fire Safety Supervisor or a designee conducts a final inspection of the area and signs the permit. The permit is removed and retained in the maintenance office according to the company's record retention policy.

## **DISCIPLINARY ACTION**

Any employee not following this procedure, or deviating from it without approval from management, will be subject to disciplinary action as deemed necessary by management.

## **FIRE WATCH/ FIRE SAFETY**

Before cutting or welding is permitted the area shall be inspected by the Safety Officer or designated representative, responsible for inspection and granting authorized welding and cutting operations.

Assigned fire watchers must be trained in the use of fire extinguishing equipment and familiar with the facilities for sounding an alarm in the event of a fire. If the object to be welded or cut cannot readily be moved, all moveable fire hazards should be removed. If all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks and slag and to protect the immovable fire hazards.

If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat sparks and slag and to protect the immovable fire hazards. If welding cannot be conducted safely the Hot Work Permit will not be granted and welding and cutting shall not be performed.

There are several conditions that require a fire watch:

- Locations where other than a minor fire might develop.
- Combustible materials closer than 35 ft. (10.7M) to point of operation.
- Combustibles that are 35 ft. (10.7M) or more away but are easily ignited.
- Wall or floor openings within 35 feet (10.7M) radius expose combustible materials.
- Combustible materials are adjacent to the opposite side of metal partitions, ceilings or roofs.
- Fire watchers shall have properly inspected and rated fire extinguishers readily available.
- First aid equipment shall be available at all times.

## **TRAINING**

Only personnel, trained and or certified to perform any and all types of welding or cutting operations are authorized to perform welding or cutting activity.

Certification may be obtained through formalized education or years of experience.

Others may be trained by a certified individual to perform singular task unsupervised.

## **GUIDELINES**

All personnel authorized to work with flammable gases must be familiar with the hazards and emergency measures that might be required in the event of an accident. For safe operation the following safety guidelines must be observed:

- A piping (schematic) diagram of the apparatus and an operating procedure that includes safety considerations and emergency instructions must be developed, and the installed piping must be inspected to ensure that it is installed as shown on the piping diagram.
- Only personnel authorized to work on the experiment are allowed in the operations area.
- Appropriate warning devices and signs, such as "Danger-Acetylene" and "No Smoking and Open Flames," must be posted on or near the work area and at the doors to the operating area.
- Flammable gas shutoff valves must be located outside flammable gas operating areas.
- Good housekeeping practices must be observed; unnecessary combustible material must be kept out of flammable gas operating areas.
- Only the flammable gas cylinders actually required for the experiment are allowed in the operating area. Extra cylinders must be stored in an approved area outside the building or work area.
- When two or more cylinders containing flammable gas are used inside a room or other confined area, and are connected to a common manifold, the regulators must be modified. The existing relief valves on the regulator must be replaced with two special relief valves connected to a metal vent line that terminates outside and above the building.
- Likewise, when the building occupancy is rated H7, as defined in the Uniform Building Code, all flammable gas regulators must have their relief valves vented to a vent line that terminates outside and above the building.
- All ignition sources, e.g., welding torches, lit cigarettes, electric arcs, electrostatic charges, and pilot lights, must be kept away from flammable gases at all times.
- Ventilation must be provided to prevent entrapment of flammable gases in closed areas. If the gas is lighter than air, overhead ventilation is required. Gases denser than air must be prevented from entering trenches and manholes where they can collect and form explosive mixtures with air.



- Cracking an acetylene gas cylinder valve before attaching the regulator is not recommended since the gas may be ignited by static charge or friction heating. Closing the valve stops the flame immediately.
- Never use a flame to detect flammable gas leaks. Use soapy water or use other approved methods.
- If a flammable gas cylinder is discovered with a small leak and the gas has not ignited, the cylinder must be moved carefully to a safe outside area. If the leak is serious or the gas has ignited, evacuate the area and contact the BCI Safety Department and the local Fire Department immediately.

## **OXYGEN**

Oxygen supports combustion but is itself nonflammable. Oxygen lowers the ignition point (in air) of flammable substances and causes them to burn more vigorously. Materials such as oil and grease, even in minute quantities, can burn with nearly explosive violence in oxygen. Therefore, oxygen cylinders must not be handled with greasy or oily hands or gloves and must not be stored near highly combustible materials such as oil, grease, or reserve acetylene.

Oxygen must never be used to purge lines, to operate pneumatic tools, or to dust clothing - cloth, plastics, etc., saturated with oxygen burn explosively. Accordingly, oxygen cylinders must never be used as hat racks, clothes hangers, etc., since leaky fittings can result in accumulations of gas in the covering material.

Insects in oxygen "pigtails" can ignite spontaneously and may cause sufficient heat and over-pressure to burst the pigtail, valve, or manifold. Do not leave pigtails disconnected for more than a few minutes.

Do not use white lead, oil, grease, or any other non-approved joint compound for sealing oxygen-system fittings. Threaded connections in oxygen piping must be sealed with joint compounds or Teflon tape approved for oxygen service. Litharge and water is recommended for service pressures above 300 psig (2.0 MPa). Gaskets must be made of non-combustible materials.

When high pressure oxygen cylinders are stored inside a building, they must be separated from flammable gas cylinders by at least 20 feet or by a fire-resistive partition.

## **ACETYLENE**

Acetylene is used principally with welding and cutting torches. Commercial acetylene gas is colorless and highly flammable with a distinctive garlic-like odor. Acetylene, in its free state under pressure, may decompose violently - the higher the pressure, the smaller the initial force required to cause an explosion. Therefore, acetylene is stored in acetone, which dissolves 300 times its volume of acetylene. Acetylene cylinders are filled with a porous filler material that holds the acetone. The combination of filler and acetone allows acetylene to be contained in cylinders at moderate pressures without danger of explosive decomposition. Full cylinder pressure is 250 psig at 70 degrees F.

*CAUTION:* when acetylene is withdrawn from its cylinder too rapidly, the gas cannot come out of solution fast enough, the downstream pressure drops, and liquid acetone is thrown out of the cylinder and may limit the flow of the pressure-reducing regulator.

The following precautions are recommended when working with acetylene:

- To prevent flashbacks check valves are required in welding gas lines and at the welding/cutting torch. If the acetylene pressure drops, the oxygen pressure at the torch can push oxygen back up the acetylene line, where it can mix with acetylene and cause a flashback.
- Copper must not be used in acetylene piping - copper forms an impact-sensitive copper acetylene.
- NEVER use free acetylene gas outside the cylinder at pressures over 15 psig (30 psia) -- it can decompose violently.
- Acetylene cylinders should be used or stored only in an upright position to avoid the possibility of acetone leaking from the cylinder. If an acetylene cylinder has been stored horizontally, the cylinder should be placed upright and left in that position for about 30 minutes before being used.

- When cylinders are empty of acetylene, valves must be closed to prevent evaporation of the acetone.
- Acetylene cylinders may be filled only by the supplier.

## **MAGIC GAS**

Magic Gas (magic gas II). This particular mixture is denser than air and consists of the following:

- Isobutene \_\_\_\_\_ 23.52%
- Methyl (dimethyl-methane) \_\_\_\_\_ 4.00% (nominal) Freon 13-B1 \_\_ 0.48%
- Argon \_ 72.00%

This gas is purchased premixed in Matheson 1F (Fat Boy) cylinders pressurized to 35 psig. The flammable limits of this gas are about 1.8% to 7% in air.

BCI safety rules for high pressure cylinders and flammable gases apply to all uses of Magic Gas.

## **CYLINDERS**

Only cylinders meeting Department of Transportation (DOT) regulations may be used for transporting compressed gases. Each cylinder must bear the required DOT label for the compressed gas contained, except under certain specified conditions set forth in DOT regulations.

It is illegal to remove or to change the prescribed numbers or other markings on cylinders - do not deface, cover, or remove any markings, labels, decals, or tags applied or attached to the cylinder by the supplier. Each cylinder that is in use at BCI must carry a legible label or stencil identifying the contents. Do not repaint cylinders unless authorized by the owner.

Compressed-gas containers must not contain gases capable of combining chemically, nor should the gas service be changed without approval by Safety Department.

The cylinder-valve outlet connections on cylinders containing gas mixtures are provided by the gas supplier, based on the physical and chemical characteristics of the gases.

Gas mixtures having a flammable component must have a cylinder-valve outlet connection with left-handed threads, even though the gas mixture is nonflammable, unless the Safety Department has authorized otherwise.

Regulators, gauges, hoses, and other appliances provided for use with a particular gas or group of gases must not be used on cylinders containing gases having different chemical properties unless information obtained from the supplier indicates that this is safe.

Gases must not be mixed at BCI sites in commercial DOT cylinders and must not be transferred from one DOT cylinder to another. Gases that are mixed at BCI must never be put into a BCI - or vendor-owned compressed gas cylinder.

Vendor-owned cylinders must not be used for any purpose other than as a source of vendor-supplied gas. Only the vendor may pressurize these cylinders.

It is illegal to transport a leaking cylinder (charged or partially charged) by common or contract carrier.

## **CYLINDER HANDLING**

- Compressed gases should be handled only by experienced and properly instructed personnel. When in doubt about the proper handling of a compressed gas cylinder or its contents, consult the Responsible Safety Officer.
- Compressed gas cylinders are dangerous when handled incorrectly. Always assume that a cylinder is pressurized. Handle it carefully. Never throw, bang, tilt, drag, slide, roll, or drop a cylinder from a truck bed or other raised surface. If a cylinder must be lifted manually, at least two people must do the lifting. Because of their shape, smooth surface, and weight, gas cylinders are difficult to move by hand. A truck or an approved cylinder handcart must always be used to move a cylinder. Cylinders must be fastened in metal cradles or skid boxes before they are raised with cranes, forklifts, or hoists. Rope or chain lifting slings (Attachments 31, 32, 33 & 34) alone must not be used. Cylinders, even empty ones, must never be used as rollers for moving materials, as work supports, etc.
- If damaged, a cylinder can cause severe injuries, including lung damage from inhalation of toxic contents and physical trauma from explosion. A pressurized gas cylinder can become a dangerous projectile if its valve is broken off.
- Workers in charge of oxygen or fuel-gas supply equipment (including distribution piping systems and generators) must be instructed and judged competent for such work.
- When a cylinder is not connected to a pressure regulator or a manifold, or is otherwise not in use, it is extremely important that the cylinder valve be kept closed and the safety cap be kept in place -- the cap protects the cylinder valve (do not lift cylinders by their caps). Notify the Safety Department, giving details and cylinder serial number, if you believe that a foreign substance may have entered the cylinder or valve.
- Cylinders containing compressed gases should not be subjected to a temperature above 125 degrees F. Flames, sparks, molten metal, or slag must never come in contact with any part of a compressed gas cylinder, pressure apparatus, hoses, etc. Do not place cylinders where they might become part of an electric circuit. When cylinders are used in conjunction with electric welding, ensure that the cylinders cannot be accidentally grounded and burned by the electric welding arc.
- Cylinders must not be subjected to artificially low temperatures. Many ferrous metals become extremely brittle at low temperatures. The loss of ductility and thermal stress at low temperature may cause a steel cylinder to rupture.
- Never attempt to repair, alter, or tamper with cylinders, valves, or safety relief devices.

## **WORKING WITH GASES**

- Always identify the contents of a gas cylinder before using it. If a cylinder is not clearly labeled, do not use it. Place a "Danger – Do Use Tag" on the valve and store accordingly. Contact the supplier to come and get the cylinder and replace with properly identified cylinder.
- Before using a cylinder, be sure it is properly supported with two metal chains or the equivalent to prevent it from falling. Contamination of compressed gas cylinders by feedback of process materials must always be prevented by installation of suitable traps or check valves.
- Suitable pressure-regulating devices and relief devices must always be used when gas is admitted to systems having pressure limitations lower than the cylinder pressure.
- Gas cylinder valves can be "cracked" (opened slightly) momentarily before regulators are attached to blow dirt off the valve seats, but the valve outlet should always be pointed away from people or equipment. (Cracking the valve is not recommended with Acetylene because it can be ignited by static charge or friction.) After the regulator is securely attached to the cylinder valve, fully release (turn counter-clockwise) the pressure-adjusting screw of the regulator before opening the cylinder valve. Open gas cylinder high pressure valves slowly; this gives compression heat time to dissipate and prevents "bumping" the gauges. Never use a wrench on any cylinder-valve hand wheel.
- Keep removable keys or handles on valve spindles or stems while cylinders are in service.

- Never leave pressure in a system that is not being used. To shut down a system, close the cylinder valve and vent the pressure from the entire system. Equipment must not be disassembled while it is under pressure. Be aware that any valved-off portion of the system may still be under pressure; bleed the hose, line, or vessel before disassembly to ensure that there is not enough pressure energy stored in the trapped gas or in piping distortion to propel loose objects.
- Connections to piping, regulators and other appliances should always be kept tight to prevent leakage. Where hose is used, it should be kept in good condition.
- Manifold pigtails should not be left disconnected for more than a few minutes. Certain insects are attracted to pure gases and will quickly clog these lines.
- Never use compressed gas to dust off clothing; this may cause serious injury or create a fire hazard.
- About 30 psi gauge pressure (0.2 MPa) must be left in "empty" cylinders to prevent air from entering the cylinder and contaminating it; air contamination in an acetylene cylinder is extremely dangerous.
- Before a regulator is removed from a cylinder, close the cylinder valve and release all pressure from the regulator.
- Before returning an empty cylinder, close the valve and replace the cylinder-valve protective cap and outlet cap or plug, if used.

## **CYLINDER STORAGE**

- When transporting, moving or storing compressed gas cylinders and oxygen cylinders, they shall be stored in an upright secured position 20 feet from any flammable gases or petroleum products. Oxygen cylinders shall be stored in an upright secured position 20 feet from any flammable gases or petroleum products.
- Cylinders not actively in use inside of buildings must be stored outside in areas approved by the Safety Department and must be fastened - with two metal chains or bars or in a fixture - to prevent them from falling if they are bumped or shaken, as during an earthquake.
- When gases of different types are stored at the same location, cylinders must be grouped by types of gas, and the groups must be arranged in accordance with the gases contained, e.g., flammable gases must not be stored near oxygen.
- Charged cylinders and empty cylinders should be stored separately in a configuration that allows removal of "old stock" (cylinders in storage the longest) with minimum handling of other cylinders.
- Storage rooms or areas should be dry, cool, well ventilated, and, where practical, fire resistant; must have solid, level floors or storage surfaces; and must be away from traffic. Storage in sub-surface locations should be avoided. Cylinders must not be stored at temperatures above 125 degrees F or near radiators or other sources of heat, near sparking devices, or near salt or other corrosive chemicals. If stored outside, cylinders must be protected from continuous direct sunlight, extreme weather, or moisture.

## **COMPRESSED AIR**

- Compressed air for general shop or laboratory use must be restricted to 30-psig (207-kPa) maximum pressure by restricting nozzles. Compressed air at pressures up to 100-psig (700-kPa) may be used to operate pneumatic tools, certain control instruments, and research equipment with properly designed over-pressure relief devices. Use of air-pressurized research equipment must be approved by the Responsible Safety Officer.
- Building compressed air (house air) may be used to dry parts and to help accomplish many other jobs in the shop or laboratory, but always ensure that no one is in line with the air stream and always wear goggles or a face shield.
- Compressed air must not be used for breathing unless it has been especially installed for this purpose and such use has been approved by Responsible Safety Officer.
- Never apply air pressure to the body or use compressed air to clean clothing. Compressed air injected into the body openings can be fatal. Compressed air used to clean clothing drives particles into the fabric, where they can cause skin irritation and infections. Use a clothes brush.

- Compressed air must not be used to transfer liquids from containers of unknown safe working pressure. A pressurized commercial drum of unknown pressure rating is a hazardous device; for example, a 55-gal (200liter) drum pressurized to 14.5 psig (100 kPa) has a force on the drum head of about 3 tons. To transfer liquids use a pump or a siphon with a bulk aspirator. The transfer pressure for commercial-type liquid nitrogen dewars must be less than 14.5 psig. For most laboratory-type liquid nitrogen systems, transfer pressures of less than 5 psig are adequate. Compressed air must never be used for transferring liquid hydrogen or liquid helium.
- When an automatic shut-off coupling is not used on air-operated tools, a short metal chain (or its equivalent) should be attached to the hose to prevent it from whipping in case it separates from the tool. When using an air-operated tool, shut off the compressed air and vent the hose before changing nozzles or fittings.

## WELDING & CUTTING

- Protecting yourself when performing welding operations depends on your understanding of the hazards involved and the proper way to control them. Controlling of welding hazards include avoiding eye injury, respiratory protection, ventilation of the work area, protective clothing and having safe equipment to use.
- Workman assigned to operate arc welding equipment must be properly instructed and qualified to operate such equipment. Workmen assigned to operate or maintain equipment be familiar with section (1910.254) and with 1910.252(a) (b) & (c).
- Operators of equipment shall report any equipment defect or safety hazards and discontinue use of equipment until its safety has been assured and repairs shall be made only by qualified personnel.
- Eye hazards include exposure to ultraviolet and infrared light. Welders and their helpers should wear filter glasses with shades ranging from 2 to 14, depending on the type of welding being done, to protect their eyes. Unless a welding arc is behind a screen, not only the welder, but also people nearby may need eye protection. Other workers should be excluded within a 30 foot radius from gas or low powered arc welding, or also be protected with appropriate filter lenses. Heavy welding requires a 100 foot radius. Inert gas welding produces 5 to 30 times as much ultraviolet light as arc welding and requires shielding for even greater distances. Keep in mind that ordinary untreated plastic lenses absorb ultraviolet light very poorly and should not be relied on for protection.
- Virtually all welding processes generate gases, fume and dusts. Gases generated include carbon monoxide, carbon dioxide, ozone, and nitrous gases. Other gases may also be formed in the presence of chemicals which may be on the material being welded. For example 1, 1, 1 Trichloroethane generates phosgene gas when exposed to the heat of welding. Welding and cutting can also generate fumes from cadmium, lead, cyanide, beryllium, arsenic, fluorides, nickel, cyanide, and other materials when can be hazardous if inhaled. Proper respiratory protection should always be worn when cutting or welding. The best type of protection to use can be determined by reading the Safety Data Sheet for the material being welded, or the manufacturer of the rod or flux being used.
- Mechanical ventilation at the rate of 2,000 cubic feet per minute per welder is required if the area is more crowded than 10,000 cubic feet per welder; has a ceiling height of less than 16 feet; or in confined spaces where structural barriers significantly obstruct cross ventilation. Additional specific ventilation requirements are necessary for fluorine compounds, zinc, lead, beryllium, cadmium, mercury, and for stainless steel that is oxygen cut using either a chemical flux or iron powder or gas shielded arc cutting. Where it is not possible to provide this ventilation, airline respirators, hose masks, or self-contained units must be used. Oxygen should never be used for ventilation.
- All parts of the body should be protected from radiant energy, sparks, and molten metal splashes. Clothing made from wool, or wool blends, is generally better than cotton. Some cutting operations such as inert-gas metal arc welding will cause exposed cotton clothing to rapidly deteriorate. Leather capes, jackets, leggings, and aprons provide additional protection especially in vertical or overhead operations. Use of dark clothing will help reduce reflected light.
- All welding equipment should be inspected each day prior to use. Report any defects found in regulators, torches or electrical components to a person that is qualified to make the necessary repairs.

## VENTILATION

The fumes produced in a welding operation can be hazardous to the welder or workers in the near vicinity. Reducing the exposure to fumes through an effective local exhaust or area ventilation system is the first line of defense in preventing discomfort or illnesses from toxic welding fumes.

Respirators are another means of reducing exposure. This personal protective equipment should be considered a temporary process until more appropriate measures to control the exposure are in place. However, when the level of the exposure cannot be entirely eliminated by an exhaust ventilation system, some form of respiratory protection will be required when welding is performed. Highly toxic or concentrated welding fumes may require the welder to use a supplied air hood-type respirator, no matter what type of ventilation is in place.

Testing equipment is needed to effectively evaluate the levels of toxicity welding fumes emit. Many toxic fumes are colorless and odorless, and chronic effects of overexposures may not be immediately detectable. Harmful levels of welding fumes cannot be determined by relying on your body's senses. You may see smoke in the air, smell an irritant and not be adversely affected.

In order to accurately determine the level of the contaminants present, air quality testing equipment in the way of air sampling pumps are placed in the area and on the welder. This equipment pulls air through a filter for a specified amount of time. The sample is then evaluated at a laboratory to determine the levels of the exposure.

The degree of exposure present determines which type of ventilation system is most appropriate. In field locations, such as construction projects and shipyards, 'sucker' hoses can be set up to pull fumes from the welding zone. Welding booths with local exhaust hoses at each station gives the welder some flexibility and mobility in performing the operation.

There are situations when the welder must go to the work area and due to size, weight or the unwieldy configuration of the work piece, may require the use of a portable exhaust system. In some situations, laboratory-type hoods may be used for ventilation. This type of system creates a high velocity exhaust vacuum within an enclosure. Using Laboratory-type hoods allow only the welder's hands/arms in the enclosure while welding is being performed.

Determining the needed ventilation and/or respiratory protection must be taken very seriously. Systematically evaluate the process, exposures and possible controls to determine which will help ensure providing an employee a safe place to work.

Once protective measures have been determined, it is the responsibility of each welder and their supervisor to make sure they are being used properly. Taking a proactive step in reducing your exposure to welding fumes is the professional approach to working as a welder.

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MANUAL  
PLANS

# BENZENE AWARENESS PLAN/PROGRAM

## **BENZENE Exposure Safety Policy**

BCI will not engage in work which may result in benzene exposure in any form. In the event that an employee is exposed to Benzene in the course of performance of job duties, work will be stopped and clean up and removal of the benzene will be contracted out. Work will resume upon completion of the cleanup. In the event of continued exposure the Plan that follows will be enforced as a Program.

## **BENZENE/ CHEMICAL EXPOSURE**

In the course of our construction work, our workers may be exposed to benzene. Benzene is extremely hazardous and any materials containing benzene shall be treated with the utmost caution, and in accordance with the following sections. Benzene liquid is highly flammable and vapors may form explosive mixtures in air. Fire extinguishers must be readily available. Smoking is prohibited in areas where Benzene is used or stored. The characteristics of benzene are that it is toxic, colorless, has an aromatic odor, is not soluble in water and is flammable.

## **DEFINITIONS**

**Benzene (C (6) H (6)) (CAS Registry No. 71-43-2):** is a liquefied or gaseous benzene. It includes benzene contained in liquid mixtures and the benzene vapors released by these liquids. It does not include trace amounts of unreacted benzene contained in solid materials.

**Employee exposure:** exposure to airborne benzene which would occur if the employee were not using respiratory protective equipment.

**Regulated area:** any area where airborne concentrations of benzene exceed or can reasonably be expected to exceed, the permissible exposure limits, either the 8- hour time weighted average exposure of 1 ppm or the short-term exposure limit of 5 ppm for 15 minutes.

## **Permissible Exposure Limits (PEL's)**

- **Time-Weighted Average Limit (TWA)**
  - BCI shall assure that no employee is exposed to an airborne concentration of benzene in excess of one part of benzene per million parts of air (1 ppm) as an 8-hour time-weighted average.
- **Short-Term Exposure Limit (STEL)**
  - BCI shall assure that no employee is exposed to an airborne concentration of benzene in excess of five (5) ppm as averaged over any 15 minute period.

## **REGULATED AREAS**

BCI shall establish a regulated area wherever the airborne concentration of benzene exceeds or can reasonably be expected to exceed the permissible exposure limits, either the 8-hour time weighted average exposure of 1 ppm or the short-term exposure limit of 5 ppm for 15 minutes. Access to regulated areas shall be limited to authorized persons. Regulated areas shall be determined from the rest of the workplace in any manner that minimizes the number of employees exposed to benzene within the regulated area.



## **EXPOSURE MONITORING**

Determinations of employee exposure shall be made from breathing zone air samples that are representative of each employee's average exposure to airborne benzene. Representative 8-hour TWA employee exposures shall be determined on the basis of one sample or samples representing the full shift exposure for each job classification in each work area. Determinations of compliance with the STEL shall be made from 15 minute employee breathing zone samples measured at operations where there is reason to believe exposures are high, such as where tanks are opened, filled, unloaded or gauged; where containers or process equipment are opened and where benzene is used for cleaning or as a solvent in an uncontrolled situation. BCI may use objective data, such as measurements from brief period measuring devices, to determine where STEL monitoring is needed. Except for initial monitoring as required, where the employer can document that one shift will consistently have higher employee exposures for an operation, BCI shall only be required to determine representative employee exposure for that operation during the shift on which the highest exposure is expected.

## **INITIAL MONITORING**

Each employer who has a place of covered employment shall monitor each of these workplaces and work operations to determine accurately the airborne concentrations of benzene to which employees may be exposed. The administration of this monitoring program is the responsibility of the Safety Department. The initial monitoring required shall be completed by 60 days after the effective date of this standard or within 30 days of the introduction of benzene into the workplace. Where BCI has monitored, and the monitoring satisfies all other requirements, we may rely on such earlier monitoring results.

## **PERIODIC MONITORING AND MONITORING FREQUENCY**

If the monitoring reveals employee exposure at or above the action level but at or below the TWA, BCI shall repeat such monitoring for each such employee at least every year. If the monitoring reveals employee exposure above the TWA, BCI shall repeat such monitoring for each such employee at least every six (6) months. We may alter the monitoring schedule from every six months to annually for any employee for whom two consecutive measurements taken at least 7 days apart indicate that the employee exposure has decreased to the TWA or below, but is at or above the action level. Monitoring for the STEL shall be repeated as necessary to evaluate exposures of employees subject to short term exposures.

## **TERMINATION OF MONITORING**

If the initial monitoring reveals employee exposure to be below the action level BCI may discontinue the monitoring for that employee, except as otherwise required. If the periodic monitoring reveals that employee exposures, as indicated by at least two consecutive measurements taken at least 7 days apart, are below the action level BCI may discontinue the monitoring for that employee, except as otherwise required.

## **ADDITIONAL MONITORING**

BCI shall institute the exposure monitoring when there has been a change in the production, process, control equipment, personnel or work practices which may result in new or additional exposures to benzene, or when we have any reason to suspect a change which may result in new or additional exposures. Whenever spills, leaks, ruptures or other breakdowns occur that may lead to employee exposure, BCI shall monitor (using area or personal sampling) after the cleanup of the spill or repair of the leak, rupture or other breakdown to ensure that exposures have returned to the level that existed prior to the incident.

## **ACCURACY OF MONITORING**

Monitoring shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for airborne concentrations of benzene.

## **EMPLOYEE NOTIFICATION OF MONITORING RESULTS**

BCI shall, within 15 working days after the receipt of the results of any monitoring performed, notify each employee of these results in writing either individually or by posting of results in an appropriate location that is accessible to affected employees. Whenever the PELs are exceeded, the written notification shall contain the corrective action being taken by BCI to reduce the employee exposure to or below the PEL, or shall refer to a document available to the employee which states the corrective actions to be taken.

## **METHODS OF COMPLIANCE**

### **ENGINEERING CONTROLS AND WORK PRACTICES**

BCI shall institute engineering controls and work practices to reduce and maintain employee exposure to benzene at or below the permissible exposure limits, except to the extent that BCI can establish that these controls are not feasible. Wherever the feasible engineering controls and work practices which can be instituted are not sufficient to reduce employee exposure to or below the PELs, BCI shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection. Where BCI can document that benzene is used in a workplace less than a total of 30 days per year, BCI shall use engineering controls, work practice controls or respiratory protection or any combination of these controls to reduce employee exposure to benzene to or below the PELs, except that employers shall use engineering and work practice controls, if feasible, to reduce exposure to or below 10 ppm as an 8-hour TWA.

### **COMPLIANCE PROGRAM**

When any exposures are over the PEL, BCI shall establish and implement a written program to reduce employee exposure to or below the PEL primarily by means of engineering and work practice controls. The written program shall include a schedule for development and implementation of the engineering and work practice controls. These plans shall be reviewed and revised as appropriate based on the most recent exposure monitoring data, to reflect the current status of the program. Written compliance programs shall be furnished upon request for examination and copying to the Assistant Secretary, the Director, affected employees and designated employee representatives. BCI should be aware of Owners contingency plan provisions. Employees must be informed where benzene is used in host facility and aware of additional plant safety rules.

### **RESPIRATORY PROTECTION**

BCI shall provide respirators, and assure that they are used, where required. Respirators shall be used in the following circumstances: During the time period necessary to install or implement feasible engineering and work practice controls; In work operations for which BCI establishes that compliance with either the TWA or STEL through the use of engineering and work practice controls is not feasible, such as some maintenance and repair activities, vessel cleaning, or other operations where engineering and work practice controls are infeasible because exposures are intermittent in nature and limited in duration; In work situations where feasible engineering and work practice controls are not yet sufficient or are not required to reduce exposure to or below the PELs; and in emergencies.

### **RESPIRATOR SELECTION**

Where respirators are required or allowed under this section, BCI shall select and provide, at no cost to the employee, the appropriate respirator as specified in Table 1, and shall assure that the employee uses the respirator provided. BCI shall select respirators from among those jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health under the provisions of 30 CFR Part 11. Negative pressure respirators shall have filter elements approved by MSHA/NIOSH for organic vapors or benzene. Any employee who cannot wear a negative pressure respirator shall be given the option of wearing a respirator with less breathing resistance such as a powered air- purifying respirator or supplied air respirator.

## RESPIRATOR PROGRAM

BCI shall institute a respiratory protection program as required (Attachments 35 - 40).

### TABLE - RESPIRATORY PROTECTION FOR BENZENE

Airborne concentration of	Respirator type benzene or condition of use
Less than or equal to 10 ppm:	Half-mask air-purifying respirator with organic vapor cartridge
Less than or equal to 50 ppm:	Full face piece respirator with organic vapor cartridges, Full face piece gas mask with chin style canister
Less than or equal to 100 ppm:	Full face piece powered air-purifying respirator with organic vapor canister
Less than or equal to 1,000ppm:	Supplied air respirator with full face piece in positive-pressure mode
Greater than 1,000 ppm or unknown concentration:	Self-contained breathing apparatus with full face piece in positive pressure mode
Full face piece positive-pressure supplied-air respirator with auxiliary self-contained air supply	
Escape	Any organic vapor gas mask; or any self-contained breathing apparatus with full face piece
Firefighting	Full face piece self-contained breathing apparatus in positive pressure mode

*Footnote (1) Canisters must have a minimum service life of four (4) hours when tested at 150 ppm benzene, at a flow rate of 64 LPM, 25 deg. C, and 85% relative humidity for non-powered air purifying respirators. The flow rate shall be 115 LPM and 170 LPM respectively for tight fitting and loose fitting powered air-purifying respirators*

### PERSONAL PROTECTION EQUIPMENT:

Personal protective clothing and equipment such as boots, gloves, sleeves, aprons, eye and face protection shall be worn where appropriate to prevent eye contact and limit epidermal exposure to liquid benzene.

### MEDICAL SURVEILLANCE & EXAMINATIONS

Some of the health effects of Benzene, including eye & skin irritations, short term effects can be breathless, irritable, euphoria, etc. BCI shall make available a medical surveillance program for employees who are or may be exposed to benzene at or above the action level 30 or more days per year; for employees who are or may be exposed to benzene at or above the PELs 10 or more days per year; for employees who have been exposed to more than 10 ppm of benzene for 30 or more days in a year prior to the effective date of the standard when employed by their current employer; and for employees involved in the tire building operations called tire building machine operators, who use solvents containing greater than 0.1 percent benzene.

BCI shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician and that all laboratory tests are conducted by an accredited laboratory. Persons other than licensed physicians who administer the pulmonary function testing required by this section shall complete a training course in spirometer sponsored by an appropriate governmental, academic or professional institution. All examinations and procedures are provided without cost to the employee and at a reasonable time and place. Within 60 days of the effective date of this standard, or before the time of initial assignment, BCI shall provide each affected employee with a medical examination including the following elements:

A detailed occupational history which includes:

- Past work exposure to benzene or any other hematological toxins;
- A family history of blood dyscrasias including hematological neoplasms;
- A history of blood dyscrasias including genetic hemoglobin abnormalities, bleeding abnormalities, abnormal function of formed blood elements;
- A history of renal or liver dysfunction;
- A history of medicinal drugs routinely taken;
- A history of previous exposure to ionizing radiation; and
- Exposure to marrow toxins outside of the current work situation.
- A complete physical examination.
- Laboratory tests. A complete blood count including a leukocyte count with differential, a quantitative thrombocyte count, hematocrit, hemoglobin, erythrocyte count and erythrocyte indices (MCV, MCH, MCHC). The results of these tests shall be reviewed by the examining physician.
- Additional tests as necessary in the opinion of the examining physician, based on alterations to the components of the blood or other signs which may be related to benzene exposure

For all workers required to wear respirators for at least 30 days a year, the physical examination shall pay special attention to the cardiopulmonary system and shall include a pulmonary function test.

No initial medical examination is required if adequate records show that the employee has been examined in accordance with the procedures of this section within the twelve months prior to the effective date of this standard.

## **PERIODIC EXAMINATIONS**

BCI shall provide each affected employee with a medical examination annually following the previous examination.

These periodic examinations shall include at least the following elements:

- A brief history regarding any new exposure to potential marrow toxins, changes in medicinal drug use, and the appearance of physical signs relating to blood disorders:
- A complete blood count including a leukocyte count with differential, quantitative thrombocyte count, hemoglobin, hematocrit, erythrocyte count and erythrocyte indices (MCV, MCH, MCHC); and
- Appropriate additional tests as necessary, in the opinion of the examining physician, in consequence of alterations in the components of the blood or other signs which may be related to benzene exposure.

Where the employee develops signs and symptoms commonly associated with toxic exposure to benzene, BCI shall provide the employee with an additional medical examination which shall include those elements considered appropriate by the examining physician. For persons required to use respirators for at least 30 days a year, a pulmonary function test shall be performed every three (3) years. A specific evaluation of the cardiopulmonary system shall be made at the time of the pulmonary function test.

## **EMERGENCY EXAMINATIONS**

In addition to the surveillance required, if an employee is exposed to benzene in an emergency situation, BCI shall have the employee provide a urine sample at the end of the employee's shift and have a urinary phenol test performed on the sample within 72 hours. The urine specific gravity shall be corrected to 1.024. If the result of the urinary phenol test is below 75 mg phenol/L of urine, no further testing is required. If the result of the urinary phenol test is equal to or greater than 75 mg phenol/L of urine, BCI shall provide the employee with a complete blood count including an erythrocyte count, leukocyte count with differential and thrombocyte count at monthly intervals for a duration of three (3) months following the emergency exposure. If any of the conditions specified exists, then the further requirements of this section shall be met and BCI shall, in addition, provide the employees with periodic examinations if directed by the physician.

## **ADDITIONAL EXAMINATIONS AND REFERRALS**

Where the results of the complete blood count required for the initial and periodic examinations indicate any of the following abnormal conditions exist, then the blood count shall be repeated within 2 weeks:

- The hemoglobin level or the hematocrit falls below the normal limit [outside the 95% confidence interval (C.I.)] as determined by the laboratory for the particular geographic area and/or these indices show a persistent downward trend from the individual's pre-exposure norms; provided these findings cannot be explained by other medical reasons.
- The thrombocyte (platelet) count varies more than 20 percent below the employee's most recent values or falls outside the normal limit (95% C.I.) as determined by the laboratory.
- The leukocyte count is below 4,000 per mm<sup>3</sup> or there is an abnormal differential count.

If the abnormality persists, the examining physician shall refer the employee to a hematologist or an internist for further evaluation unless the physician has good reason to believe such referral is unnecessary.

BCI shall provide the hematologist or internist with the information required to be provided to the physician and the medical record required to be maintained. The hematologist's or internist's evaluation shall include a determination as to the need for additional tests, and BCI shall assure that these tests are provided.

## **INFORMATION PROVIDED TO THE PHYSICIAN.**

BCI shall provide the following information to the examining physician:

- A copy of this regulation and its attachments;
- A description of the affected employee's duties as they relate to the employee's exposure;
- The employee's actual or representative exposure level;
- A description of any personal protective equipment used or to be used; and
- Information from previous employment-related medical examinations of the affected employee which is not otherwise available to the examining physician.

## **PHYSICIAN'S WRITTEN OPINIONS**

For each examination under this section, BCI shall obtain and provide the employee with a copy of the examining physician's written opinion within 15 days of the examination. The written opinion shall be limited to the following information:

- The occupationally pertinent results of the medical examination and tests;
- The physician's opinion concerning whether the employee has any detected medical conditions which would place the employee's health at greater than normal risk of material impairment from exposure to benzene;
- The physician's recommended limitations upon the employee's exposure to benzene or upon the employee's use of protective clothing or equipment and respirators.
- A statement that the employee has been informed by the physician of the results of the medical examination and any medical conditions resulting from benzene exposure which require further explanation or treatment.

The written opinion obtained by BCI shall not reveal specific records, findings and diagnoses that have no bearing on the employee's ability to work in a benzene-exposed workplace.

## **MEDICAL REMOVAL PLAN**

When a physician makes a referral to a hematologist/internist as required, the employee shall be removed from areas where exposures may exceed the action level until such time as the physician makes a determination. Following the examination and evaluation by the hematologist/internist, a decision to remove an employee from areas where benzene exposure is above the action level or to allow the employee to return to areas where benzene exposure is above the action level shall be made by the physician in consultation with the hematologist/internist. This decision shall be communicated in writing to BCI and employee.

In the case of removal, the physician shall state the required probable duration of removal from occupational exposure to benzene above the action level and the requirements for future medical examinations to review the decision. For any employee who is removed, BCI shall provide a follow-up examination. The physician, in consultation with the hematologist/internist, shall make a decision within 6 months of the date the employee was removed as to whether the employee shall be returned to the usual job or whether the employee should be removed permanently. Whenever an employee is temporarily removed from benzene exposure, BCI shall transfer the employee to a comparable job for which the employee is qualified (or can be trained for in a short period) and where benzene exposures are as low as possible, but in no event higher than the action level. BCI shall maintain the employee's current wage rate, seniority and other benefits. If there is no such job available, we shall provide medical removal protection benefits until such a job becomes available or for 6 months, whichever comes first.

# FIRE SAFETY PLAN

## OBJECTIVE

The major goal of BCI in creating a Fire Safety Compliance Program is to minimize the number of accidents and injuries due to workplace fires. Because we recognize that fires pose a significant risk, we have committed ourselves to doing as much as is practically possible to protect employees from the dangers of workplace fires.

## ASSIGNMENT OF RESPONSIBILITY

**Plan Administrator:** The Safety Department shall manage and update the Workplace Fire Safety Plan for BCI, and maintain all records pertaining to the plan.

**Management:** BCI will implement this plan and provide safe equipment that, when used properly, will minimize or eliminate risk of occupational injuries and deaths. BCI management will ensure proper adherence to this plan through periodic audits.

**Supervisors:** Supervisors shall themselves follow and ensure that their employees are trained in and follow proper fire safety procedures as outlined in this plan.

**Employees:** Employees are responsible for adhering to proper fire safety procedures as described in this plan. Employees are also responsible for reporting all fire hazards to the Safety Department immediately or within 24 hours.

**Contractors:** Contract employees shall be responsible for complying with this plan, and may be provided the training described herein by the Safety Department.

## FIRE HAZARDS

To be able to stop unwanted fires, BCI has first identified the major fire hazards (fuel sources) associated with the normal use and occupancy of the premises. These major fire hazards are listed in attachment 27. Our Safety Department is responsible for seeing that this listing is completed. The listing form that is used allows us to record the following information about these fire hazards:

- Name of fuel source
- Quantity stored on premise
- Location(s) of item
- Type of fire protection equipment or extinguishing agent
- Special extinguishing or other information

## HOUSEKEEPING PROCEDURES

Poor housekeeping procedures are often a primary or contributing cause to workplace fires. BCI has established procedures for regular storage and cleanup of flammable waste. Our Safety Officers are the persons who are responsible for seeing that this listing is completed. The listing form that is used allows us to record the following information about flammable waste and the associated housekeeping procedures:

- Name of flammable waste
- Quantity stored on premise
- Location(s) of waste
- Person responsible for handling, packaging and disposal.

## **METHODS OF HANDLING, PACKAGING AND DISPOSAL.**

### **Ignition Sources**

Fires require sources of ignition. To prevent fires BCI has listed sources of ignition (Attachment 27). The Safety Officers are the persons who are responsible for seeing that this listing is completed. This information is listed on page 8. The listing form that is used allows us to record the following information about ignition sources:

- Ignition source
- Location
- Method used to control ignition source
- Person responsible for monitoring ignition source

### **PORTABLE FIRE EXTINGUISHERS**

OSHA allows employers to request properly trained employees to attempt to extinguish incipient fires. The use of portable fire extinguishers should only be done by employees who have been trained to use them. Employees attempting to extinguish fires should only do so within the guidelines taught them in training.

BCI has determined that in the event of a fire employees should attempt to use portable fire extinguishers.

Portable fire extinguishers for the Rapid City office are maintained by Armstrong Extinguisher Service. At work sites, the fire extinguisher services will be contracted to a local vendor. Any damaged or used fire extinguishers should be reported to the Safety Department immediately.

### **FIRE EMERGENCY PROCEDURES**

During an actual fire emergency it is important that employees understand BCI procedures. These procedures are outlined below.

- **ACTIVATE** the fire alarm or contact 911.
- **ASSIST** others in exiting the building.  
Use the nearest clear exit route as marked by the site map at the end of this plan.
- **ATTEMPT** to extinguish.
- **ASSEMBLE** at the designated location outside of the building.



## **FIRE SAFETY TRAINING**

In order to make sure that our employees are appropriately trained before a fire emergency, they are given training on the following subjects:

- Fire and its hazards
- How fire works
- Preventing fires
- Classes of fires
- Preparing for a fire emergency
- Procedures during a fire emergency

BCI periodically provides emergency drill practices. The frequency of these drills is determined at the discretion of management.

The Safety Department is responsible for overseeing these training and drill activities. They will also make sure that new employees in our facilities have had the appropriate training and that each employee undergoes periodic retraining as necessary.

# HEAT ILLNESS - COLD EXPOSURE PREVENTION PLAN/PROGRAM

For employees who work in outdoor places of employment or on job tasks in other areas at those times when the environmental risk factors for heat illness or cold exposure are present, are at risk for developing weather temperature related illnesses if they do not protect themselves appropriately. The objective of this program is employee awareness regarding weather temperature related illnesses symptoms, ways to prevent illness, and what to do if symptoms occur.

## **POLICY**

It is the policy of BCI that any employee participating in job tasks when environmental risk factors for weather temperature related illnesses are present will comply with the procedures in this document. Heat Illness and Cold Exposure procedures shall be in writing and made available to employees.

## **PURPOSE**

To ensure that all employees of BCI are protected from weather temperature related illnesses while working on job tasks where environmental risk factors for weather temperature related illnesses are present and to establish the minimum requirements for working in this environment (Attachment 28).

## **DEFINITIONS**

**Acclimatization:** The temporary adaptation of the body to work in various temperatures that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for about two hours per day in the heat.

**Environmental Risk Factors For Weather Temperature Related Illnesses:** Is the working conditions that create the possibility that weather temperature related illnesses could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personnel protective equipment worn by employees.

**Weather Temperature Related Illnesses:** Is a serious medical condition resulting from the body's inability to cope with a particular weather induced load induced on the body and can include:

- heat cramps
- heat exhaustion
- heat syncope
- heat stroke
- sunburns
- frostbite
- lethargy

**Personal Risk Factors For Weather Temperature Related Illnesses:** The factors that affect the body's water retention or other physiological responses to weather temperature related problems, which can include:

- an individual's age
- degree of acclimatization
- health
- water consumption
- alcohol consumption
- caffeine consumption
- use of prescription medications

**Preventative Recovery Period:** The period of time to recover from the weather temperature in order to prevent weather temperature related illnesses.

## **RESPONSIBILITIES**

The Safety Department or a designated representative is responsible for:

- Assisting with providing training to all potentially impacted employees and their supervisors on the risks and prevention of weather temperature related illnesses, including how to recognize symptoms and respond when they appear.

Directors, Managers, and Supervisors are responsible for:

- Identifying all employees who are required to work outdoors where potential weather temperature related illnesses could occur and identifying the supervisor of the employees. These procedures shall include, but are not limited to:
  - Effective communication by voice, observation or electronic means
  - Observation of employees for alertness and signs/symptoms of any weather temperature related illnesses.
  - Reminding employees to drink water throughout the shift
  - Closely supervising employees for their first 14 days of employment
  - Assuring that adequate water and shade are available at a job site when environmental risk factors for heat illness are present.

## **AT OR BELOW 25 DEGREES FAHRENHEIT**

Every employee shall have timely access to a method to warm themselves upon request. For temperatures at or below 25 degrees Fahrenheit, one or more warming areas shall be provided at all times while employees are present. Shelter from the weather shall accommodate at least 25% of employees on shift at any one time.

Ensuring that all affected employees have received proper training on cold exposure.

Ensuring that the requirements in this document are followed.

Contacting EMS to request emergency medical services in the event medical assistance is required.

Affected employees are responsible for:

- Complying with the provisions of this Heat Illness – Cold Exposure Prevention Program, as described in this document and in the training sessions they attend.
- Ensuring they have hot coffee or hot chocolate with marshmallows available at all times when the environmental risk factors for cold exposure are present.
- Ensuring they have access to an area to decrease exposure to the cold to prevent or recover from cold exposure related symptoms.
- Reporting cold related illness symptoms to your supervisor.

## **AT OR ABOVE 85 DEGREES FAHRENHEIT**

Every employee shall have timely access to shade upon request. For temperatures at or above 85 degrees Fahrenheit, one or more areas with shade shall be provided at all times while employees are present. Shade shall accommodate at least 25% of employees on shift at any one time.

- Ensuring that all affected employees have received proper training on heat illness prevention.
- Ensuring that the requirements in this document are followed.
- Contacting EMS to request emergency medical services in the event medical assistance is required.
- Affected employees are responsible for:
  - Complying with the provisions of this Heat Illness Prevention Program, as described in this document and in the training sessions they attend.
  - Ensuring they have drinking water available at all times when the environmental risk factors for heat illness are present.
  - Ensuring they have access to a shaded area to prevent or recover from heat related symptoms.
  - Reporting heat related illness symptoms to your supervisor.

## **BASIC REQUIREMENTS**

All employees shall be identified who are required to work where environmental factors for weather temperature related illnesses are present.

Training shall be provided for all potentially impacted employees working where environmental risk factors for weather temperature related illnesses are present and their supervisors. Training information shall include but not be limited to the topics listed in the training section of this written program. All potentially impacted employees and supervisors who supervise these employees must be trained on the risks and prevention of weather temperature related illnesses, including how to recognize symptoms and respond when they appear.

Physical factors that contribute to weather related illness should be taken into consideration before performing a task. The most common physical factors that can contribute to weather related illness are:

- type of work
- level of physical activity
- duration
- clothing color
- Clothing cloth weight
- Clothing cloth breathability
- Clothing cloth resistance to wind and water

Where a continuous, plumbed water supply is not available, potable drinking water in the quantity of 1 quart per hour shall be available at the beginning of the shift, and at all times for each employee for the duration of the entire shift while working outdoors in the heat. Supervisors shall remind employees to drink frequently and this topic will be addressed at tailgate meetings.

Employees shall have access to a shaded area for recover from heat illness symptoms and shelter area to remove the employee from cold weather where they can take their rest breaks. The importance of taking rest breaks and recognizing when a preventative recovery period is needed allowing employees to protect from the weather shall be addressed at tailgate meetings.

In the event an employee feels discomfort from the weather, a preventative recovery period is needed to allow the employee to cool down or warm up and prevent the onset of a weather related illness.

Supervisors and employees shall carry radios or other means of communication to ensure that emergency services can be called. Verification that the radios or other means of communication are functional at the worksite shall be carried out prior to each shift.

## **TRAINING**

Training shall be provided for employees working on job tasks where environmental risk factors for heat illness are present, and training for their respective supervisors.

All employees working on job tasks where environmental risk factors for weather related illness are present shall receive instruction before being assigned to work tasks. Training topics shall include the following:

- Environmental and personal risk factors for weather related illness.
- Procedures for identifying, evaluating, and controlling exposures to the environmental and personal risk factors for weather related illness. Procedures must be in place to control the effects of environmental factors that can contribute to weather related illness.
- Employees who experience excessive sweating require frequent consumption of small quantities of water, up to 4 cups per hour when working in extreme conditions of heat.
- Importance of acclimatization.
- Different types, signs, and symptoms of weather related illness.
- Importance of immediately reporting symptoms or signs of weather illness in themselves or in coworkers to their supervisor.
- Procedures for responding to symptoms of possible weather related illness, including how emergency medical services will be contacted and provided, should they become necessary.
- Procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider.
- Procedures for ensuring that in the event of an emergency, clear and precise directions to the work site can and will be provided as needed to emergency responders.

## **SUPERVISORS OF AFFECTED EMPLOYEES**

Supervisors or their designees shall receive training on the following topics prior to being assigned to supervise outdoor employees:

- Information as detailed above in employee training requirements.
- Procedures the supervisor shall follow to implement the provisions of this Program to prevent weather related illness.
- Supervisors must ensure personal factors that contribute to weather related illness are taken into consideration before assigning a task where there is the possibility of a weather related illness occurring.
- Procedures the supervisor shall follow when an employee exhibits symptoms consistent with possible weather related illness, including emergency response procedures.

# HEXAVALENT CHROMIUM PLAN/PROGRAM

## SAFETY POLICY

BCI will not engage in work which may result in Hexavalent Chromium exposure if possible. In the event that the welder during the course of work is exposed to Hexavalent Chromium, work will be stopped and respiratory protection procedures will be instituted. Work can resume upon establishment of respiratory protection being in place.

This program is intended to convey the potential hazards associated with working with hexavalent chromium (aka chromium (VI) or Cr (VI)) and to provide a means by which employees can protect themselves, their co-employees, the public and the environment. While significant exposure to hexavalent chromium would not be expected when working at typical construction sites, employees can best protect themselves by being aware of hexavalent chromium concerns and where it might be encountered.

Chromium is a naturally occurring element found in rocks, animals, plants and soil. This naturally occurring form of chromium is called trivalent chromium (chromium +3 or Cr+3) and is an essential nutrient, meaning that the body needs small amounts of it to maintain health. However, other forms of chromium such as hexavalent and elemental chromium are produced by industrial processes and can cause significant health effects.

Hexavalent chromium exposure can occur by inhalation, ingestion and by skin contact. Inhaling hex chrome dust can result in irritation to the nose, causing runny nose, nose bleeds, ulcers and even holes in the nasal wall upon high exposures. Ingesting or eating hex chrome can result in stomach upset and ulcers as well as kidney and liver damage. Skin contact with hex chrome can cause skin irritation and some individuals have allergic reactions to this material. Finally, studies have shown that excessive exposure to this compound may increase the risk of lung cancer.

The greatest potential for exposure to employees is in industrial facilities that are making chromium containing pigments, dyes, inks and plastics as well as chrome plating operations. While construction site exposure potential is significantly less, employees may be exposed to hex chrome when welding on stainless steel or chromium alloys or conducting hot work on paints or coatings that contain chromium pigments. Another potential source is contact with Portland cement which may have small amounts of hexavalent chromium as a contaminant.

## EXPOSURE ASSESSMENT

### Initial Determination:

Each project shall determine whether the potential for hexavalent chromium exposure exists prior to the start of work. Potential sources of hexavalent chromium exposure may be identified in the owner specification or related documents. Information related to Hazard Communication should be reviewed in detail. References to coated or painted steel that involves hot work such as torch cutting, welding, brazing, or other application of heat shall be considered potential flags as would any hot work operation on stainless steel or other unidentified metal alloys or mixtures.

Additionally, a survey of the project site should be conducted to ensure that other potential sources are identified prior to work commencing. Ongoing assessment must be conducted as surfaces not visible at the start of a project may become apparent as work progresses.

If the initial determination establishes that hexavalent chromium may be present in coatings or paints, paint chip samples shall be collected and forwarded to an accredited laboratory for analysis. The presence of hexavalent chromium at detectable levels establishes the need for exposure monitoring as described below. Stainless steel surfaces, by definition, contain hexavalent chromium and working on such surfaces utilizing hot methods also requires exposure monitoring.

Activities that may result in chromium exposure:

- Demolition or salvage of structures where chromium or materials containing chromium are present;
- New construction, alteration, repair or renovation of structures, substrates, or portions that contain chromium or chromium containing materials;
- Installation of products containing chromium;
- Working with dry or wet Portland cement mixtures that contain hexavalent chromium as a contaminant.

### **Initial Exposure Monitoring**

If the presence of chromium has been confirmed in a material, work activities involving that material shall be subject to exposure monitoring. A representative number of employees conducting the activity shall be identified and personal 8 hr. Time Weighted Average (TWA) sampling shall be conducted. The employee expected to have the highest potential chromium exposure shall be included in the representative sampling program.

### **Periodic Exposure Monitoring**

Results less than the Action Level (AL) - If initial monitoring indicates that exposures are below the Action Level of 2.5 ug/m<sup>3</sup>, additional monitoring for employees represented by such monitoring is not required.

Results at or above the Action Level (AL) – If initial monitoring results are equal to or greater than the Action Level of 2.5 ug/m<sup>3</sup>, periodic monitoring for those activities shall be conducted every 6 months. Regulated areas must be established when an employee's exposure is or is expected to be in excess of the PEL. Regulated areas shall be marked with warning signs to alert employees. Access is restricted to "authorized persons".

Results above the Permissible Exposure Limit (PEL) – If initial monitoring results are greater than the Permissible Exposure Limit of 5.0 ug/m<sup>3</sup>, periodic monitoring shall be conducted every 3 months.

If periodic monitoring indicates that an exposure level is below the Action Level, and the result is confirmed by a second monitoring episode conducted at least 7 days later, periodic monitoring for that particular activity may be discontinued.

Additional exposure monitoring shall be conducted when there has been a change in the production process, raw materials, equipment, personnel, work practices, or control methods that are used.

### **Employee Notification**

Employees shall be notified of air sampling results within 5 days of results being received by BCI. Air sampling results shall be provided to employees by hand delivery at the worksite or by certified letter delivery. If the employee receives the letter by hand, he/she will be required to sign off on the air monitoring results to document that they have received the notification.

In the event that the monitoring indicates that employee exposure is above the PEL, BCI shall describe in the written correspondence to the employee the corrective steps being taken to reduce the exposure to less than the PEL. Employees are not permitted to work unrestricted (that is, exposed to) environments that are above the PEL of 5.0 ug/m<sup>3</sup>.

## **METHODS OF COMPLIANCE**

### **Engineering and Work-Practice Controls**

Engineering and work practice controls shall be implemented that reduce and maintain employee exposure to or below the PEL. If BCI can demonstrate that such measures are not feasible or sufficient, they shall be used to reduce exposure to the lowest level achievable, and they shall be supplemented by the use of respiratory protection as described in the Respiratory Protection section of this document.

In the event that BCI can demonstrate that a process or task does not result in any employee exposure to hexavalent chromium above the PEL for 30 or more days per year, the requirement to implement engineering and work practice

controls does not apply to the task and personal protective equipment can be implemented immediately as an exposure control measure.

Employee rotation to different jobs shall not be used as a means of achieving compliance with the chromium standard.

Appropriate engineering controls that may be implemented include but are not limited to:

- HEPA vacuum shrouded scalers and grinders;
- HEPA vacuum blasters;
- Chemical paint stripping;
- Dust collection / ventilation;
- Removing paint before burning;
- Cleaning with HEPA (high efficiency particulate air) filter vacuums;
- Wet methods to remove dust;
- Use of long cutting torches to keep employees further away from any fumes that are generated;
- Use of local exhaust ventilation equipped with HEPA filtration at the point of fume generation;
- Use of mechanical ventilation to move fumes and dust away from employees; and
- Positioning employees upwind or otherwise outside of visible fume or dust clouds.

## **HEXAVALENT CHROMIUM PROGRAM**

This document shall be considered the governing compliance program when addressing hexavalent chromium exposure. This will be further supplemented by site- specific programs including the worksite Construction Plan and BCI Respiratory Protection Program.

The Construction Plan shall detail:

- All specific elements of the activity;
- Engineering and administrative controls;
- Respiratory protection; and
- Personal Protective Equipment (PPE)

PPE shall be furnished at no cost by BCI. PPE must be provided when there is a hazard from skin or eye contact. Gloves, aprons, coveralls, goggles, foot covers etc. Contaminated PPE will be removed at the end of the work shift. Employer must clean, launder, repair and replace protective clothing as needed.

Where work involving hexavalent chromium is subcontracted out, the Subcontractor shall be responsible for providing a Site-Specific Compliance Program. This program shall be approved by the Safety Department prior to the Subcontractor commencing work.

### **Respiratory Protection**

Respirator usage must comply with all aspects of BCI's Respiratory Protection Program. When required, they shall be worn, used, stored, cleaned and maintained in a manner consistent with BCI Respiratory Protection Program.

Respirator usage shall not be discontinued or modified without the approval of the Project Superintendent and Safety Department, who will evaluate air monitoring data and other pertinent information prior to downgrading or discontinuing respirator usage.



## **Protective Work Clothing and Equipment**

If an operation poses the potential to result in skin or eye contact with hexavalent chromium, BCI shall provide protective clothing and equipment to the employee. Where issued, employees are required to wear this equipment. Such equipment may be required during the initial installation and implementation of engineering and work practice controls, until monitoring suggests that hexavalent chromium exposure is not a concern.

### **Removal and Storage**

Employees who wear protective clothing to minimize exposure to hexavalent chromium shall comply with the following requirements:

- All protective clothing and equipment shall be removed at the end of the work shift or at the completion of tasks involving exposure to hexavalent chromium;
- Hexavalent chromium contaminated clothing shall not be removed from the site, except for by an employee or employee whose job it is to launder, clean or dispose of such equipment; and
- All potentially contaminated clothing or equipment shall be stored and transported in sealed, impermeable bags or containers and labeled appropriately.

### **Cleaning and Replacement**

BCI shall be responsible for laundering, cleaning, repairing or replacing all protective clothing or equipment in order to maintain its effectiveness.

Hexavalent chromium shall not be removed from clothing by any methods that disperse the material into the air or onto an employee's body. This includes blowing, shaking, slapping or other aggressive means of removal. Vacuuming with a HEPA vacuum would be an acceptable means of removal.

Any employee involved in laundering or cleaning protective clothing shall be informed of the potential health effects of hexavalent chromium and the need to minimize airborne levels and skin and eye contact.

## **HYGIENE FACILITIES AND PRACTICES**

### **Change Areas**

If site conditions require the use of protective clothing or equipment, BCI shall provide change areas for employee usage. These areas will be equipped with separate storage facilities for protective work clothing and equipment and for street clothes to prevent cross-contamination.

At no time shall employees leave the job wearing any protective clothing or equipment.

### **Washing Facilities**

BCI shall provide washing facilities where employees have potential skin contact with hexavalent chromium. These facilities are supplied with clean water, non-alkaline soap and paper towels.

Employees shall wash exposed skin areas as appropriate to remove dust, cement or other materials. Regardless of whether direct exposure is believed to have occurred, all employees shall wash their hands and face at the end of each shift and prior to eating, drinking, smoking, chewing tobacco or gum, applying cosmetics or using the toilet.

### **Eating and Drinking Areas**

Employees shall not enter eating and drinking areas while wearing protective work clothing or equipment.

All area eating and drinking surfaces shall be kept as free as practicable of hexavalent chromium. This can be accomplished by periodic HEPA vacuuming and/or wet wiping of all horizontal surfaces.

## **Prohibited Activities**

Employees shall not eat, drink, smoke, chew tobacco or gum or apply cosmetics in areas where skin or eye contact with hexavalent chromium may occur.

## **MEDICAL SURVEILLANCE**

BCI shall make medical surveillance available, at no cost to the employee and at a reasonable time and place, where employees:

- Are occupationally exposed to hexavalent chromium at or above the PEL for 30 or more days per year;
- Are experiencing signs or symptoms of adverse health effects associated with hexavalent chromium exposure; or are exposed in an emergency.

## **Frequency of Examination**

BCI makes medical examinations available:

- Within 30 days of initial assignment, unless the employee has received a hexavalent chromium-related medical exam within the past 12 months;
- Annually;
- Within 30 days after a licensed health care provider provides a written medical opinion recommending an additional examination;
- Whenever an employee shows signs or symptoms of adverse health effects associated with hexavalent chromium;
- Within 30 days after exposure during an emergency which results in an uncontrolled release of hexavalent chromium; or
- At the termination of employment, unless the last examination that meets the requirement of the standard was less than 6 months prior to the date of termination.

## **Contents of Examination**

Hexavalent chromium medical examinations shall include the following:

- Medical and Work History emphasizing:
  - Past, present and anticipated future exposure to hexavalent chromium
  - Any history of respiratory dysfunction
  - Any history of asthma, dermatitis, skin ulceration or nasal septum perforation
  - Smoking status and history
  - A physical examination of the skin and respiratory tract; and
  - Any tests deemed necessary by the examining healthcare provider
- BCI shall ensure that the healthcare provider is given the following information:
  - A description of the affected employee's former, current and anticipated duties related to hexavalent chromium;
  - The employee's former, current and anticipated levels of occupational exposure to hexavalent chromium;
  - A description of the personal protective equipment used or to be used by the employee, including when and how long the employee has used the equipment; and
- Information from records of employment-related medical examinations previously provided to the affected employee that are currently within the control of BCI
- BCI shall also ensure that the healthcare provider is given a copy of the hexavalent chromium standard.

## **Healthcare Provider Medical Opinion**

The healthcare provider shall provide a medical opinion regarding each examination within 30 days of examining the employee. This medical opinion shall contain the following:

- The providers opinion as to whether the employee has any detectable medical condition that would place the employee at increased risk of material impairment to health from further exposure to hexavalent chromium;
- Any recommended limitations on the employee's exposure to hexavalent chromium or on the use of respirators; and
- A statement that the provider has explained to the employee the results of the medical examination, including any medical conditions associated with hexavalent chromium exposure that require further evaluation or treatment, and any special provisions for protective clothing or equipment.
- The healthcare provider shall not reveal to BCI specific findings or diagnoses not related to occupational exposure to chromium.
- BCI shall provide the employee with a copy of the healthcare provider's medical opinion within two weeks of receiving it.

## **HOUSEKEEPING**

Housekeeping of the work environment can decrease the potential for hexavalent chromium exposure. Appropriate housekeeping methods include:

- All surfaces shall be kept as free as practical of hexavalent chromium accumulations;
- Compressed air shall not be used for cleaning;
- Vacuuming is the preferred choice for cleaning, however, wet methods such as washing, wet sweeping, wet shoveling and wet brushing may be used when vacuuming is not practical; and
- Vacuums will be equipped with HEPA filters and shall be emptied in a manner that minimized the dispersion of chromium into the air.

## **EMPLOYEE INFORMATION AND TRAINING**

BCI shall ensure that all employees are informed regarding the requirements of the hexavalent chromium standard. At a minimum, they should be familiar with the following:

- The contents of the standard; and
- The purpose and description of the medical surveillance program.
- This training is in addition to the coverage provided in Hazard Communication training (Attachment 20).

## **RECORDKEEPING REQUIREMENTS**

### **Air Monitoring**

BCI is responsible for maintaining an accurate and complete record of all air monitoring conducted to comply with the requirements of the hexavalent chromium standard. At a minimum, this record shall include:

- Sample dates for all air monitoring;
- The operation being monitored;
- Sampling and analytical methods being employed and information supporting the accuracy of each;
- Number, duration and results of completed samples;
- Type of PPE worn during sampling; and
- Name, social security number and job classification of all employees being represented by the monitoring, indicating which employees were actually monitored.

Initial and periodic sampling results shall be stored onsite and at the Corporate Safety Department. All support documentation including field worksheets, Chain of Custody form copies and associated documents shall be stored as part of the exposure monitoring record.

All monitoring records shall be maintained and made available to employees in accordance with 29 CFR 1910.1020.

### **Historical Monitoring Data**

In the event that historical monitoring data was used to determine current exposure to hexavalent chromium, the record shall include data that reflects the following:

- The data were collected using methods that meet the accuracy requirements of the standard;
- The processes and work practices that were in use when the historical data were collected are essentially the same as the operation being assessed;
- The hexavalent chromium containing material being assessed is essentially similar to the material assessed in the historical information; and
- The environmental conditions between the current operation being assessed and those present when the historical data were collected are essentially the same.

### **Objective Data**

BCI shall maintain a record of all of the objective data that was used to determine employee exposure. This includes the following at a minimum:

- The chromium containing material in question;
- The source of the objective data;
- The testing protocol and results of testing regarding the release of chromium from the material under typical conditions;
- A description of the process, operation or activity and how that supports the determination that was made; and
- Other data relevant to the process, operation, activity, material or employee exposures.

## **MEDICAL SURVEILLANCE**

Medical surveillance shall be provided when an employee experiences signs or symptoms of the adverse health effects of Hexavalent Chromium (dermatitis, asthma, bronchitis, etc.). Medical evaluations will be provided at no cost to employees. Examinations will be performed by or under the supervision of a physician or other licensed health care professional. BCI shall maintain an accurate record for each employee covered by medical surveillance. The record shall include the following:

- Employee name and social security number;
- A copy of the health care provider's written opinion;
- A copy of the information provided to the health care providers as required by the standard; and
- A copy of the employee's training record.

## **RESPONSIBILITIES**

Project Management shall:

- Be required to attend a half day supervisory hexavalent chromium safety training course;
- Assess operations and project conditions in which employees or the general public may be exposed to hexavalent chromium;
- Institute engineering and work practice controls whenever feasible to reduce employee exposure to lead below 5  $\mu\text{g}/\text{m}^3$ ;
- Provide all necessary Personal Protective Equipment, respirators, hygiene facilities, etc. for employees performing operations with hexavalent chromium exposure;
- Provide training for employees performing operations with potential hexavalent chromium exposure;
- Ensure all employees working with hexavalent chromium are familiar with BCI's medical surveillance program;  
and
- Maintain all employee medical surveillance records and hexavalent chromium monitoring records.

The Employee shall:

- Take part in hexavalent chromium field training safety training prior to taking part in any operation involving hexavalent chromium exposure;
- Follow up on procedures or work plans established by their supervisors for working with hexavalent chromium exposures;
- Use all personal protective equipment issued to them for use when working with hexavalent chromium exposures;  
and
- Take part in the project's medical surveillance program when working with hexavalent chromium exposures.

# HYDROGEN SULFIDE (H<sub>2</sub>S)

## PLAN/PROGRAM

### POLICY

BCI will not engage in work which may result in Hydrogen Sulfide exposure if possible. In the event that the employee during the course of work is exposed to Hydrogen Sulfide (Attachment 29), work will be stopped and respiratory protection procedures will be instituted. Work can resume upon establishment of respiratory protection being in place.

### BACKGROUND

Sulfur may be present in crude oil as hydrogen sulfide (H<sub>2</sub>S), as compounds (e.g. mercaptans, sulfides, disulfides, thiophenes, etc.), or as elemental sulfur. Each crude oil has different amounts and types of sulfur compounds, but as a rule the proportion, stability, and complexity of the compounds are greater in heavier crude-oil fractions. As part of the work of BCI, our employees may be exposed to H<sub>2</sub>S - especially when working in client-owned compressor sites and refineries. Hydrogen sulfide is a primary contributor to corrosion in refinery processing units and piping. Other corrosive substances are elemental sulfur and mercaptans. Possible locations where employees may be exposed to H<sub>2</sub>S during their job functions may be, but not limited to: Drilling Operations, Recycled Drilling Mud, Water from sour crude wells, Blowouts, Tank Gauging (tanks at producing, pipeline & refining operations), Field Maintenance, Tank batteries and wells and power line installation in refinery and processing sites.

Hydrogen Sulfide is a colorless gas at normal temperature and pressure with an odor similar to that of rotten eggs. H<sub>2</sub>S is also soluble in water, and can be found in wastewater. In pure form, H<sub>2</sub>S is flammable. Moreover, the corrosive sulfur compounds have an obnoxious odor. However, presence of this gas may deaden the sense of smell so odor alone cannot be used for detection. In cases of extreme low temperature and/ or high pressure H<sub>2</sub>S may be a liquid.

### DEFINITIONS:

**Sour Gas:** Natural gas that contains corrosive, sulfur-bearing compounds such as hydrogen sulfide and mercaptans.

**Sweetening:** Processes that either remove obnoxious sulfur compounds (primarily hydrogen sulfide, mercaptans, and thiophens) from petroleum fractions or streams, or convert them, as in the case of mercaptans, to odorless disulfides to improve odor, color, and oxidation stability.

### HEALTH

Atmospheric and vacuum distillations are closed processes and exposures are expected to be minimal. When sour (high-sulfur) crudes are processed, there is potential for exposure to hydrogen sulfide in the preheat exchanger and furnace, tower flash zone and overhead system, vacuum furnace and tower, and bottoms exchanger. There is little potential for exposure to crude oil unless a leak or release occurs. Where elevated operating temperatures are used when desalting sour crudes, hydrogen sulfide will be present. There is the possibility of exposure to ammonia, dry chemical demulsifiers, caustics, and/or acids during this operation. Hydrogen chloride may be present in the preheat exchanger, tower top zones, and overheads. Wastewater may contain water-soluble sulfides in high concentrations and other water-soluble compounds such as ammonia, chlorides, phenol, mercaptans, etc., depending upon the crude feedstock and the treatment chemicals. Safe work practices and/or the use of appropriate personal protective equipment may be needed for exposures to chemicals and other hazards such as heat and noise, and during sampling, inspection, maintenance, and turnaround activities.

Crude oils that contain appreciable quantities of hydrogen sulfide or other reactive sulfur compounds are called "sour." Those with less sulfur are called "sweet." Some exceptions to this rule are West Texas crudes, which are always considered "sour" regardless of their H<sub>2</sub>S content, and Arabian high-sulfur crudes, which are not considered "sour" because their sulfur compounds are not highly reactive.

Inhalation, ingestion, and contact with are all methods by which H<sub>2</sub>S can affect the body. The effects may range from irritation of the eyes, nose, and throat; to temporary loss of smell. Headaches, dizziness, and upset stomach are more intense symptoms caused by higher concentrations. However, inhalation of high concentrations of H<sub>2</sub>S may cause instant paralysis of the respiratory system causing loss of consciousness and death. In concentrations of H<sub>2</sub>S at 1000 to 2000 ppm even a single breath may cause coma and may be fatal. Because of its extremely serious and/ or fatal potential, any employee believed to have been exposed to H<sub>2</sub>S shall contact a physician.

The Safety Department of BCI will prepare a site-specific emergency plan for dealing with an H<sub>2</sub>S release where there is a possibility of exposure, and be aware of any site owner's contingency plan provisions. Where working around areas known to have H<sub>2</sub>S, BCI shall employ gas detection by the use of fixed or portable monitors and will alarm when PEL exceeds the preset level of 20 PPM. The emergency plan will include state approved self-contained breathing apparatus or airline respirator with escape SCBA to allow vacating the area when monitor alarm sounds.

### **MEDICAL SURVEILLANCE**

Any employees who are exposed to hazardous concentrations of H<sub>2</sub>S shall have the following medical surveillance performed annually.

- Complete Physical: Initially to detect any pre-existing conditions that could place the employee at a greater risk.
- Eye Disease: H<sub>2</sub>S is a severe eye irritant and may cause tissue damage.
- Some pre-existing eye problems may be at increased risk.
- Chest Roentgenogram (14"x17"): H<sub>2</sub>S may cause lung damage. Initial chest X-rays should be performed with subsequent X-rays chest roentgenograms performed only when indicated.
- C and FEV (1 sec): H<sub>2</sub>S is a respiratory irritant. Employees with impaired pulmonary function may be at increased risk.

### **Permissible Exposure Levels (PEL)**

While not definitive, H<sub>2</sub>S levels below 10 ppm appear to cause little short term effects. When H<sub>2</sub>S level are unknown, respirators shall be used.

#### Current OSHA standards are:

- |        |  |
|--------|--|
| 20 ppm | Ceiling Level  |
| 50 ppm | Maximum allowable peak for 10 minutes with no other exposure |

#### Current NIOSH standards are:

- |        |                                    |
|--------|------------------------------------|
| 10 ppm | PEL averaged over 10 minute period |
| 50 ppm | Area shall be evacuated            |

## **CONTROLS, PPE**

Normal construction activities may cause our employees to be exposed to H<sub>2</sub>S. In most cases natural or forced ventilation will eliminate or keep concentrations below the PEL. In cases where the PEL may be exceeded, or is unknown self-contained breathing apparatus with full faceplate with positive pressure shall be used for workers.

For persons escaping or providing emergency help, a gas mask with proper acidic gas or H<sub>2</sub>S canister filters may be used. It is unlikely, however if liquid H<sub>2</sub>S is encountered, immediately evacuate the area and notify the Safety Department.

## **FIRST AID**

**Eye Exposure:** If liquid H<sub>2</sub>S contacts eyes wash eyes immediately with water, lifting both lids. Contact lenses should not be worn when working with this chemical. If irritation persists seek medical attention.

**Skin Exposure:** If liquid H<sub>2</sub>S contacts skin wash skin immediately with water. If clothing is penetrated, remove and flush skin with water. If irritation persists seek medical attention.

**Breathing:** If a person breathes in a large amount of H<sub>2</sub>S, move the person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible.

**Rescue:** Move the affected person from the hazardous exposure. If the exposed person has been overcome, notify someone else and put into effect the established emergency rescue procedures. Do not become a casualty. Understand the facility's emergency rescue procedures and know the location of rescue equipment before the need arises.

## **Vessels, Tanks:**

Typically our workers do not work in tanks, however note that high concentrations of H<sub>2</sub>S may be present in tanks and vessels around refinery and tank farm areas. For instance, hydrogen sulfide exposure during the gauging operation occurs when the thief hatch is opened. The vapor space in these storage tanks can have vapor phase hydrogen sulfide concentrations up to hundreds of parts per million. Thus employees opening these thief hatches, without appropriate personal protective equipment, can be exposed to life threatening concentrations of hydrogen sulfide gas which is released through the hatch into the employees' breathing zone. The concentration of hydrogen sulfide gas released through the hatch depends on many factors: the concentration of "sour" components in the crude oil; the level of liquid crude oil in the tank; the temperature of the crude oil in the tank, any pressure differential between the vapor space in the tank and the outside atmosphere; the size of the hatch opening; and local environmental conditions (i.e. ambient temperature, wind speed, wind direction, etc.) at the time the gauging is being performed. Therefore, any similar inspection or other work in or around tanks and vessels require air sampling and/ or SCBA use for affected workers.



# LADDER SAFETY PLAN

## PURPOSE

BCI has developed this program to ensure the safety of employees working with ladders. This program is intended to comply with the Occupational Safety and Health Administration (OSHA) Standards contained in 29 CFR 1910.25-26 and 1926.1053.

## SCOPE

This program applies to all BCI personnel who may be expected to use a ladder during the course of work. This program covers the following ladders: step, extension, and other portable ladders. Users must be able to recognize and avoid ladder hazards and be aware of safe practices in setting up, storing, and working with ladders.

## POLICY

All ladders used by employees of BCI for construction, alteration, repair, demolition, and general purposes are covered by this program. **THE USE OF ANY LADDER OTHER THAN THOSE CONSTRUCTED FROM FIBERGLASS IS STRICTLY PROHIBITED!**

## AUTHORITY AND RESPONSIBILITY

BCI Executive Management and the Safety Department are responsible for:

- Ensuring that ladder safety measures are in place according to this program and the applicable OSHA standards;
- Ensuring that workers are trained in ladder safety;
- Maintaining training records;
- Ensuring that ladders meet OSHA regulations; and
- Periodically evaluating program implementation.

Supervisors are responsible for:

- Ensuring that all ladders used at BCI are free from defects and all moving parts are working properly;
- Ensuring that all affected employees using ladders have been trained;
- Ensuring that all affected employees comply with this program;
- Taking ladders out of service if they are defective; and
- Conducting periodic inspections of work areas.

Employees are responsible for:

- Complying with the requirements of this program;
- Attending required training programs;
- Inspecting ladders for defects or possible hazards prior to use;
- Tagging any defective ladder as out of service; and
- Reporting any ladder defects to their supervisor.

## TYPES OF PORTABLE LADDERS

**Stepladder:** Self-supporting portable ladder, non-adjustable in length, having flat steps and a hinged back.

**Single Ladder:** A non-self-supporting portable ladder, nonadjustable in length, consisting of one section.

**Extension Ladder:** A non-self-supporting portable ladder adjustable in length, consisting of multiple sections.

The American National Standards Institute (ANSI) requires that a duty rating sticker be placed on the side of the ladder. When selecting a ladder, be sure to use the proper duty rating to carry the combined weight of the user and material. The ladder duty ratings are as follows:

- Type 1AA (Extra Heavy Duty Industrial): Step ladders - 3-20 feet for heaving duty, such as utilities, contractors, and industrial use. Extension ladders – Maximum of 32’ working length. Load capacity not to exceed 375 pounds.
- Type 1A (Extra Heavy Duty Industrial): 3-20 feet for heaving duty, such as utilities, contractors, and industrial use. Load capacity not to exceed 300 pounds.
- Type I (Industrial): 3-20 feet for heavy duty, such as utilities, contractors, and industrial use. Load capacity not to exceed 250 pounds.
- Type II (Commercial): 3-12 feet for medium duty, such as painters, offices, and light industrial use. Load capacity not to exceed 225 pounds.
- Type III (Household): 3-6 feet for light duty, such as light household use. Load capacity not to exceed 200 pounds.

NOTE: Only Type 1AA and Type 1A ladders shall be used in field operations.

## SELECTION OF LADDERS

Ladders are generally available in three material compositions: wood, fiberglass, and metal.

### Wood Ladders

- Wood Ladders are electrically non-conductive and are the best natural insulator against heat. They can be electrically conductive if wet. Wood ladders are heavier than metal. They are susceptible to drying and rotting and need a clear finish to protect them.

### Fiberglass Ladders

- Fiberglass ladders are strong, lightweight, and electrically non-conductive. They do not dry out and split like wood. They are slow to conduct heat, so they are able to withstand heat exposure without losing strength. They are heavier than wood or metal and are not available in longer extension ladders. Fiberglass may chip or crack under severe impact. When overloaded, fiberglass does not bend, it cracks and fails. **ONLY FIBERGLASS LADDERS MAY BE USED IN SUBSTATIONS AND NEAR ENERGIZED CONDUCTORS.**

### Metal Ladders

- Metal ladders are very strong and lightweight. They dent, but do not chip or crack when subjected to severe impact. They do not require a protective varnish for protection. They do conduct heat rapidly. If they are exposed to heat, they will lose their tensile strength. **They must not be used when working on or near electrical wires or when working around energy sources.** Metal ladders must be labeled with a DANGER warning sticker indicating electrocution hazard.

## LADDER CARE AND MAINTENANCE

Ladders shall be maintained in good condition at all times by ensuring the following:

- The joint between the steps and side rails shall be tight;
- Rungs must be uniformly spaced;
- All hardware and fittings shall be securely attached;
- Movable parts shall operate freely without binding or excessive play;
- Locks, wheels, pulleys, and other bearings shall be frequently lubricated;
- Frayed or badly worn rope shall be replaced;
- Safety feet and other auxiliary equipment shall be kept in good condition;

Ladders shall be visually inspected frequently;

- Ladders with defects shall be taken out of service and tagged as "**Dangerous, Do Not Use.**"
- Ladder repairs must restore the ladder to its original design criteria before the ladder may be returned to use;
- Rungs shall be kept free of grease and oil;
- Metal steps and rungs shall be grooved or roughened to prevent slipping; and
- Wood ladders shall not be painted with an opaque finish or coated with any material that may hide defects. Use only clear varnish.

## LADDER STORAGE

When not in use, ladders shall be stored in a designated location out of direct sunlight and not exposed to harmful elements that may cause decay/damage. Never store materials on a ladder. Straight and extension ladders should be stored in storage racks. Be sure that ladders are secured when in transit. Vibration and bumping against other objects may cause damage.

## LADDER INSPECTION

The user shall inspect the ladder prior to use. Ladders shall be inspected by a department supervisor or designee for visible defects on an annual basis and after any incident that could affect their safe use. The person performing the annual inspection shall complete the BCI Ladder Inspection Checklist. (Attachment 30). The Safety Department shall maintain a record of the inspection report.

If a ladder tips over, immediate inspection of the following is required:

- Inspect for side rail dents or bends or excessively dented rungs;
- Check all rung-to-side-rail connections;
- Check hardware connections; and
- Check rivets for shear.

## LADDER SET-UP

Prior to climbing a ladder, it shall be set up according to the following:

- Position the ladder so that the side rails extend at least 3 feet above the landing;
- Secure the side rails at the top to a rigid support and use a grab device when 3 foot extension is not possible;
- Extension ladders shall be extended from the ground only;
- Make sure the weight on the ladder will not cause it to slip off its support;
- Portable ladders shall be used so that the base is a distance from the vertical wall equal to one-fourth the working length of the ladder;
- The ladder base must be placed with secure footing;

- The ladder shall be placed or held in place to prevent slipping;
- Ladders shall not be used in a horizontal position as a platform, a runway, or scaffold;
- Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked upon, locked, or guarded;
- Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height;
- No ladder shall be used to gain access to a roof unless the top of the ladder extends at least 3 feet above the point of support, at eave, gutter, or roofline;
- The user shall equip all portable rung ladders with non-slip bases or secure the ladder when there is a hazard of slipping;
- The area around the ladders must remain clear from debris, equipment, etc.

The minimum overlap for the two-sections on extension ladders shall be:

<b>Size of Ladder (feet)</b>	<b>Overlap (feet)</b>
Up to and including 36	3
Over 36 up to and including 48	4
Over 48 up to and including 60	5

- Never place a ladder near electrical wiring or against operational piping (chemical, gas, sprinkler systems) where damage may occur;
- When two or more ladders are used to access a work area, they must offset with a landing or platform between the ladders; and
- Always check for stability prior to climbing.

To set up a straight or extension ladder:

- Lay the ladder on the ground with the base resting against the bottom of the wall and the top pointing away from the wall;
- Place extension ladder at a 4:1 ratio: 1' horizontal to every 4' vertical.
- Starting at the top, lift the ladder over your head and walk under the ladder to the wall. Move hands from rung to rung as you go.
- When the ladder is vertical and the top touches the wall, pull the base out so that the distance from the wall is one-fourth the height to the point of support; and
- Reverse the process to remove the ladder.

## **CLIMBING AND STANDING**

When climbing or standing on a ladder, the following safety precautions shall be followed:

- Make sure shoes are free of mud, soil, or anything slippery;
- When ascending or descending, the user must face the ladder;
- Use at least one hand to grasp the ladder when climbing. Maintain at least three points of contact with the ladder (two feet and one hand or two hands and one foot);
- The top rest for portable rung and cleat ladders shall be rigid and have strength to support the load;
- The top two steps of a stepladder shall not be used for standing. The highest working height shall be clearly marked;
- Do not stand on the pail shelf of a stepladder;
- Do not straddle the front and back of a stepladder;
- The bracing on the back legs of step ladders is designed solely for increasing stability and not for climbing;
- Never stand on the top two rungs of a straight or extension ladder;
- Supplies or equipment shall not be hand carried by the worker on the ladder; instead, a rope, block, or pulley system shall be used to move the equipment;
- To help prevent loss of balance, carry small items such as hammers, nails, pliers, etc. in a tool belt;
- When working to the side of a ladder, the centerline of the body must be maintained between the side rails;
- Do not overreach or lean too far to one side;
- No more than one person shall be on a ladder at a time unless the ladder is manufactured to support an additional person;
- Do not move, shift, or extend ladders while in use;
- Never climb onto a ladder from one side;
- Never slide down a ladder;
- Never sit on ladder rails; and
- If you feel sick or dizzy while climbing or standing on a ladder, do not try to climb down in a hurry. Drape your arms around the rungs and rest your head against the ladder until you feel better. Then climb down slowly.

## **SECURING THE LADDER**

Single and extension ladders shall be secured at the top and bottom to prevent movement. To secure the ladder at the bottom, flip the ladder shoes so that the spurs poke the ground. If setting up a ladder on hard surfaces, tie ropes to both ladder legs beneath the lowest rung and tie the other end of the ropes to a solid anchored object at or near the base of the wall. If possible, nail a cleat behind the ladder's feet to prevent the ladder from slipping. To secure the ladder at the top, use roof hooks, tie it to a solid anchor, use rubber or soft plastic "mitts", or use a ladder stabilizer. If the ladder cannot be secured at both the top and bottom, it shall be secured at the base. If this still is not possible, an employee must stand at the base and secure it manually;

- Step ladders shall be opened completely and ensure that the spreader is locked prior to use. Never use a stepladder in an unfolded position;
- Never use ladders on slippery surfaces or on snow or ice unless secured or the ladder is equipped with non-slip or spike feet;
- Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.
- Use On or Near Electrical Equipment

Safety-related work practices shall prevent electric shock or other injuries from electrical contact when work is performed on or near equipment or circuits that are or may be energized. These work practices shall be consistent with the nature and extent of the associated electrical hazards.

**Metallic or metal-type ladders shall NOT be used around electrical energy, components, and sources.**

Portable ladders shall have nonconductive side rails if used where the employee or ladder could contact exposed energized parts. The requirements found in OSHA 29 CFR 1910.333 and 1910.269 shall be followed.

Additional training, such as lockout-tag out and electrical safety training, is required for this application.

## **TRAINING REQUIREMENTS**

All employees shall be trained prior to portable ladder use to recognize hazards and procedures to minimize hazards.

Employees shall be trained in the following:

- The recognition of possible hazards associated with ladder use, maintenance, and safety precautions;
- The proper use and placement of ladders; and
- The maximum intended load capacities of ladders used.
- Employees shall be retrained as necessary to maintain their understanding and knowledge on the safe use of ladders.

# LEAD AWARENESS

## POLICY

BCI will not engage in work which may result in lead exposure in any form. In the event that worker during the course of work is exposed to lead, work will be stopped and abatement of the lead will be contracted out. Work will resume upon completion of the abatement or when the PEL has gone below OSHA standards.

## LEAD AWARENESS

Most lead over-exposures in the construction industry are found in the trades such as plumbing, welding and painting. In building construction, lead is frequently used for roofs, cornices, tank linings and electrical conduits. In plumbing, an alloy of lead/tin had been used extensively for soldering tin-plate and pipe joints. Use of lead solders in plumbing systems is now prohibited by law. Lead-based paint had also been used extensively for residential and commercial applications but has been banned for residential use by the Consumer Product Safety Commission. Lead-based paint may still be used on metal structures (bridges, railways, beams, etc.) to prevent corrosion, although substitute coatings are now available. In other industries, lead may be found in batteries, circuit boards, cathode ray tubes, and leaded glass.

Significant lead exposures can arise during stripping or demolition/ salvage of structures containing lead-based paint. The types of work with the greatest potential for lead exposure include iron work, demolition, painting, plumbing, electrical, lead-based paint abatement, heating/air conditioning and carpentry/renovation activities.

Unless working in a relatively new building (built since 1980), all paint should be treated as lead containing unless sampling shows otherwise.

Disturbance is defined as scraping, washing, limited wet sanding, grinding, welding, drilling, small surface cutting for installation of equipment, repainting activities, cleaning activities, and minor surface modifications.

On Multi-Employer worksites, if our employees who are working immediately adjacent to a lead abatement activity are exposed to lead due to the inadequate containment of such job, BCI shall either remove the employees from the area until the enclosure breach is repaired or perform an initial exposure assessment.

Employees are prohibited from disturbing lead-containing or presumed lead-containing materials. If an employee should accidentally contact such materials, the employees' hands and faces should be washed immediately.

Employees must abide by any signs/labels/assessment reports indicating the presence of lead containing materials. Appropriate work practices should be followed to ensure the lead containing materials are not disturbed.

All employees with potential exposure to lead must receive training.

All affected employees are required to attend initial and annual training programs. The employees should be informed of the specific nature of the operations which could result in exposure to lead above the action level, the purpose, proper selection, fitting, use, and limitation of respirators, engineering controls, purpose & a description of the medical surveillance program & the medical removal program.

## HEALTH HAZARDS

Health effects from lead exposure continue to be a concern both at the workplace and in the home. Since the ban on lead in gasoline, lead levels detected in areas near roadways have decreased dramatically; however, lead based paint used in buildings and housing prior to 1980 continue to serve as significant sources of exposure.

Some common symptoms of acute lead poisoning are loss of appetite, nausea, vomiting, stomach cramps, constipation, difficulty in sleeping, fatigue, moodiness, headache, joint or muscle aches, and anemia. Long term (chronic) overexposure to lead may result in severe damage to the blood-forming, nervous, urinary, and reproductive systems.

Lead poisoning can result from a single high level (acute) exposure or through a number of smaller repetitive (chronic) exposures. Most adults are exposed to lead through occupational sources, while children and infants are exposed primarily through surface dust and soil. Floors, chewable surfaces and soil contaminated with lead serve as primary exposure sources for children.

Lead has no beneficial effect on humans. Once it has been ingested into the body, lead is distributed in the bloodstream to red blood cells, soft tissues and bone. Lead in the body is eliminated very slowly, mainly by the kidneys and digestive tract. Irreversible kidney damage may have already developed by the time high blood lead levels are identified and treated, making avoidance to exposure and medical surveillance extremely important.

Acute lead poisoning symptoms usually include abdominal pain as in a gall bladder attack or appendicitis. Other non-specific complaints include irritability, fatigue, weakness and muscle pain. In rare instances, damage to the brain and central nervous system also may occur. Chronic lead poisoning may result after lead has accumulated over time in the body and has been deposited mostly in the bone.

Stored lead in the bone may be released to the blood stream to produce health effects such as defective hemoglobin synthesis, nervous system abnormalities, hypertension, effects in the reproductive system (including impotency) and damage to a developing fetus.

The measurement of blood lead level is the most reliable method of evaluating lead exposure. It indicates the amount of lead in the bloodstream, which is often a measure of recent exposure to lead. The present "level of concern" in children is ten micrograms of lead per deciliter of blood (10 µg/dl). The level of concern for adult workers, as established by OSHA, is 40 µg/dl.

#### **Ways in which lead enters your body.**

When absorbed into your body in certain doses lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed.

Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.



## Effects of overexposure to lead

- Short term (acute) overexposure.
  - Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardio-respiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.
- Long-term (chronic) overexposure.
  - Chronic overexposure to lead may result in severe damage to your ability to form new blood cells, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain.

Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by:

- vomiting
- a feeling of dullness progressing to drowsiness and stupor
- poor memory
- restlessness
- irritability
- tremor
- convulsions

It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood.

Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately

Anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased oxygen carrying capacity in the blood.

### **Health protection goals of the standard**

Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that worker blood lead (PbB) levels be maintained at or below forty micrograms per one hundred grams of whole blood (40  $\mu\text{g}/100\text{g}$ ). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30  $\mu\text{g}/100\text{g}$  to minimize adverse reproductive health effects to the parents and to the developing fetus.

The measurement of your blood lead level is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels (PbB) are most often reported in units of milligrams (mg) or micrograms ( $\mu\text{g}$ ) of lead (1 mg=1000  $\mu\text{g}$ ) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometime PbB's are expressed in the form of mg% or  $\mu\text{g}\%$ . This is a shorthand notation for 100g, 100 ml, or dl. PbB measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues.

PbB measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between PbBs and various diseases. As a result, your PbB is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

Once your blood lead level climbs above 40  $\mu\text{g}/100\text{g}$ , your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular PbB in a given person will cause a particular effect. Studies have associated fatal encephalopathy with PbBs as low as 150  $\mu\text{g}/100\text{g}$ . Other studies have shown other forms of diseases in some workers with PbBs well below 80  $\mu\text{g}/100\text{g}$ . Your PbB is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated PbBs. The longer you have an elevated PbB, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage.

The best way to prevent all forms of lead-related impairments and diseases-both short term and long term- is to maintain your PbB below 40  $\mu\text{g}/100\text{g}$ . The provisions of the standard are designed with this end in mind. BCI has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his actions.

### **Reporting signs and symptoms of health problems**

You should immediately notify your supervisor or the Safety Department if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead on your ability to have a healthy child. You should also notify your supervisor or the Safety Department if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases BCI must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place.

### **TRAINING**

All BCI employees will be provided with a lead awareness training class.

# NFPA 70E SAFETY PLAN

## PURPOSE

The purpose of this program is to set forth procedures for the safe use of electrical equipment, tools, and to comply with NFPA 70E requirements.

## SCOPE

This program applies to all BCI employees and shall be adhered to when work is being performed at BCI owned facilities and client-owned jobsites. When work is being performed on a client's jobsite and project, BCI shall advise the client of:

- Any unique hazards presented by work we will perform,
- Any unanticipated hazards found during work by BCI that the client did not mention, and
- The measures BCI took to correct any hazards reported by the client to prevent such hazards from recurring in the future.

## RESPONSIBILITIES

Safety Department and Executive Management:

- Develop electrical safety programs and procedures in accordance with OSHA requirements and/or as indicated by events and circumstances.

Project Managers and Jobsite Superintendents:

- Responsible for ensuring that only qualified employees and or qualified contractors perform electrical repairs or installations.
- Unqualified persons shall not be permitted to enter spaces that are required to be accessible to qualified employees only, unless the electric conductors and equipment involved are in an electrically safe work condition.

Project Managers and Jobsite Superintendents:

- Ensure a documented Job Hazard Analysis (JHA) (Attachments 9) is held before starting each job and will include all employees involved.
- The JHA will cover hazards associated with the job, work procedures involved, special precautions, energy source controls and PPE requirements.
- All applicable electrical safety programs are implemented and maintained at their locations.

Employees:

- Use electrical equipment, tools, and appliances according to this program
- Attending required training sessions when directed to do so and to report unsafe conditions to their supervisor immediately.
- Only qualified employees may work on electric circuit parts or equipment that has not been de-energized. Such employees shall be made familiar with the use of special precautionary techniques, PPE, insulating and shielding materials and insulated tools.

## **SAFE WORK PRACTICES**

Prior to any work being done within the Limited Approach Boundary a hazard risk analysis shall be performed. The analysis shall contain event severity, frequency, probability and avoidance to determine the level of safe practices employed. A job briefing will be conducted prior to work beginning. The briefing will address the hazard risk analysis, work to be performed, specific work processes and other matter specific to the tasks to be completed.

### **SAFE WORK PRACTICES FOR WORKING WITHIN THE LIMITED APPROACH BOUNDARY**

The limited approach boundary is the distance from an exposed live part within which a shock hazard exists. Only qualified persons shall complete tasks such as testing, troubleshooting and voltage measuring within the limited approach boundary.

The restricted approach boundary is the closest distance to exposed live parts a qualified person can approach with without proper PPE and tools. Inside this boundary, accidental movement can put a part of the body or conductive tools in contact with live parts or inside the prohibited approach boundary. To cross the restricted approach boundary, the qualified person must:

- Have an energized work permit that is approved by the Jobsite Superintendent or Project Manager responsible for the safety plan.
- Use PPE suitable for working near exposed lived parts and rated for the voltage and energy level involved.
- Be certain that no part of the body enters the prohibited space.
- Minimize the risk from unintended movement, by keeping as much of the body as possible out of the restricted space; body parts in the restricted space should be protected.

The prohibited approach boundary is the minimum approach distance to exposed live parts to prevent flashover or arcing. Approaching any closer is comparable to making direct contact with a live part. To cross the prohibited approach boundary, the qualified person must:

- Have specified training to work on exposed live parts.
- Have a permit with proper written work procedures and justifying the need to work that close.
- Do a risk analysis.
- Use PPE appropriate for working near exposed live parts and rated for the voltage and energy level involved.
- The Flash Protection Boundary is the approach limit at a distance from exposed live parts within which a person could receive a second degree burn if an electrical arc flash were to occur.
- Use PPE appropriate for working near exposed live parts and rated for the voltage and energy level involved.

For systems of 600 volts and less, the flash protection boundary is 4 feet, based on an available bolted fault current of 50 kA and a clearing time of 6 cycles for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles.

When working on de-energized parts and inside the flash protection boundary for nearby live exposed parts. If the parts cannot be de-energized, use barriers such as insulated blankets to protect against accidental contact or wear proper PPE.

### **ARC FLASH HAZARD ANALYSIS**

An arc flash hazard analysis includes the following:

- Collect data on the facility's power distribution system.
- Arrangement of components on a one-line drawing with nameplate specifications of every device.
- Lengths and cross-section area of all cables.
- Contact the electric utility for information including the minimum and maximum fault currents that can be expected at the entrance to the facility.
- Conduct a short circuit analysis followed by a coordination study is performed. Feed the resultant data into the NFPA 70E equations.
- These equations produce the necessary flash protection boundary distances and incident energy to determine the minimum PPE requirement.
- The flash protection boundary is the distance at which PPE is needed to prevent incurable burns (2nd degree or

worse) if an arc flash occurs. (It is still possible to suffer 1st or 2nd degree burns.)

- For systems of 600 volts and less, the flash protection boundary is 4 feet, based on an available bolted fault current of 50 kA (kilo amps) and a clearing time of 6 cycles (0.1 seconds) for the circuit breaker to act, or any combination of fault currents and clearing times not exceeding 300 kA cycles (5000 ampere seconds).
- When working on de-energized the parts, but still inside the flash protection boundary for nearby live exposed parts:
  - If the parts cannot be de-energized, barriers such as insulated blankets must be used to protect against accidental contact or PPE must be worn.
  - Employees shall not reach blindly into areas that might contain exposed live parts.
  - Employees shall not enter spaces containing live parts unless illumination is provided that allows the work to be performed safely.
  - Conductive articles of jewelry and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear, or metal frame glasses) shall not be worn where they present an electrical contact hazard with exposed live parts.
  - Conductive materials, tools, and equipment that are in contact with any part of an employee's body shall be handled in a manner that prevents accidental contact with live parts. Such materials and equipment include, but are not limited to long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal-lined rules and scales, steel tapes, pulling lines, metal scaffold parts, structural members, and chains.
  - When an employee works in a confined space or enclosed spaces (such as a manhole or vault) that contains exposed live parts, the employee shall use protective shields, barriers or insulating materials as necessary to avoid contact with these parts. Doors, hinged panels, and the like shall be secured to prevent them from swinging into employees.

## **INSPECTIONS**

- Electrical equipment, tools, and appliances must be inspected prior to each use.
- The use of a hard fixed GFCI or a portable GFCI adapter shall be used with all portable hand tools, electric extension cords, drop lights and all 110 volt equipment
- Faulty equipment, tools, or appliances shall be removed from service immediately and tagged "Out of Service", dated and signed by the employee applying the tag.

## **EQUIPMENT**

- Test instruments, equipment, and their accessories shall meet the requirements of ANSI/ISA-61010-1-Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use Part 1 General Requirements, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 Volts and below.
- When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument shall be verified before and after an absence of voltage test is performed.

## **Personal Protective Equipment**

- All insulating PPE must be inspected before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves shall be given an air test, along with the inspection.
- Maximum test intervals for rubber insulating personal protective equipment shall include: Blankets-before first issue/every 12 months thereafter
  - Gloves-before first issue and every 6 months
  - Sleeves before first issue and every 12 months
  - Covers and line hose shall be testing if insulating value is suspect.

## **Energized Electrical Work Permit**

- Work on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition shall be considered energized electrical work and shall be performed by written permit only.

## **LIGHTING**

- Employees shall not enter spaces containing electrical hazards unless illumination is provided that enables the employees to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed employees shall not perform any task within the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

## **EXTENSION CORDS**

- Use only three-wire, grounded, extension cords and cables that conform to a hard service rating of 14 amperes or higher, and grounding of the tools or equipment being supplied.
- Only commercial or industrial rated-grounded extension cords may be used in shops and outdoors.
- Cords for use other than indoor appliances must have a rating of at least 14 amps.
- Cords must have suitable strain relief provisions at both the plug the receptacle ends.
- Work lamps (drop light) used to power electrical tools must have a 3 wire, grounded outlet, unless powering insulated tools.
- Adapters that allow three-wire, grounded prongs, connected to two wire non-grounded outlets are strictly prohibited.
- Cords must have a service rating for hard or extra-hard service and have S, AJ, ST, SO, SJO, SJT, STO, or SJTO printed on the cord.
- Cords may not be run through doorways, under mats or carpets, across walkways or aisles, concealed behind walls, ceilings or floors, or run through holes in walls, or anywhere where they can become a tripping hazard.
- High current equipment or appliances should be plugged directly into a wall outlet whenever possible.
- All extension cords shall be plugged into one of the following:
  - A GFCI outlet;
  - A GFCI built into the cord;
  - A GFCI adapter used between the wall outlet and cord plug.
- All extension cords and or electrical cords shall be inspected daily or before each use, for breaks, plug condition and ground lugs, possible internal breaks, and any other damage. If damage is found, the extension cord or electrical cord shall be remove from service and repaired or replaced.

## **Outlets**

Outlets connected to circuits with different voltages must use a design such that the attachment plugs on the circuits are not interchangeable.

- **Multiple Outlet Boxes**
  - Multiple outlet boxes must be plugged into a wall receptacle.
  - Multiple outlet boxes must not be used to provide power to microwave ovens, toasters, space heaters, hot plates, coffeepots, or other high-current loads.
- **Double Insulated Tools**
  - Double insulated tools must have the factory label intact indicating the tool has been approved to be used without a three wire grounded supply cord connection.
  - Double insulated tools must not be altered in any way, which would negate the factory rating.

- **Switches, Circuit Breakers, and Disconnects**

- All electrical equipment and tools must have an on and off switch and may not be turned on or off by plugging or unplugging the supply cord at the power outlet.
- Circuit breaker panel boxes and disconnects must be labeled with the voltage rating.
- Each breaker within a breaker panel must be labeled for the service it provides.
- Disconnect switches providing power for individual equipment must be labeled accordingly.

### **Ladders**

- Only approved, non-conductive ladders, may be used when working near or with electrical equipment, which includes changing light bulbs.
- Ladders must be either constructed of wood, fiberglass, or have non-conductive side rails.
- Wood ladders should not be painted, which can hide defects, except with clear lacquer.
- When using ladders they shall be free from any moisture, oils, and greases.

### **Energized and Overhead High Voltage Power Lines & Equipment**

- A minimum clearance of 10 feet from high voltage lines must be maintained when operating vehicular and mechanical equipment such as forklifts, cranes, winch trucks, and other similar equipment.
- When possible, power lines shall be de-energized and grounded or other protective measures shall be provided before work is started.
- Minimum approach distance to energized high power voltages lines for unqualified employees is 10 feet.
- Minimum approach distance for qualified employees shall be followed per 29 CFR 1910.333(c)(3)(i) Qualified–Table S5 Selection and Use of Work Practices - Approach Distances for Qualified Employees – Alternating Current (Attachment 17)

### **Confined or Enclosed Work Spaces**

- When an employee works in a confined or enclosed space that contains exposed energized parts, the employee shall isolate the energy source and turn off the source and lock and tag out the energy source (Only qualified electricians can work on an exposed energy source).
- Protective shields, protective barriers or insulating materials as necessary shall be provided.
- Enclosures, Breaker Panels, and Distribution Rooms
- A clear working space must be maintained in the front, back and on each side of all electrical enclosures and around electrical equipment for a safe operation and to permit access for maintenance and alteration.
- A minimum two-foot working floor space in front of panels and enclosures shall be painted yellow.
- Employees may not enter spaces containing exposed energized parts unless illumination is provided that enables the employees to work safely.
- Housekeeping in distribution rooms must receive high priority to provide a safe working and walking area in front of panels and to keep combustible materials to the minimum required to perform maintenance operations.
- All enclosures and distribution rooms must have “Danger: High Voltage – Authorized Personnel Only” posted on the front panel and on entrance doors.
- Flammable materials are strictly prohibited inside distribution rooms (Boxes, rags, cleaning fluids, etc.)

### **Lock Out/Tag Out**

- No work shall be performed on (or near enough to them for employees to be exposed due to the dangers of tools or other equipment coming into contact with the live parts) live parts and the hazards they present.
- If any employee is exposed to contact with parts of fixed electric equipment or circuits which have been de-energized, the circuits energizing the parts shall be locked out or tagged or both.
- Conductors and parts of electrical equipment that have been de-energized but not been locked or tagged out shall be treated as live parts.

- Per BCI policy, any work on energized circuits that is to be outsourced will be performed only by qualified and licensed electrical contractors who are familiar with the use of special precautionary techniques, PPE, insulating and shielding materials and insulated tools. Any equipment being made ready for maintenance will be locked out using the facility owner's or BCI's Lock Out/Tag Out Program (Attachments 22, 23 & 24). Lockouts are performed by the Project Manager, Jobsite Superintendent or an authorized representative of the facility owner. If live sources are to be worked it will only be performed with the knowledge of jobsite management. Only certified electricians may work on electric circuit parts or equipment.
- Only authorized personnel may perform lock out/tag out work on electrical equipment and will follow BCI's Lockout/TagOut Program.
- Authorized personnel will be trained in lockout/tag out procedures.
- Affected personnel will be notified when lockout/tag out activities are being performed in their work area.

#### **Contractors**

- Only approved, certified, electrical contractors may perform construction and service work on BCI or client property.
- It is the responsibility of Management/Supervisors to verify the contractor's certification.

#### **Fire Extinguishers**

- Approved fire extinguishers must be provided near electrical breaker panels and distribution centers.
- Water type extinguishers shall not be located closer than 50 feet from electrical equipment.

#### **Electric Shock-CPR**

- If someone is discovered that has received an electric shock and is unconscious, first check to see if their body is in contact with an electrical circuit. Do not touch a person until you are sure there is no contact with an electrical circuit.
- When it is safe to make contact with the victim, begin CPR if the person's heart has stopped or they are not breathing.
- Call for help immediately.

#### **Electric Welders**

- A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.
- A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means may not be less than the supply conductor ampere capacity.

#### **Equipment Grounding**

- All gas compressors, air compressors, separators, vessels, etc. shall be grounded by means of using a lug and ground strap, nominal in size to a ½" bolt or larger, attached to a ground rod six feet or longer.
- Equipment bonding jumpers shall be of copper or other corrosion-resistance material.
- The transfer of hazardous or flammable material from a metal or plastic container with a flash point of 100 degrees F or less shall have a ground strap from the container and attached to the skid or a ground rod placed in the ground.



## **TRAINING**

Employees are trained to understand the specific hazards associated with electrical energy. Employees shall be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with their respective jobs. Employees shall be trained to identify and understand the relationship between electrical hazards and possible injury.

Employees shall be trained in the skills and techniques to distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment, to determine the nominal voltage of exposed energized electrical conductors and circuit parts, the approach distances specified in Table 130.2 (below), and the decision making process necessary to determine the degree and extent of the hazard and the personal protective equipment and job planning necessary to perform the task safely.

Employees shall be trained in safety related work practices that pertain to their respective job assignments. Safe work practices shall be employed to prevent electric shock or other injuries resulting for either direct or indirect electrical contacts when work is performed near or on equipment or circuits which are or may be energized.

## **RETRAINING**

Retraining will be given to employees who are not complying with safety-related work practices and rules or when work practices are different than those the employee was previously trained for. In addition, retraining shall be conducted at an interval of not more than 3 years from previous training.

Training shall be documented and maintained for the duration of the employee's employment. Documentation shall be made when the employee demonstrates proficiency, be maintained for the duration of the employee's employment and contain each employee's name and date of training.

# RESPIRATORY PROTECTION PLAN/PROGRAM

## **POLICY**

BCI will not engage in work which may result in the required use or need for Respiratory Protection Program in any form. In the event that worker during the course of work is required to seek respiratory protection, work will be stopped and proper respiratory protection will be identified in the plan that follows will be enforced as a Program. It is management's responsibility to implement this program at no cost to the employees and it is the employee's responsibility to comply with all aspects of this program. Any voluntary use of respiratory protection equipment by employees shall be governed by the provisions of this program, also at no expense to the employees.

## **PURPOSE**

The purpose of this policy is to establish a respiratory protection program that ensures that workers are provided with the necessary information, training, and equipment to protect themselves from respiratory hazards in the workplace, and complies with OSHA, ANSI and other applicable standards and regulations.

## **RESPONSIBILITIES**

**Management** - Has the responsibility of overseeing the implementation of this policy and assigning program administrators for each site location. These administrators must be suitably trained and have the appropriate accountability and responsibility to fully manage the site respiratory program. The program administrator will report, at least annually, on the effectiveness of the program to management, and be authorized to make appropriate changes to the site program. The administrators will be identified by name in the specific site program.

**Supervisory** - It is the responsibility of the supervisor to ensure that all personnel under their control are completely knowledgeable of the respiratory requirements of this program. Supervisors are to ensure that employees have been trained and are medically fit to use respiratory equipment safely. It is the supervisors' duty to monitor the employees' diligence in following procedure and take appropriate action when deficiencies are observed.

**Employees** - It is the responsibility of the employee to be aware of and practice the information presented in the training. Specifically, employee responsibilities are to report equipment malfunctions, seal check their respirator before every use, and to report medical or physical changes that could affect respirator use.

## **HAZARD ASSESSMENT**

Respiratory hazard determination starts at the planning stage of a job. The responsible party is to identify all known hazards as required by the hazard communication standard. Evaluation of the hazards consists of exposure duration, potential for contact, and known or potential concentrations. When the hazard is a federally controlled substance, that hazard shall be assessed and monitored as dictated by that specific standard. A respiratory hazard may not have an established OSHA permissible exposure limit documented; however, all provisions of this program will be enforced to protect the health of the employees.

Acceptable methods for estimating respiratory hazards include:

- Personal exposure monitoring is the most reliable and accurate method to determine exposure.
- Use of objective data – This is the use of data obtained from industry studies, trade associations or from tests conducted by chemical manufacturers. The objective data shall represent the highest contaminant exposures likely to occur under reasonably foreseeable conditions of processing, use or handling. If objective data is used for assessment, the data must be documented as part of the written program.
- Mathematical Approach – The use of physical and chemical properties of air contaminants, combined with information on room dimensions, air exchange rates, contaminant release rates, and other pertinent data including exposure patterns and work practices to estimate maximum exposure levels in the work place.
- Where employee exposure cannot be identified or reasonably estimated, the atmosphere will be considered immediately dangerous to life and health (IDLH). Also atmospheres that are oxygen deficient will be treated as IDLH conditions.
- Accidental release or emergency response must be a consideration when estimating hazard exposure.

## **HAZARD CONTROL**

### **Engineering Controls:**

- This should be the first consideration when evaluating hazard exposure.
- Substitution of a less or non-toxic substance to replace a more harmful one.
- Isolation or encapsulation of the process. Example: To spray asbestos insulation with glue paste to lessen exposure levels.
- Ventilation to remove contamination from the work area before exposure. Example: Mechanical dust collection system installed to capture contaminants and reduce buildup.

### **Administrative Controls:**

- Especially effective for repetitive stress and heat stress control, crew rotation could increase productivity in contaminated atmospheres.
- Adjust the length of the work shift. Instead of two 12 hour shifts, it may be more effective to have three 8 hour shifts.
- Change scheduled work to limit the number of employees exposed. The scheduling of other work near the exposure area could be limited until exposure is gone.

### **Personal Protective Devices:**

Personal protective devices for the control of respiratory hazards are to be used as a last resort, and only when other means of control are not practical or feasible. Respiratory protection may be required while implementing engineering controls, or in conjunction with other control methods. Engineering controls may only lessen the exposure, but required to be implemented along with personal protective devices.

### **Respirator Selection**

Selecting the proper respirator can be very complex and is critical in having an effective respiratory program. The program administrator must solicit information from all available professional resources concerning exposure controls.

Factors that must be considered include:

- The nature of the hazardous operation or process
- The type of respiratory hazard (including physical properties, oxygen deficiency, physiological effects on the body, concentration of toxic material or airborne radioactivity level, established exposure limits for the toxic materials, established permissible airborne concentration for radioactive material, and established immediately dangerous to life or health concentration for toxic material)
- The location of the hazardous area in relation to the nearest area having respirable air
- The period of time for which respiratory protection must be worn
- The activities of workers in the hazardous area

- The physical characteristics and functional capabilities and limitations of the various types of respirators

Respirator-assigned protection factors listed (Attachment 35), Respirators for use under IDLH conditions:

- The required respiratory protection for IDLH conditions caused by the presence of toxic materials, or a reduced percentage of oxygen, is a combination full face piece pressure demand supplied air respirator (SAR) with auxiliary self-contained air supply. For rescue applications, a full face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes is acceptable.
- When respirators are worn under IDLH conditions, at least one standby person shall be present in a safe area. The standby person shall have the proper equipment available to assist the respirator wearer in case of difficulty. Communications (visual, voice, signal line, radio, or other suitable means) shall be maintained between the standby person and the wearer. While working in the IDLH atmosphere, the wearer shall be equipped with safety harness and safety lines to permit removal to a safe area, if necessary. Provisions for rescue other than safety harness and lines may be used, if equivalent.

### **Breathing Air Quality**

Workers using supplied breathing air equipment shall be thoroughly trained in its use.

Breathing air is typically supplied from cylinders or via a compressor. Appropriate measures shall be taken to ensure that all compressed breathing air meets at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

- Oxygen content (v/v) of 19.5-23.5%;
- Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
- Carbon monoxide (CO) content of 10 ppm or less;
- Carbon dioxide content of 1,000 ppm or less; and
- Lack of noticeable odor.

Suppliers of breathing air cylinders shall provide the company with a certificate of analysis with each delivery certifying that the breathing air meets the requirements for Grade D breathing air; and that the moisture content in the cylinder does not exceed a dew point of -50 deg.F (-45.6 deg.C) at 1 atmosphere pressure. The certificate shall have the name of the breathing air supplier, the testing technician and date of test.

Breathing air cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178).

### **Breathing Air Compressors**

Compressors used to supply breathing air to respirators shall be constructed and situated so as to:

- Prevent entry of contaminated air into the air-supply system;
- Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (-5.56 deg.C) below the ambient temperature;
- If required to ensure delivery of Grade D air to the user, provide suitable in-line air-purifying sorbent beds and filters.
- All filters, cartridges and canisters shall be labeled and color coded with the NIOSH approval label and the label shall remain legible.
- Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.
- A tag containing the most recent change date and the signature of the person authorized by the employer to perform the change shall be attached to the equipment.
- For compressors that are not oil-lubricated, the company shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.
- For oil-lubricated compressors, the company shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.

- The air shall be routinely tested to ensure that it meets Grade D requirements.
- In addition, a stand-by attendant shall be on watch anytime workers are using breathing air supplied directly by a compressor.
- Breathing air couplings shall be incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing airlines.

## **TRAINING**

To protect employees from exposure to respiratory hazards using OSHA and ANSI standards as minimum guidelines, all employees who will wear respiratory protection will be trained on this policy. Training will be provided prior to job assignment where respirator equipment is required, and annually thereafter. Additional training is required when there are deficiencies in the employee's knowledge/skills or when there is a change in the work place or respiratory equipment that renders previous training obsolete. The training will include the following:

- Responsibilities of employees and supervisors
- How, why and for what jobs we use respirators
  - The nature, extent and effects of respiratory hazards
  - Consequences of improper fit, usage and maintenance on respirator effectiveness
- Hazard assessment including limitations of respirators
  - Air purifying respirators that filter either particles, or absorbing vapors and gases
  - Air supplying respirators that supply air from an uncontaminated source
  - Limitations of respirators in IDLH atmospheres and for emergency use only
- Hazard control
- Respirator selection
- Medical evaluation
- Respirator fit test
- Maintenance, care and storage
  - What to do if respirators have defects
  - Who to report problems to during use
  - Proper technique for donning and removing the respirator, and how to store when not in use
  - How to seal check using the positive and/or negative pressure method
  - Visual inspection of parts for worn or defective items
  - How to keep the issued respirator clean and sanitary
  - Requirement to disinfect and sanitize before reissue to other employees
  - Proper storage in a cool, clean and dry location, placing them in a clean, sealed plastic bag after drying
- Medical surveillance
  - An awareness of physical conditions that may indicate warning signs
  - An obligation to report signs and symptoms and the opportunity for medical reevaluation
  - Changes in weight (gain or loss)
  - Physical changes in facial structure
  - Changes in endurance, stability or general health
  - Medication for illness
- Program evaluation

All training shall be conducted in a way that is understandable to the employee, and is documented.

## **MEDICAL EVALUATION**

- All employees whose job classification may require use of respiratory protection shall be evaluated and certified by a physician or a licensed health care professional (PLHCP) as being “medically fit” to wear a respirator. For new hires, the medical evaluation shall be made before any use of respiratory equipment. Thereafter, the evaluation shall occur at a minimum annually. The medical evaluation consists of, at a minimum, the administration of a health questionnaire meeting federal guidelines or provisions for a physical examination by a PLHCP that elicits the same information as the questionnaire. The PLHCP shall be provided with supplemental information by the employer on the description of the job classification, possible work conditions and any additional PPE that may be required of the employee while using respiratory equipment. Also a copy of this program will be given to the PLHCP for reference along with the OSHA standard.
- The administration of the health questionnaire will be done during work hours and at no cost to the employee. The information on the questionnaire shall remain confidential between the PLHCP and the employee. The employee must have access to the PLHCP for discussion and asking questions concerning their medical evaluation. The company will only receive a recommendation of the employee’s ability to wear respiratory equipment.
- If an employee is restricted by the PLHCP from wearing a negative pressure respirator, but otherwise physically able to perform duties with a powered air respirator, then reasonable accommodations will be made by the program administrator not to have this restriction limit the employee’s ability to perform his job.

## **RESPIRATOR FIT TEST**

- Respirator fit testing is required of all employees prior to using a positive or negative tight fitting respirator. The fit test will be specific for respirator manufacturer, model and size. This test is to be repeated annually, or if there is a change in the respiratory equipment. Some substance specific standards may call for more frequent testing and dictate a specific protocol, which would take precedence over this program. A change in the employee’s physical appearance can affect the seal of a respirator and may require re-testing. If the respirator is unacceptable to the employee due to comfort, irritation, or inability to get a seal, the employee will be offered a reasonable selection for an alternate choice of respirators.
- The employee will be asked to wear the proposed respirator for a period of time to become familiar with the feel and fit. No obstacles can be between their face and the sealing surface of the respirator, including facial hair of 24 hours or more growth, side burns that extend into the sealing surface or hair that is long enough to prevent proper function of the respirator. Jewelry, caps, hats, scarves and certain safety gear must be evaluated as part of the fit test if the employee is permitted or required to wear them during work. OSHA did not restrict the use of contact lens with respirators, but did mandate that the use of corrective lens shall not interfere with the seal of the respirator. Any adaptive devices for vision correction with respiratory equipment will be supplied at no cost to the employee. The employee will be instructed on how to field check respiratory equipment. The positive and negative seal check methods of verifying a good seal shall be required before each and every entry into a respiratory hazard area. These seal checks are not to be considered a fit test.
  - Positive Seal Check
    - A positive seal check is accomplished by effectively sealing the exhalation valve and slowly exhaling. This should create a slight, positive pressure inside the face piece for a short period of time. The participant must be careful not to exhale too fast or small leaks can be nullified and/or large leaks artificially created.
  - Negative Seal Check
    - A negative seal check is accomplished by effectively sealing the inhalation ports of the respirator and inhaling slowly. The participant should be able to create a negative pressure inside the respirator and hold it for a short period of time. Inhaling too fast may nullify small leaks and/or artificially create other leaks.

- Fit Test
  - Qualitative fit test – a pass/fail test that relies on the subject to detect a challenge agent and is predicated on an individual’s sensory response.
  - Quantitative fit test – uses an instrument to measure the challenge agent inside the respirator and gives a numerical value to the test data.
  - If the qualitative testing is used, the employee should be informed of the exposure limitations. A limit of 10 times the permissible exposure level for an 8-hour duration is the maximum exposure for either a half mask, or full face piece negative pressure respirator.
  - For OSHA guidelines, refer to Attachment XXX
  - Irritant smoke protocol for qualitative fit testing is very effective, since it is the only challenge agent that does not rely on a voluntary response. This type of test requires that the tester be well trained in the correct and safe use of the irritant smoke tubes. The smoke tubes can be a health hazard if not used properly and in a well-ventilated room.

## **MAINTENANCE AND CARE**

The company will provide for the cleaning and disinfecting, storage, inspection and repair of respirators that are issued to their employees. There are specific guidelines to follow in Attachment IV to ensure the respirators are clean and disinfected. Respirators designated for the exclusive use of an employee shall be the responsibility of that employee to maintain and keep in a sanitary condition. Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals. Respirators maintained for emergency, training, or fit testing use shall be cleaned and disinfected after every use.

- Storage
  - Respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture and damaging chemicals. They shall be packed or stored to prevent deformation of the face piece. Emergency respirators shall, in addition, be kept accessible to the work area and stored in easily identifiable coverings. Reference manufacturer’s instructions for other recommendations.
- Inspection
  - Respirators are inspected on a regular basis and employees are instructed on how to inspect their respirator. All respirators used on a routine basis shall be inspected before each use and during cleaning. All emergency respirators shall also be inspected at least on a monthly basis. Respirator inspection shall include:
    - tightness of connections
    - condition of various parts including but not limited to:
      - face piece
      - head straps
      - valves
      - gaskets
      - connecting tubes
      - cartridges
      - canisters
      - filters.

Also, check all elastic parts for deterioration and pliability. Inspection of self-contained breathing apparatus shall be done only by trained technicians competent with that specific brand, make and model of respiratory equipment. The technician conducting the inspection shall certify the inspection by attaching a signed and dated tag or label to the equipment.

- Repairs

- Equipment that is defective, broken or otherwise in need of repair shall be identified immediately by attaching a red tag and stating the reason it is out of service. Repairs to respirator equipment shall be made by competent employees and only with the manufacturers' recommended replacement parts. Absolutely no substitution of parts is allowed that is not authorized by the NIOSH approval.

## **MEDICAL SURVEILLANCE**

Employees should be aware of medical conditions that would prevent or limit their use of respiratory equipment. Supervisors shall be informed when employees experience medical difficulties that may affect or be a result of respirator use. Substance specific hazards may require a specific medical monitoring procedure that requires biological testing. Employees will be required to complete a medical questionnaire initially, and then further evaluation at the frequency determined by the medical evaluator.

### **Program Evaluation**

The supervisor will monitor the work site for acceptance of and compliance with the written respiratory program. The supervisor will address issues where employees have had deficient respiratory issues, i.e. cartridge breakthrough and the respirator effectiveness. Employees will be asked questions about the effectiveness of the program and encouraged to offer suggestions for improvement including how the fit test protocol was performed, the maintenance procedures for care and storage of respirators and overall program. Periodic audits will be documented and reviewed by the program administrator. The program administrator will report, at least annually, to the management on the effectiveness of the total program.

### **Fit Testing**

If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the face piece several times and to adjust the straps to become adept at setting the proper tension on the straps.

Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

- Position of the mask on the nose
- Room for eye protection
- Room to talk
- Position of mask on face and cheeks

The following criteria shall be used to help determine the adequacy of the respirator fit:

- Chin properly placed
- Adequate strap tension, not overly tightened
- Fit across Nose Bridge
- Respirator of proper size to span distance from nose to chin
- Tendency of respirator to slip
- Self-observation in mirror to evaluate fit and respirator position

The test subject shall conduct a user seal check, utilizing the negative and positive pressure seal check methods. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to side and up and down slowly while taking in a few slow deep breaths. Another face piece shall be selected and retested if the test subject fails the user seal check tests.

The test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel, which interferes with a satisfactory fit, shall be altered or removed.

If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.



Exercise regimen: Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercise that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test

The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use, which could interfere with respirator fit.

### **Test Exercises**

The test subject shall perform exercises, in the test environment, in the following manner:

- **Normal breathing:** In a normal standing position, without talking, the subject shall breathe normally.
- **Deep breathing:** In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
- **Turning head side to side:** Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
- **Moving head up and down:** Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
- **Talking:** The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

### **Rainbow Passage**

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a person looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

- **Bending over:** The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments that do not permit bending over at the waist.
- **Normal breathing:** Same as exercise above

Each test exercise shall be performed for one minute. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

### **Irritant Smoke Protocol**

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

### **General Requirements and Precautions**

- The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
- Only stannic chloride smoke tubes shall be used for this protocol.
- No form of test enclosure or hood for the test subject shall be used.
- The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.
- The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test, or the build-up of irritant smoke in the general atmosphere.

### **Sensitivity Screening Check**

- The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
- The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.
- The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties, and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

### **Irritant Smoke Fit Test Procedure**

- The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).
- The test subject shall be instructed to keep his/her eyes closed.
- The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the face piece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
- If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.
- The exercises identified in section H of this attachment shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches.
- If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.
- Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
- If a response is produced during this second sensitivity check, then the fit test is passed.

### **Respirator Cleaning Procedures**

- These procedures are provided as a guideline when cleaning respirators. They are general in nature, and the administrator as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth (i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user).
- Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- Wash components in warm water (110° F maximum), with mild detergent or cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- Rinse components thoroughly in clean, warm (110° F maximum), preferably running water.
- Drain.

- When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
- Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110° F, or,
- Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100cc of 45% alcohol) to one liter of water at 110°F, or,
- Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- Rinse components thoroughly in clean, warm (110° F maximum), preferably running water.
- Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- Components should be hand-dried with a clean lint-free cloth or air-dried.
- Reassemble face piece, replacing filters, cartridges, and canisters where necessary.
- Test the respirator to ensure that all components work properly.

## **Site Specific Respiratory Protection Plan**

### **Purpose**

Because site facilities, equipment and procedures are not standard, OSHA requires that each worksite develop and maintain a Site Specific Respiratory Protection Plan. The Site Respiratory Protection Program Administrator will utilize the Respiratory Protection Program with specific procedures governing the administration, selection, use, and care of respirators.

### **Scope and Application**

This procedure applies to all sites or projects where employees are required to wear respirators during normal work operations and during certain non-routine or emergency operations.

### **Site Respirator Program Administrator**

Administrators are responsible for ensuring that the respiratory protection program is implemented at their site. In addition all site supervisors shall be knowledgeable about the program requirements for their own protection, supervisors must ensure that the program is understood and followed by the employees under they supervise. Duties include:

#### **Administrator/Supervisor**

- Ensuring that employees under their supervision (including new hires) have received appropriate and current training, fit testing, and medical evaluation.
- Ensuring the availability of appropriate respirators and accessories.
- Being aware of tasks requiring the use of respiratory protection.
- Enforcing the proper use of respiratory protection when necessary.
- Ensuring that respirators are properly cleaned, maintained, and stored according to the site respiratory protection plan.
- Ensuring that respirators fit well and do not cause discomfort.
- Identifying work areas, processes or tasks that require workers to wear respirators, and evaluating hazards.
- Monitoring respirator use to ensure that respirators are used in accordance with their certifications.
- Ensuring proper storage and maintenance of site respiratory protection equipment.
- Conducting qualitative/quantitative fit testing.
- Updating the Site Program as necessary to reflect workplace changes that affect respirator use.
- Coordinating with management on how to address respiratory hazards or other concerns regarding the Site Program.

## **Employees**

- Each employee has the responsibility to wear his or her respirator when and where required and in the manner in which they were trained. Employees must also:
- Care for and maintain their respirators as instructed and store them in a clean and sanitary location.
- Inform their supervisor if the respirator no longer fits well and request a new one that fits properly.
- Inform their supervisor or the Program Administrator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns that they have regarding the program.
- Notify their supervisor or the Program Administrator of any other problems associated with using their respirator.

## **Hazard Determination/Respirator Selection**

- The Administrator shall utilize Attachments 35 & 36 to ensure that the respirator selected will be adequate to effectively reduce exposure to the respirator user under all conditions of use including reasonably foreseeable emergency situations.

## **Site Hazard Evaluation Update**

- The Administrator is responsible to revise and update the hazard evaluation as needed (i.e., any time work process changes may potentially affect employee exposure). If an employee feels that respiratory protection is needed during a particular activity, she/he is to notify their immediate supervisor.

## **Assigned Protection Factors**

- The Administrator will determine the type of respirator to be selected for non-routine or reasonably foreseeable emergency situations.

## **Medical Evaluation**

- The Administrator will insure that the Medical Evaluation requirements of this policy is followed.

## **Fit Testing**

- Respirator Fit Testing will be conducted as required in the Respiratory Protection Program.

## **Procedures for Immediately Dangerous to Life and Health (IDLH) Situations**

- All employees are prohibited from entering and working in known IDLH areas, unless they are specifically trained and certified for such work i.e. inert entry. Whenever workers are assigned to work in potentially IDLH areas, task specific procedures including training requirements shall be developed and strictly adhered to.

## **Cleaning and Disinfecting**

- Respirators will be cleaned and disinfected as outlined in the Respirator Protection Plan.

## **Storage**

- Respirators will be stored so that they are protected against damage, contamination, dust, sunlight, temperature extremes, excessive moisture, and damaging chemicals. When respirators are packed or stored, the face piece and exhalation valve will be stored in a manner that prevents deformation. Each respirator should be positioned so that it retains its natural configuration.

## **Inspection**

- Respirators used in routine situations will be inspected during cleaning, prior to issue and prior to use.

## **Repair**

- Repairs or adjustments to respirators will be done by an individual as appointed by the Program Administrator.
- Because components such as reducing and admission valves, regulators, and alarms are complex and essential to the safe functioning of SCBAs, they are required to be adjusted and repaired only by the manufacturer or a technician trained by the manufacturer.

**Breathing Air Quality**

- The Administrator will ensure that breathing air for atmosphere-supplying respirators will be of high purity, meets quality levels for content, and does not exceed OSHA contaminant levels and moisture requirements.

**Compressors**

- Compressors used for supplying breathing air must be constructed and situated so contaminated air cannot enter the air-supply system.

**Training and Information**

- The Respiratory Protection Program Administrator will appoint the individuals responsible for the proper care and use of site specific equipment.

**Recordkeeping**

- The Administrator shall retain copies of all respiratory protection program documents, including fit test and training records.
- All training records will include the manufacturer, type and model of respiratory protection equipment.

# **RIGGING SELECTION AND ANALYSIS & MATERIAL HANDLING PROGRAM**

Planning for safe rigging and lifting must begin at the design stage, and lifting procedures must be developed for assembly and installation. The lifting procedure should be developed and discussed with the rigging crew supervisor.

Riggers are responsible for final rigging and for carrying out whatever moves have been designated. The supervisor must make certain that personnel know how to move objects safely by hand or with mechanical devices in the operations normal to the area and must permit only those employees who are formally qualified by training and certification to operate a fork truck, crane, or hoist. The supervisor must enforce the use of safe lifting techniques and maintain lifting equipment in good mechanical condition.

Employees are required to observe all established safety regulations relating to safe lifting techniques. All employees shall be kept clear of loads about to be lifted and of suspended loads.

The Safety Department provides training programs followed by certification for employees who have demonstrated the ability to operate fork trucks of up to 4-ton capacity and for incidental crane operations that require no special rigging.

The Operator/Rigger Training Program is administered by the Safety Department. The training staff consists of a qualified crane consultant, professional riggers, and the Safety Department. There are two levels of required training and performance:

**Professional Operator/Rigger:** Person whose principal assignment includes crane operation and rigging functions. The chief operator/rigger must ensure that those professional operator/riggers under his/her supervision maintain the necessary qualifications.

**Incidental Operator/Rigger:** Person who performs operating/rigging functions as an incidental part of his/her normal work assignment. Persons in this category are restricted to lower load limits and rigging of specific types of hardware.

Incidental operator/riggers must be reexamined at least once every three years.

## **RIGGING EQUIPMENT**

- Determine weight of the load to be lifted.
- Select a sling (Attachments 31, 32, 33 & 34) having proper characteristics for the type of load, hitch and environment.
- Each sling must be tagged to show working load limits for each type of hitch and type of web material.
- Slings shall be protected from edges, abrasive surfaces and protrusions by using proper wear pads.
- Slings shall not be twisted or knotted.
- Slings shall not be pulled from under loads.
- Slings shall not be shock loaded.
- The openings in fittings or fabric eyes shall be the proper shape and size to insure that the fitting or eye will seat properly in the hook.
- Sling that are damaged or distorted shall not be used.

- Personnel shall be kept clear of loads about to be lifted and of suspended loads. Use taglines.
- Hands and fingers shall not be placed between the sling and its load.
- Do not exceed the working load limit.
- Do not expose web slings to temperatures above 194 deg F.
- Rigging equipment shall be inspected to ensure it is safe. Rigging equipment for material handling shall be inspected prior to use on each shift and as necessary during its use to ensure that it is safe.
- Defective equipment shall not be used and removed from service immediately.
- Rigging equipment shall not be loaded beyond its recommended safe working load and load identification shall be attached to the rigging.
- Rigging equipment not in use shall be removed from the immediate work area so as not to present a hazard to employees.
- Tag lines shall be used unless their use creates an unsafe condition. In any case, tag lines shall be kept as short as possible.

## **SLINGS, GUY LINES, LOAD LINES**

- Sling Use. Wire rope slings (Attachments 31, 32, 33 & 34) shall not be used with loads in excess of the rated capacities.
  - Minimum Sling length:
    - Cable Laid and 6 x 19 and 6 x 37 slings shall have a minimum clear length of wire rope 10 times the component rope diameter between splices, sleeves or end fittings.
    - Braided slings shall have a minimum clear length of wire rope 40 times the component rope diameter between the loops or end fittings.
    - Cable laid grommets, strand laid grommets and endless slings shall have a minimum circumferential length of 96 times their body diameter,
  - Safe Operating Temperature. Fiber core wire rope slings of all grades shall be permanently removed from service if they are exposed to temperatures in excess of 200 deg. F. When nonfiber core wire rope slings of any grade are used at temperatures above 400 deg. F, or below minus 60 deg. F, the sling manufacturer's recommendations shall be followed.
- Sling Use. Synthetic web slings, each sling (Attachments 31, 32, 33 & 34) shall be marked or coded to show the rated capacities for each type of hitch and type of hitch and type of synthetic web material.
- Webbing.
- Synthetic webbing shall be of uniform thickness and width and selvage edges shall not be split from the webbing's width.
  - Fittings shall be:
    - Of a minimum breaking strength equal to that of the sling; and
    - Free of all sharp edges that could in any way damage the webbing.
    - Attachment of end fittings to webbing and formation of eyes. Stitching shall be the only method used to attach end fittings to webbing and to form eyes. The thread shall be in an even pattern and contain a sufficient number of stitches to develop the full breaking strength of the sling.
    - Sling Use.
- Synthetic web slings shall not be used with loads in excess of the rated capacities.
- Environmental Conditions.
  - When synthetic web slings are used, the following precautions shall be taken:
  - Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present.
  - Polyester and polypropylene web slings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.
  - Web slings with aluminum fittings shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present.

- Safe Operating Temperatures. Synthetic web slings of polyester and nylon shall not be used at temperatures in excess of 180 deg. F.
- Removal from Service.
  - Synthetic web slings shall be immediately removed from service if any of the following conditions are present:
    - Acid or caustic burns.
    - Melting or charring of any part of the sling surface.
    - Broken or worn stitches.
    - Distortion of fittings.
    - Snags, punctures, tears or cuts.
- Synthetic web slings shall be stored in an area or facility where they are not subject to heat above 150 deg. F or exposed to direct sunlight. Environments in which web slings are continuously exposed to ultra-violet light can affect the strength of web slings in varying degrees ranging from slight to total degradation. To minimize these effects, store slings not being used in a cool, dry and dark place. Visual indications of ultra-violet degradation are bleaching out of the color, increased stiffness and surface abrasion at points not normally in contact with the load.
- Do not overload slings.
- Do not drag slings along the ground or floor.
- Inspect cables and slings frequently. Before inspecting, clean surface dirt from the sling to reveal any hidden nicks, gouges, or other damage. If, during inspection, or at any other time you notice that a sling is defective, remove it from service and label it as “Defective Sling, Do Not Use” and give it to your superintendent or supervisor for repair or destruction.
- Never jerk the load, jerking can overload the equipment.
- When wrapping around sharp corners or picking heavy loads with corners, use softeners or other pads.
- When slings are not in use, pick them up and store them.
- Check slings to make sure that the length marked on them corresponds to the actual length. If the sling is longer than marked, it may have been overloaded.
- Do not use a sling in good condition beyond its rated capacity. Allow for an extra safety factor for a sling in only fair condition. Do not use a sling in poor condition. Nylon web slings should be removed from service if they are burned by heat, acids, or caustics, if the stitches are broken or worn, if fittings are distorted, if the webbing is snagged, punctured, or torn, or cut, or if any other defect that might affect the strength of the sling is observed. Wire rope slings should be removed from service if any of the following is observed.
  - Six randomly distributed broken wires in one rope lay, or three broken wires in one strand of rope lay.
  - Wear or scraping of one-third of the original diameter of outside, individual wires.
  - Kinking, crushing, bird caging, or any other damage resulting in the distortion of the wire rope structure.
  - Evidence of heating or electric arc damage.
  - End attachments that are cracked, deformed, or worn to the point where the rated capacity is reduced.
  - Corrosion that is of such severity or extent as to reduce the rated load capacity or the rope end attachment.
  - Do not make temporary repairs on a sling. Turn it over to your superintendent for repair or destruction.
  - When guy lines or load lines are unrigged or taken down, they should be inspected. Defective or damaged rope or cable should be destroyed to prevent further use.



- Lines for hoists or cranes should be long enough that at least two full wraps will be left on the drum at any point in their operation.
- Guy lines should be flagged at all locations where they cross paths used by foot or vehicle traffic.
- Before you make the first pick with a particular rigging, be sure to have your superintendent inspect all parts of the rigging.

## ROPES

- Turn in old, worn or damaged rope to your superintendent for replacement or removal from service. Damaged rope should be cut into short lengths to keep it from being used again. Do not use manila rope close to welding operations or other sources of heat.
- If rope has been exposed to high heat, check its condition carefully before using it again.
- Keep manila rope as dry and clean as possible. Protect it from acid, fumes, and chemicals. Inspect the center strands frequently from rotting or other damage.
- Avoid overloading and shock loading.
- Protect the rope from sharp edges and sharp bends with softeners or other padding. Protect rope from chafing and kinks.
- Coil or uncoil wire rope by rolling and unrolling it as if it were a roll of tape; this helps prevent twisting and kinking of the rope.
- Any repairs made to ropes or sling assemblies must be tested to at least 2 times their planned rating. Testing shall be made with known weights, and a written record of proof loading shall be maintained by the Safety Department.
- On wire rope, use the number of clamps specified in the following table:

Rope Diameter in Inches	Number of Clamps per Eye		Rope Diameter in Inches	Number of Clamps per Eye
3/16	2		1 1/8	5
1/4	2		1 1/4	5
5/16	2		1 3/8	6
3/8	2		1 1/2	6
7/16	2		1 5/8	6
1/2	3		1 3/4	7
5/8	3		2	8
3/4	4		2 1/8	8
7/8	4		2 1/4	8

### ATTACH A WIRE ROPE CLAMP AS FOLLOWS:

- Place the U-bolt on the “dead” or short side of the rope, and the saddle on the “live” or long side. Remember the phrase “Never saddle a dead horse”.
- Attach the clamp farthest from the eye first. Tighten it.
- Place the clamp nearest the eye next. Don’t tighten it.
- Place any other clamps in position loosely.
- Minimum spacing of clamps is six times the rope diameter.
- Place a light load on the rope to stretch it and equalize tension.
- Tighten all clamps. Be careful not to tighten the clamps so much that they unduly distort the rope.

## **HOOKS**

- Hooks on overhaul ball assemblies, lower load blocks, or other attachment assemblies shall be of a type that can be closed and locked, eliminating the hook throat opening. Alternatively, an alloy anchor type shackle with a bolt, nut and retaining pin may be used.

## **LIFTING DEVICES**

- Lifting devices must be used for lifting and moving objects that are too heavy or bulky for safe manual handling by employees. Employees who have not been trained must not operate power-driven mechanical devices to lift or move objects of any weight. Heavy objects that require special handling or rigging must be moved only by riggers or under the guidance of employees specifically trained and certified to move heavy objects.

## **INSPECTIONS**

- Each mechanical lifting or moving device must be inspected periodically. Each lifting device must also be inspected before lifting a load near its rated capacity. Defective equipment must be repaired before it is used. The rated load capacity of lifting equipment must not be exceeded.
- Material moving equipment must be driven forward going up a ramp and driven backward going down a ramp.
- Traffic or personnel shall not be allowed to pass or work under a raised load.
- The floor-loading limit must be checked before mobile lifting equipment enters an area. Passengers must not be carried on lifting equipment unless it is specifically equipped to carry passengers.

## **LOAD PATH SAFETY**

- Loads moved with any material handling equipment must not pass over any personnel. The load path must be selected and controlled to eliminate the possibility of injury to employees should the material handling equipment fail.
- Equipment worked on while supported by material handling equipment must have a redundant supporting system capable of supporting all loads that could be imposed by failure of the mechanical handling equipment. A suspended load must never be left unattended but must be lowered to the working surface and the material handling equipment secured before leaving the load unattended.
- For moving loads around power lines rated 50 kV. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet. For power lines higher than 50KV, increase the clearance distance by 0.4" for every 1,000 volts above 50KV, or the recommended clearance of the local utility whichever is greater.

## **TRUCK LOADING**

- All objects loaded on trucks must be secured to the truck to prevent any shifting of the load in transit. The wheels of trucks being loaded or unloaded at a loading dock must be chocked to prevent movement.

## **CLEAN WORK AREAS**

- All areas controlled by Brink Constructors, Inc. must be kept in orderly and clean condition and used only for activities or operations for which they have been approved. The following specific rules must also be followed:
- Keep stairs, corridors, and aisles clear. Traffic lanes and loading areas must be kept clear and marked appropriately.
- Store materials in work rooms or designated storage areas only. Do not use hallways, fan lofts, or boiler and equipment rooms as storage areas.
- Do not allow exits, passageways, or access to equipment to become obstructed by either stored materials or materials and equipment that is being used.
- Arrange stored materials safely to prevent tipping, falling, collapsing, rolling, or spreading - that is, any undesired and unsafe motion.

- Do not exceed the rated floor capacity of stored material for the area. The load limit and the maximum height to which material may be stacked must be posted.
- Place materials such as cartons, boxes, drums, lumber, pipe, and bar stock in racks or in stable piles as appropriate for the type of material.
- Store materials that are radioactive, fissile, flammable, explosive, oxidizing, corrosive, or pyrophoric only under conditions approved for the specific use by the Safety Department.
- Segregate and store incompatible materials in separate locations.
- Remove items that will not be required for extended periods from work areas and put them in warehouse storage.

Temporary equipment required for special projects or support activities must be installed so that it will not constitute a hazard.

- A minimum clearance of 36 inches must be maintained around electrical power panels.
- Wiring and cables must be installed in a safe and orderly manner, preferably in cable trays.
- Machinery and possible contact points with electrical power must have appropriate guarding.
- The controls for temporary equipment must be located to prevent inadvertent actuation or awkward manipulation.
- When heat-producing equipment must be installed, avoid accidental ignition of combustible materials or touching of surfaces above 60 degrees C (140 F).
- Every work location must be provided with illumination that meets OSHA requirements. Evaluation of illumination quality and requirements is made by the Safety Department, but the supervisor of an area is responsible for obtaining and maintaining suitable illumination.
- Areas without natural lighting and areas where hazardous operations are conducted must be provided with enough automatically activated emergency lighting to permit exit or entry of personnel if the primary lighting fails.
- Most of the material presented in this chapter is related to the commonplace and obvious. Nevertheless, a majority of the incidents leading to injury, occupational illness, and property damage stem from failure to observe the principles associated with safe materials handling and storage.
- A less obvious hazard is potential failure of used or excessive motorized handling or lifting equipment. The Safety Department must be notified whenever it is desired to acquire a crane, forklift truck, or other motorized handling or lifting equipment.

## **LIFTING AND MOVING**

- Lifting and moving of objects must be done by mechanical devices rather than by manual effort whenever this is practical. The equipment used must be appropriate for the lifting or moving task. Lifting and moving devices must be operated only by personnel trained and authorized to operate them. Employees must not be required to lift heavy or bulky objects that overtax their physical condition or capability.

## **MANUAL LIFTING RULES**

- Manual lifting and handling of material must be done by methods that ensure the safety of both the employee and the material. It is Brink Constructors, Inc. policy that employees whose work assignments require heavy lifting be properly trained and physically qualified, by medical examination if deemed necessary.
- The following are rules for manual lifting:
  - Inspect the load to be lifted for sharp edges, splinters, and wet or greasy spots.
  - Wear gloves when lifting or handling objects with sharp or splintered edges. These gloves must be free of oil, grease, or other agents that may cause a poor grip.
  - Inspect the route over which the load is to be carried. It should be in plain view and free of obstructions or spillage that could cause tripping or slipping.

- Consider the distance the load is to be carried. Recognize the fact your gripping power may weaken over long distances.
- Size up the load and make a preliminary "heft" to be sure the load is easily within your lifting capacity. If it is not, get help.
- If team lifting is required, personnel should be similar in size and physique. One person should act as leader and give the commands to lift, lower, etc.
- Two persons carrying a long piece of pipe or lumber should carry it on the same shoulder and walk in step. Shoulder pads should be used to prevent cutting shoulders and help reduce fatigue.
- To lift an object off the ground, the following are manual lifting steps:
  - Make sure of good footing and set your feet about 10 to 15 inches apart. It may help to set one foot forward of the other.
  - Assume a knee-bend or squatting position, keeping your back straight and upright. Get a firm grip and lift the object by straightening your knees - not your back.
  - Carry the load close to your body (not on extended arms). To turn or change your position, shift your feet - don't twist your back.
- The steps for setting an object on the ground are the same as above, but in reverse.

# STRUCTURE ERECTION PLAN AND PROCEDURE

## CRANE AND RIGGING OPERATING RULES

- Inspect the unit daily. Carefully inspect the boom, pins, sheaves, liquids, tires, wire rope, hooks, outriggers, safety devices, operation functions, hydraulic and fluid leaks, etc.
- Inspect rigging equipment (Attachments 31, 32, 33 & 34) before each use, wire rope, nylon slings, shackles, hooks, etc.
- Rigging equipment that is worn, damaged or missing the manufacturer load tag will be removed from service and disposed of properly.
- Tag lines will be employed on all lifts.
- The crane position will be determined by its capacity and material to be handled.
- When positioned, set the brakes or block the wheels and level the machine before raising the boom.
- Cranes designed for carrying a load will only be on level ground with the load kept as low as possible. NO RIDERS.
- Maintain your distance from energized power lines. (Attachment 35)
- No one is allowed under a load being hoisted.
- Never use boom for side pulls.
- One designated signal man.

## AERIAL MANLIFTS OPERATING RULES

- Inspect the unit daily: boom, pins, man basket, railing, liquids, tires, safety devices, etc.
- Aerial devices must not rest on any structure.
- Test controls and functions prior to each use.
- Only authorized personnel will operate.
- Belt off to the unit at all times with approved harness and shock absorbent lanyards (Attachment 19).
- Brakes will be set when in use or parked.
- Remain on the aerial device floor, DO NOT stand on the rail to work.
- DO NOT move with the boom elevated, unless it is manufactured for this type of use.
- DO NOT belt off to a structure when in an aerial device.
- NO ONE is allowed under anyone working in the air. Stay clear.
- DO NOT drop anything from an aerial device.
- DO NOT use around any energized power lines.

## FORKLIFTS AND SKID STEER LOADERS OPERATING RULES

- ONLY trained and authorized drivers operate forklifts or skid steer loaders.
- Stunt driving and horseplay are prohibited.
- NO ONE is permitted under the forks, empty or with an elevated load.
- Employees WILL NOT ride on the forks.
- Inspect the vehicle before use.
- Check load weight and load chart before lifting.
- DO NOT move until all persons are in the clear.
- Carry the forks low, with or without a load.
- When parking, lower the forks, shut the engine off, set the parking brake and block the wheels.
- Use extreme care when tilting an elevated load.
- DO NOT leave the operator seat when the load, forks or arms are raised.

- Check your route of travel and be sure all is clear before moving.
- DO NOT use around any energized power lines.
- Be careful to avoid slips and falls when getting on or off of the machine.
- Neglect or violation of any Safety Rule is grounds for termination.

## **GENERAL ERECTION**

Crane operation will be by qualified operators (Attachments 43 & 45) only.

Cranes will be certified, inspected and load tested prior to initial use, and inspected daily before use. Load weight and distance will be kept below the manufacturer's Rated Capacity Plates. This will determine the crane and load position for each lift.

Rigging will be with new or like new slings. Nylon slings will have the manufacturer's load capacity attached to each individual sling. Wire rope slings and shackles (screw pin type only) will be used in accordance with OSHA 1926.251. All working shackles will have the manufacturer's load rating on each shackle. Slings will be inspected before each item to be erected is rigged. Protection from sharp corners will be accomplished by manufactured sling protectors or rubber belting mats. Tag lines will be used at all times for control by ground level people. See "Rigging Selection and Analysis". It is this Company's policy that no one is allowed to be standing or working under any load or aerial man lift, and will be strictly enforced.

Signals will be by one designated person, however, anyone involved is able to stop movement. This plan and procedure is in strict compliance with our Safety Policy, and OSHA. Also, see the attached company policy Operating Rules.

No erection of material or equipment will be allowed during windy or lightning conditions. Equipment and steel will be grounded to the yard ground grid as soon as possible after erection.

Where erection takes place around any energized lines, certified grounds will be installed on steel, equipment, cranes and man lifts before erection and maintained throughout.

All personnel working in man lifts or on structures will be belted off at all times, maintaining 100% fall protection. OSHA approached manufactured body belts and straps will be checked daily and removed from service if not deemed in good condition.

## **ERECTION**

The erection of steel structures and equipment will be accomplished with cranes with annual inspections.

Steel and equipment will be located in position by the means of forklift or hauled to location and unloaded by crane.

The large multi-piece steel will be erected in sections.

Crane position will be within the load capacity radius of the crane in use. The weight of each item will be determined from the manufacturer's drawings. The weight of all rigging will be added to these to acquire an accurate total weight being erected.

Smaller steel and equipment will be erected again, using the manufacturer's weights for proper positioning.

Aerial erection and assembly will be by linemen in man lifts in strict compliance with the "Aerial Man lifts - Operating Rules" of this plan.

Safety meetings are held weekly and additional "Tailgate" meetings will be held for erection procedures during the course. In addition, a Job Hazard Analysis (Attachments 9) will be reviewed and documented prior to each scope of erection.

The large electrical equipment will be erected per the manufacturer's instructions and outlines. At this time we are waiting for information regarding the larger equipment in reference weights and assembly.

# **SUBCONTRACTOR MANAGEMENT PLAN**

## **POLICY**

The subcontractor shall have a comprehensive written safety and health program. All employees shall understand basic element of this program prior to assignment to the project.

The subcontractor's safety plan, depending on scope of their work should address the following elements:

- Safety Policy
- Control Measures
- Safety Inspections/Audits
- Disciplinary Program
- Training Policy
- Project Site Employee Orientation Program
- Recordkeeping Policy
- Accident/Exposure and investigations policy
- Emergency Action Plan
- Site-Specific medical Emergency plan
- Hazard Communication Program
- Written Trenching and Shoring Plan (if applicable)
- Written 100% Fall Protection Plan
- Personal Protective Equipment

## **SITE SPECIFIC SAFETY PLAN**

Subcontractors are required to submit their site-specific safety plan (SSSP) prior to the pre-construction meeting. In addition, their safety and health plan is reviewed by our Safety Department to assure that they meet the requirements of the site safety and risk control expectations. A subcontractor safety meeting will be held before initiating project work. This meeting is to review project requirements for safety and risk control. The subcontractor's safety officer and designated Competent Person(s) and any other necessary subcontractor's representatives shall attend the meeting. In addition, subcontractors will be included in any tool box talk safety meetings, job safety analysis (JSA's), jobsite safety inspections, and any pre-job meetings or safety orientations with the site owner.

The subcontractor shall present project-specific safety requirements, including a review of various roles and responsibilities of personnel, an initial overview of project risks, and elements of hazard control/ countermeasures appropriate to potential exposures.

## **SUBCONTRACTOR TRAINING REQUIREMENTS**

Subcontractor training records may be maintained electronically and/or on site in the job site office. These records shall be available to BCI, the site owner, and government agencies upon request.

The subcontractor shall conduct a project specific safety orientation for all subcontractor personnel who work on the project before the personnel are allowed to perform any work.

## **SUBCONTRACTOR INCIDENT REPORTING**

The subcontractor's foreman or superintendent must ensure that all incidents are reported to BCI as soon as possible, but in no case more than four hours of the occurrence. The subcontractor's foreman or superintendent will follow up any verbal report with a copy of the subcontractor's incident report. Included with this report shall be any monitoring or corrective action plans. Copies of all incidents reported, including near misses (Attachment 4), must be maintained on site.

Upon completion of a job, BCI shall conduct a post-job safety performance review of the subcontractor. This review shall be made available to the Safety Department and the site owner's representative.

## **SUBCONTRACTOR PREQUALIFICATION**

Project procurement procedures require that all subcontractors submit prequalification documentation for evaluation. Subcontractors will be pre-qualified by reviewing their safety programs, safety training documents, and safety statistics (Attachment 41). Acceptable safety metrics are an affirmative answer to those questions which are applicable to the subcontractor (see Subcontractor Qualification Scorecard) and average or better scores under OSHA Information (see OSHA Information Sheet) and will be used as criteria for selecting subcontractors. Executive Management of BCI will conduct the safety prequalification evaluation in accordance with the subcontractor prequalification process and scorecard form (included).



# VEHICLE ACCIDENT REPORTING PROCEDURE

## **PURPOSE:**

To establish instructions for employee procedure and the conduct for reporting all accidents involving BCI owned or leased vehicles (“Company vehicle”).

## **EMPLOYEE PROCEDURE AND CONDUCT:**

Every employee involved in an accident while operating a Company vehicle shall adhere to the following guidelines:

- Remain calm and display courtesy to all parties involved. Remember that you are representing BCI.
- Notify the local law enforcement agency immediately. Do not move the vehicles involved until law enforcement officers have authorized removal, unless absolutely necessary to facilitate flow of traffic.
- Check for injured persons. Do not render first aid unless you are qualified. Call medical personnel or ambulance if necessary.

**DO NOT ACCEPT RESPONSIBILITY FOR ACCIDENT.** Do not engage in controversy of any kind. Politely tell the involved persons your name, address, that you work for BCI that you will make an immediate report to your supervisor, and ask them to contact the BCI Safety Department for any further information. Discuss the accident with only your supervisor, BCI Management, the Safety Department and law enforcement officers.

**NOTIFY YOUR SUPERVISOR IMMEDIATELY.** If your supervisor is not available, contact the Safety Department or any manager/supervisor who will act in place of your supervisor.

Complete the Employee Report of Vehicle Accident (located in BCI owned vehicles or available from the job superintendent) and present to your immediate supervisor the day of the accident.

If the accident causes injuries or death to a person or property damage (\$1000.00 damage to a single vehicle or \$2,000.00 damage to multiple vehicles), you must notify the nearest law enforcement agency, and it is your legal responsibility to submit a written report of the accident to the State Motor Vehicle Department.

A Personal Injury Report shall be completed by or for each injured employee (Attachment 5).

If any of the following events has occurred as a result of an accident while driving a commercial vehicle, the Safety Department will report the accident as required by law to the regional Motor Carrier Safety Office.

- The death of an individual, or
- Injury to a person requiring immediate treatment away from the scene of the accident, or

- One or more vehicles incurred disabling damage and removal from scene requires
- Transport by another motor vehicle.

Be prepared to provide the following information:

- Date and time of accident
- Location of the accident
- Name of the individuals involved
- Number of persons injured or killed
- Total property damage estimate
- Number and type of vehicles involved
- Description of the accident
- Name of person making report
- Contact number for the person making report

### **RESPONSIBILITY OF SUPERVISORS / MANAGERS:**

The following guidelines shall be followed by supervisors whose employees are involved in Company vehicle accidents:

- When a member of management other than the employee's immediate supervisor is notified, they should contact the applicable supervisor as soon as possible but should act in their behalf until such contact is made.
- If you have no details regarding an accident, or if you know that it is of a serious nature, go to the scene as soon as possible and aid the employee with the specified requirements detailed in Section II of this procedure.
- Breath Alcohol and Urine Drug screen test will be conducted on the operator of the equipment involved in the accident immediately following the accident or as soon as possible if circumstances or location preclude to Supervisor from escorting the employee to complete the testing.
- Make no statements to the press.
- The Supervisor's Report of Vehicle Accident must be completed as soon as possible but no more than 48 hours after the time of the accident and forwarded to the Safety Department. See that all information is obtained for the necessary reports and that appropriate Company personnel and law enforcement authorities have been notified.
- All necessary reports are to be forwarded as soon as possible.
- If an employee is injured, follow the procedures outlined in the Employee Injury and Accident Reporting Policy.
- All serious vehicle accidents or those involving more than minor injury to any person, will be investigated as soon as possible by the Safety Department or a BCI Senior Management member.

- Assumption for the responsibility of an accident, or authorization for the repair of a vehicle involved in an accident, must be determined by the Safety Department or Senior Management of BCI. In the event there is no question of injury to other persons, our employee was clearly at fault, and our public relations may be in jeopardy, the Company may want to assume responsibility prior to formal review, provided the damage is minor and the affected party will sign a release of liability. When the above conditions exist, you should have the affected party obtain at least two competitive estimates from reliable repair facilities and call the Safety Department or member of Senior Management for authority to obligate the Company for the repairs.
- In all other cases where the other party wishes to file a claim, explain that you will see that the Company will perform an immediate investigation, and suggest that they obtain at least two repair bids for submission to the Company. These bids should be sent to the Safety Department promptly.
- For damages to the Company vehicle, obtain at least two competitive estimates on letterheads of reliable repair facilities and forward these to the Safety Department as soon as possible. If the Company vehicle damage prevents operation, make arrangements to have it towed and notify the Safety Department as to the location.
- 10) In the event of a two or more party accident and the public driver is clearly at fault and liable for the damages to the Company vehicle, make sure to obtain the name of the insurance carrier **at the scene of the accident**.
- The Safety Department or member of Senior Management will contact the insurance carrier and will authorize for repairs to the Company vehicle.
- Payment for repairs should be made by the insurance carrier directly to the authorized business making the repairs.
- A purchase order should be used as a last resort or in those cases where the public driver is uninsured.
- Every effort will be made to collect for damages from an uninsured public driver.

**NOTE: It is extremely important that the Safety Department be notified immediately of an accident involving a Company vehicle. It is the responsibility of both the employee and the supervisor to ensure prompt and accurate notification.**

## Attachments

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Attachment 1	Safety Orientation Handout
Attachment 2	New Employee Safety Orientation Check List
Attachment 3	Drug and Alcohol Manual Receipt
Attachment 4	Non-Injury Accident and Near Miss Report
Attachment 5	Personal Injury Report
Attachment 6	Accident Investigation Worksheet
Attachment 7	Supervisor Accident Investigation Report
Attachment 8	Aerial Lift Check List
Attachment 9	Job Hazard Analysis
Attachment 10	Safety Meeting Report
Attachment 11	Job Site Safety Inspection Check List
Attachment 12	Confined Space Permit
Attachment 13	US DOL Notice of Alleged Safety or Health Hazard
Attachment 14	Employee Safety Suggestion Form and Report of Unsafe Condition Form
Attachment 15	Notice of Safety Infraction
Attachment 16	Daily Crane Inspection Check List
Attachment 17	Limited Approach Boundary Table
Attachment 18	Forklift Operator's Daily Check List
Attachment 19	Harness and Lanyard Inspection Check List
Attachment 20	Hazard Communication Training Record
Attachment 21	Hearing Conservation Program Training Record
Attachment 22	Lock Out – Tag Out Form – Energy Control Procedure Form
Attachment 23	Lock Out – Tag Out Form – Lock Removal Procedure Form
Attachment 24	Lock Out – Tag Out Form – Annual Energy Isolation Form
Attachment 25	Personal Protective Equipment Issue Form
Attachment 26	Project Safety Check List

Attachment 27	Fire Hazard Tables (Rapid City Only)
Attachment 28	Heat Index and Wind Chill Charts
Attachment 29	Hydrogen Sulfide Handout
Attachment 30	Monthly Ladder Inspection Check List
Attachment 31	Hoisting Signals
Attachment 32	Sling Inspection Work Sheet
Attachment 33	Forged Shackle Chart
Attachment 34	Sling Information Handout
Attachment 35	Respirator Selection Handout
Attachment 36	Respirator Protection Fit Test Chart
Attachment 37	Respirator Protection Requirement Handout
Attachment 38	Respirator Protection Cartridge Use and Duration Chart
Attachment 39	Supplied Air Equipment Check List
Attachment 40	Respirator Protection Hazard Evaluation Summary
Attachment 41	Sub-Contractor Qualification Score Card

# **BRINK CONSTRUCTORS, INC.,**

## **SAFETY ORIENTATION**

### **SAFETY ALWAYS**

#### **GENERAL SAFETY REQUIREMENTS**

##### **COMPLIANCE**

- BCI shall ensure that employees, agents and their subcontractors comply with all applicable Health, Safety and Environmental standard requirements (HSE), including but not limited to, federal, state and local regulations; specifically the latest edition of 29 CFR 1926.

##### **SITE REQUIREMENTS**

- BCI is required to meet all applicable federal, state and local requirements for adequate drinking water, first aid and PPE safety requirements.

##### **ACCIDENT AND HAZARD REPORTING**

- All injuries, accidents and safety hazards shall be immediately reported to the employee's immediate supervisor, the Site Safety Officer and the Project Superintendent. Failure to report injuries and accidents immediately is grounds for disciplinary action, up to and including termination.
- All applicable OSHA recordkeeping forms will be kept on-site and will be available for review upon request.

##### **PERSONAL PROTECTIVE EQUIPMENT**

- Approved hard hats shall be worn at all times by all personnel when in work site areas and other work areas with potential overhead hazards. All work area sites are 100% hard hat compliant.
- Other items necessary for safety or protection shall be issued by the subcontractor as required.
- Long pants, shirts with sleeves and protective footwear are required.
  - Sneakers, sandals, athletic shoes and other light duty footwear are not acceptable.
- Hair styles which create a hazard shall be adequately controlled.

- Additional P.P.E. as required:
  - fall protection above six feet, protection
  - face shields shall be worn when cutting, grinding and chipping
  - chemical splash goggles shall be worn when handling chemicals, acids and caustics in which the MSDS requires their use.
  - Hearing protection is required as needed.

## **LIFTING**

- Lifting and material handling shall be conducted in a controlled manner with consideration given to proper lifting techniques, using mechanical means and protecting against hand injury.

## **VEHICLES**

- Only licensed drivers shall be allowed to operate vehicles.
- Seat belts shall be worn at all times when in vehicles.
- The speed limits shall be strictly observed.
- All traffic violations received during duty hours shall be reported to the employee's supervisor.
- All DUI offenses and any suspension of licenses shall be immediately reported to supervisor.

## **ELECTRICAL TOOLS AND EQUIPMENT**

- Ground Fault Circuit Interrupters (GFCI) shall be used on all electrical tools and hand held equipment.
- BCI will ensure that the assured grounding program is in place and is effective.
- All electrical tools shall be visually inspected daily and defective tools shall be removed from service and repaired in accordance with the manufacturer's recommendations.

## **HAND TOOLS**

- All tools use shall be in safe and good working condition. All hand tools must be visually inspected prior to use. Defective or damaged tools shall be removed from the job site.

## **FALL PROTECTION**

- All BCI personnel will be trained in the hazards and control measures associated with working at heights six feet and higher.
- For each project, a Job Hazard Analysis (Attachments 9) shall be prepared that specifies the control measures to be used to protect personnel who may be exposed to fall hazards in accordance with 29 CFR 1926.500, Subpart M-Fall Protection.
- All fall protection equipment shall be in good working order and shall be inspected by the competent person prior to each use.

## **LADDERS**

- All ladders shall be in safe condition and have a minimum 300 pound duty rating.
- Damaged ladders with broken rungs, split side rails or other defects shall not be used and shall be removed from the job site.
- Extension ladders shall be secured and shall extend a minimum of three (3) feet above the upper working surface.
- Stepladders shall be used in the open position, and the top two steps shall not be used for weight bearing support.
- Fall protection shall be used for extensive work (work more than fifteen minutes) on stepladders when working more than six feet (6) feet from the ground.
- Fall protection shall also be used when the ladder places the waist of the worker above an adjacent platform handrail and creates a fall hazard of a greater distance than to the level of the base of the ladder.
- Non-conductive ladders shall be used for all electrical work. Ladders will be used as recommended by the manufacturer.
- Do not use an a-frame ladder in place of a straight ladder.
- All employees will use the three point connection method when climbing ladders.
- Do not carry tools or materials in your hands while climbing a ladder.

## **EXCAVATION**

- All work involving excavations shall be conducted in accordance with the requirements of OSHA 29 CFR 1926.652.
- Prior to the start of any excavation work, the subcontractor shall submit in writing its excavation competent person.
- Written proof of competency such as a certificate of training completed shall also be submitted.
- No trenching or excavation work shall be conducted without competent person approval and/or supervision.



- The competent person shall inspect the excavation for safety each day before work begins and assess for proper protective systems based on hazards and soil type.
- There shall be a minimum of two means of egress from each excavation.
- For larger excavations, a means of egress shall be accessible at least every 25 feet.
- If required, the subcontractor shall procure and comply with dig permits prior to beginning excavation.

## **HOISTING AND HEAVY EQUIPMENT**

- All cranes shall have a current certification sticker from an independent crane certification company, or the subcontractor shall demonstrate through objective evidence that the crane's inspection and maintenance program meets or exceeds OSHA requirements.
- Crane operators must have passed an annual physical as directed by OSHA Standards.
- Daily and periodic inspections shall be conducted and documented during the crane's use on the project as required by OSHA and the crane's manufacturer.
- Slings, chokers, wire ropes and other rigging shall be in good condition and shall be inspected prior to each use.
  - Personnel conducting inspections shall be qualified and able to detect signs of unsafe or damaged rigging. Inspections shall be conducted in accordance with 29 CFR 1926.251 Subpart H.
- All hoisting equipment (Attachments 31, 32, 33 & 34) shall be operated in a manner consistent with the manufacturer's guidelines.
- Taglines will be used to control swinging loads.
- Forklift operators will have the required OSHA Forklift Operator training.
- Backup alarms will be in good working condition and flagmen used as needed for backing.
- A seat belt in working condition is required on all mobile vehicles.
- All equipment operators will have received specific Operator Safety training/certification as directed by regulatory compliance regulations.

## **HAZARD COMMUNICATION**

- BCI has a written Hazard Communication Plan. Material containers shall be labeled as to contents and hazards. MSDS shall be available, on site, for review by employees. Workers shall be trained in the hazard communication program (Attachment 20). SDS shall be kept on site for each chemical brought onto the job site.

## **TRAINING**

- All personnel shall receive training as required by OSHA and the training must be properly documented.
- Required documentation includes topics, trainer, date of training, and signature of attendees. OSHA training includes, but is not limited to the following:
  - Ladders
  - Scaffolding
  - Excavation
  - hazard communication
  - respiratory protection equipment
  - powder actuated tools
  - hearing conservation
  - confined space entry
  - cranes and rigging
  - fall protection
  - hazard recognition
  - other OSHA standard requirements
- Training will be conducted on a regular basis to ensure safety and compliance.

## **FIRE PROTECTION AND PREVENTION**

- Work areas shall be kept free from combustibles and flammables liquids.
- Fire extinguishers and a qualified person designated as a “fire watch” shall be posted at all blind spots during hot work operations.
- Fire extinguishers shall be provided during use and/or storage of flammable or combustible materials.
- All flammable liquids shall be stored in OSHA approved flammable liquid safety cans which have spring loaded lids, flash arrest screens and venting capabilities.
- Hot work permit and/or work clearance is required prior to the performing hot work activities.

## **HOUSEKEEPING**

- Continuous housekeeping practices shall be maintained on all work sites.
- Personnel shall secure extension cords
- Sweep areas of trash and debris before leaving the site for the day.
- All supervisors shall conduct a walk-through of the job site at the end of each shift to identify any tripping, foot penetration, fire, or other safety hazard.

## **DRUGS, ALCOHOL AND “HORSE PLAY”**

- The use of drugs and alcohol and “horse play” on the job by any personnel is strictly prohibited.
- If influence of drugs is suspected, urinalysis testing may be required and administered by the licensed medical practitioner.

## **Safety Reflective Vest**

- High Visibility rated Traffic Vests shall be worn at all times when working on job sites.
- Vests must be Arc Rated when working on or within 10’ of energized equipment.

## **SIGNS AND BARRICADES**

- Signs and/or barricades will be used and maintained to warn and limit access to work areas.
- Barricades and/or barricade tape will be used to flag high hazard work.
- No one is allowed to enter into a barricade-controlled area without authorization from the Supervisor who erected the barricade.

## **SAFETY/ HEALTH INSPECTIONS**

- Each foreman and site supervisor will continuously monitor their work areas for unsafe conditions and unsafe acts.
- Unsafe conditions will be corrected immediately and unsafe acts will not be tolerated.

## **SANITATION AND HEALTH**

- Fresh potable water will be provided at the project site daily.
- A chemical toilet will be on site and serviced as required. Health and sanitation facilities will be in accordance of applicable parts of OSHA 29 CFR 1926.51.

## **SAFETY MEETINGS**

- Safety meetings (Attachments 10) will be held each Monday for all crew members.
- Each crew will conduct daily “tail gate” sessions at the work location site.
- All Safety meetings (Attachments 10) will be documented and kept onsite for review.

## **EMERGENCY RESPONSE**

- Each crew trailer will have a minimum 50-person First Aid kit onsite.
- Each crew vehicle will also have a first aid kit inside the cab area.
- Each kit will have the names, phone numbers and locations of Emergency providers, i.e., doctor, hospital and the designated contacts (Emergency Action Plan (EAP)).

## **COMPETENT PERSON DESIGNATION**

- The Competent Persons will be documented in writing prior to work and be available for review.

## **CELL PHONE POLICY**

- Only supervisory and management personnel are allowed to have cell phones and those will be Company-issued.
- Personal cell phones are prohibited on the job sites.

## **SMOKING POLICY**

- **Smoking is prohibited in BCI vehicles and on job site locations.**

## **FIREARMS AND OTHER WEAPONS**

- **Possession and or storage of firearms or other weapons is prohibited in BCI vehicles and on job site locations.**

# BRINK CONSTRUCTORS, INC

## NEW EMPLOYEE SAFETY ORIENTATION

Safety Orientation of new employees is not just a program; it is process by which employees learn about the Company and our safety rules, and in turn, the Company learns about its employees. The process can be mutually advantageous to both if it is similarly structured for all employees, consistently applied and regularly monitored.

The process itself should be based on a concept of guided self-learning; if the employees have responsibility for their own learning, they may develop greater interest in, and understanding of the Company's organization, goals and objectives.

Orientation of new employees should follow generally the same structure: most employees have had little or no introduction into the specific activities of our Company and how they relate to their own area of responsibility.

The long-term orientation is intended to allow employees time to assimilate new information with old, clarify perceptions and review with their supervisors how each piece fits into the overall picture.

Supervisors will assist in developing guidelines to cover all phases of the safety process. The intervals between employee/supervisor communications should be short during the first six months and can be lengthened to approximately reflect the employee's development/skills and knowledge based on position and need.

### CHECKLIST:

1. Present new employee with Company Safety Manual.
2. Have employee sign receipt page and ***return it to main office in Rapid City.***
3. Discuss and relate to employee BCI Best Practices for Safety.
4. Conduct a one-on-one Job Hazard Analysis (JHA) on the project you are currently working on.
5. Discuss your expectations of new employee and what their initial job duties will entail.
6. Show them around the project and discuss what you are trying to accomplish.
7. Introduce to the other employees and make them feel like part of the team.
8. Comments:

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Employee

Date

Supervisor

Date

**BRINK CONSTRUCTORS, INC**  
**RECEIPT OF**  
**DRUG AND ALCOHOL MANUAL AND MATERIAL**

I, \_\_\_\_\_ have received a copy of the  
(Print name)

Company policy regarding required drug and alcohol testing and information on the effects of drug and alcohol misuse. **I acknowledge that I have read the policy.** Should I have questions, I may contact my supervisor or the Safety Department, at the Rapid City office 605-342-6966.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Sign and return this page  
  
You may keep the remainder of the  
**booklet for your reference.....**

# BRINK CONSTRUCTORS, INC

## NON-INJURY ACCIDENT AND NEAR MISS REPORT

Project Name: \_\_\_\_\_ Project No: \_\_\_\_\_  
Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_

What kind of work was being done?


How many employees and what classifications were involved?


What kind of equipment was being used?


Was job hazard analysis conducted?


Were all "Company Safety Rules" being followed? List specific rules


Did all employees have on "Personal Protective Equipment"? List specific PPE and other protective devices used


Was there any property damage, (Company or private)? Describe any property damage


After answering these questions, describe exactly what happened and what caused the incident or near miss in the area below.


Make a list of Contributing Factors


Make a list of Corrective Actions


After completing report, stop work, gather the crew together and discuss the factors leading to the incident or near miss.

**Send a copy to Safety Department within 48 hours of incident for file.**

Revised: April 24, 2013



# BRINK CONSTRUCTORS, INC

## PERSONAL INJURY REPORT

<b>Section I Employee Information</b>				
Social Security #:	Date of Injury:	Date of Birth:	Date of Report:	
Last Name, First Name:		Education (circle one ) GED or High School		Less Than High School Beyond High School
Home address:		# Dependents:		
City, State, Zip:		Telephone Number		
Position title:	Employment type (circle one) Regular Temporary	Employment status (circle one) Full Time Part time Seasonal		
<b>Section II Employee's Report of the Events Leading to Injury and Description of Injury</b>				
Describe injury:		Body part injured:		
Describe what happened:				
What caused the accident? (See Section IV. on back for examples of causative factors)				
What could be done in the future to prevent this type of accident				
Location (where injury occurred)	Time of injury:            a.m.            p.m.			
Time work day began:	Date employer notified:			
Injury reported to:	Witness: )			
Employee's signature		Date		
<b>Section III Supervisor's Report of the Accident Investigation</b>				
Description of the accident (what happened—please include job task) Use additional paper if necessary:				
What are the basic cause(s) of the accident? (Please analyze all the factors and describe any unsafe acts or unsafe conditions. See Section IV. on back of form for examples of unsafe conditions and unsafe acts.) Unsafe conditions:  Unsafe acts:				
Did the employee receive medical attention?  Yes No		Has the employee returned to work?    Yes    No    If Yes, when?		
Name and address of treating physician:		Type of treatment: (circle one) No treatment    On-site Treatment  Clinic    Emergency Room    Hospitalization  If hospitalized, name of address of hospital		
Signature of supervisor:	Date of supervisor's investigation	Signature of Safety Officer:	Date Investigated:	Senior Management:

**Supervisor: Complete appropriate section of report and return to the Safety Department within 24 hours of the injury or illness.**

## **Section IV Reference examples for Accident Description**

### Causative Factors to be considered:

- Was the right equipment being used at the time of injury?
- Was the equipment in safe condition?
- Was the right material or tool being used?
- Was housekeeping contributory?
- Were working conditions right? Light, heat, ventilation, housekeeping, etc.
- Was employee new, or new to this job?
- Was employee properly task trained?
- Were employee's instructions thorough & complete?
- Was employee using the right work procedure?
- Was the job properly supervised?
- Was the employee suited to the job?
- Is the employee an accident repeater?

### A. UNSAFE CONDITIONS - EXAMPLES

- Inadequate guarding
- Lack of guarding
- Defective equipment
- Defective installation
- Unsafe design
- Unsafe loading, piling, stacking.
- Inadequate lighting
- Inadequate ventilation
- Poor housekeeping
- Unsafe footing
- Control failure
- Other (specify)

### B. UNSAFE ACTS - EXAMPLES

- Improper procedure
- Unsafe lifting, pushing, pulling
- Unsafe handling
- Horseplay
- Inattention
- Operating unsafe equipment
- Failure to wear protective equipment
- Protective equipment not provided
- Failure to keep clear
- Failure to secure part or load
- Operating without authority
- Other (specify)



	Inadequate ventilation
	Poor housekeeping
	Unsafe footing
	Control failure
	Other (specify)

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B. UNSAFE ACTS – (Check one or more if applicable)

CORRECTIVE ACTIONS

	Improper procedure
	Unsafe lifting, pushing, pulling
	Unsafe handling
	Horseplay
	Inattention
	Operating unsafe equipment
	Failure to wear protective equipment
	Protective equipment not provided
	Failure to wear protective equipment
	Failure to keep clear
	Failure to secure
	Operating without authority
	Other (specify)

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C. Why did employee perform unsafe act?

CORRECTIVE ACTIONS

	Lack of knowledge and experience
	Cannot perform job - Physically limited
	Was not instructed – No training
	Poor attitude
	Did not understand instructions
	Other (specify)

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<b>BRINK CONSTRUCTORS, INC.</b>		Supervisor's Report of Vehicle Accident	
Driver Name:		Department:	
Location of Accident:		Date and Time of Accident:	
Persons Injured and Extent of Property Damage ( <i>Company and others</i> ):			
Brief description of Accident ( <i>What happened</i> ):			
Unsafe Condition ( <i>Describe any unsafe conditions such as adverse weather or faulty equipment</i> ):			
Unsafe Act ( <i>Describe any unsafe act of the driver such as speeding, improper turn, etc.</i> ):			
Corrective Action ( <i>As a supervisor, what action will you or have you taken to prevent reoccurrence?</i> ):			
Supervisor:	Reviewed and Approved By:	Date Report Prepared:	
<i>(Use the space below and/or reverse side for sketch or additional detail)</i>			
<b>Supervisor: Return completed form to the Safety Department within 24 hours of accident.</b>			

**BRINK CONSTRCUTORS, INC. DAILY AERIAL LIFT INSPECTION**

**Type Equipment:**

**Unit No.**

**Location:**

**Job No.**

**Inspected by:**

**Date**

Indicate by initialing "Yes" if item checked is adequate is operational, and safe. Initial "No" to indicate repair or other action is required. Use NA to indicate "Not applicable".

	Yes	No	NA
a. Fuel level (applicable for engine drive only)			
b. Engine oil level (applicable for engine drive only)			
c. Hydraulic system level, visible leaks			
d. Battery, water level, condition, state of charge			
e. Tires, proper inflation, damage			
f. Platform structure, cleanliness, physical condition			
g. Instruction placards, in place and legible			
h. Eye wash bottle, fire extinguisher (if applicable)			
i. Test the tilt alarm (if applicable)			
<b>From the ground control station (Do all applicable portions):</b>			
a. Raise and lower platform/boom			
b. Raise platform/boom and lower with auxiliary power			
c. Raise platform/boom and lower with manual bleed valves			
d. Telescope out and in			
e. Swing platform right and left			
<b>From the platform control station:</b>			
a. Fasten safety harness			
b. Telescope out and in			
c. Raise and lower platform/boom			
d. Swing right and left			
e. Extend and level outriggers (if applicable)			
f. Drive machine forward and reverse, right and left			
g. Raise platform/boom and descend with auxiliary power			

Note: Defects found must be repaired prior to equipment use. On completion of inspection, retain this form with the equipment until the end of the workday. Then turn in to immediate supervision for filing.

\_\_\_\_\_  
Signature of Person Completing Repairs

\_\_\_\_\_  
Date Repaired

# BRINK CONSTRUCTORS, INC.

## JOB HAZARD ANALYSIS

**PROJECT NAME:** \_\_\_\_\_ **PROJECT NO.** \_\_\_\_\_

**Emergency Route:** \_\_\_\_\_

**Nearest Hospital:** \_\_\_\_\_

<b>Activity Location:</b>				<b>JHA No.</b>	
<b>Responsible Job Supervisor:</b>				<b>Date</b>	
<b>WORK CREW</b>					
Name	Initial	Name	Initial	Name	Initial

**LIST OF SPECIAL EQUIPMENT AND TOOLS:**


**SPECIAL INSTRUCTIONS OR LIMITATIONS:**

Consider: (1) Energized equipment (2) Experience of work crew (3) Engineering expertise available (4) Clearances and grounding requirements (5) Emergency capabilities such as First Aid/CPR.


**LIST OF IDENTIFIED HAZARDS AND HOW TO MINIMIZE OR ELIMINATE THEM:**

ACTIVITY	IDENTIFIED HAZARDS	CORRECTIVE ACTION OR PRECAUTION

(USE BACK IF ADDITIONAL SPACE IS NEEDED)

# BRINK CONSTRUCTORS INC.

## SAFETY MEETING REPORT

Project Name: \_\_\_\_\_ Project No. \_\_\_\_\_

**Items Discussed:**


**Problem Areas, Concerns or Comments:**


**Attendee Signatures**


\_\_\_\_\_  
Supervisor Signature



**BRINK CONSTRUCTORS INC.**  
**Jobsite Safety Inspection Checklist**

Jobsite \_\_\_\_\_ Superintendent \_\_\_\_\_

Date \_\_\_\_\_ Inspector \_\_\_\_\_

Pass Fail N/A

**General**

- The Company has a written safety program that is site specific where necessary.
- Emergency telephone numbers are located in a place that can be found quickly and easily.
- OSHA poster is posted.
- Minutes of jobsite safety meetings recorded are kept.
- Safety inspections reports by contractor personnel prepared and kept at site.
- OSHA 300 report is posted.
- All accidents and injuries are being appropriately recorded on the OSHA 301 forms.
- There is a competent person, someone capable of identifying existing and predictable hazards which are unsanitary, hazardous or dangerous, and who has authorization to take prompt corrective measures to eliminate them, on site.
- There is a current first aid kit on site.

**Sanitation**

- Toilet provided at the jobsite.
- Adequate supply of potable water at jobsites.
- Personal garbage and lunch sacks are removed from the site or properly disposed of so as not attract rodents, pests of insects.

**Housekeeping**

- Work site is clean and free of dangerous waste and material.
- Scrap materials are removed, or stacked in orderly fashion.
- Trash and combustible material are placed in containers provided for that purpose.
- Scrap lumber, hoses, cable wiring and all other debris is clear from work areas, hallways and stairways.
- Nails are removed from scrap lumber and other unused materials.
- There are no spills of liquid and materials that may cause an accident.
- Work areas have the appropriate amount of lighting.
- Holes and openings are protected and marked appropriately.

**Fire Prevention**

- A fire extinguisher is provided for every 3000 sq. ft. of space that is rated 2A at least.
- A portable fire extinguisher is within 100 ft. of all working areas.
- Portable heaters are being used in accordance with specifications.
- All employees or subcontractors know the location of the fire extinguisher and know how to operate it.
- Employees have been trained in how to properly use a fire extinguisher.
- Firefighting equipment is accessible and maintained at all times in good repair
- Smoking is prohibited in possible fire hazard areas.
- Flammable and combustible liquids are marked and properly stored appropriate containers.
- Soiled or combustion rags are properly stored or disposed of.

### ***Personal Protective Equipment***

- Employees, trade contractors, vendor, visitors and others on the site wear the appropriate personal protective equipment.
- Hard hats are worn in the construction areas where there is a risk of injury
- Mandatory eye protection is required on all projects in the construction area when the following conditions exist: all types of hammers, saws, chipping tools, brooms, grinders, impact tools, drills, chemicals, hazardous substances which create dust, mist, and fumes, concrete pouring, grouting, etc.
- Face shields are worn when a danger of harmful chemical or physical contact with the face is present.
- Those in areas of moderate, extreme or long term noise wear appropriate hearing protection.
- Only NIOSH/MSHA respirators approved for the work conditions are used when necessary.
- Respirators or appropriate filters are used when using substances containing toxic vapors, fumes or dust in oxygen deficient environments (less than 19.5% oxygen) or other hazardous areas.
- Those painting or working with hazard chemicals are wearing a respirator that meets those specific requirements.
- If disposable respirators are used by multiple persons, they are cleaned before each use.
- Persons working in confined or enclosed areas where they could be overcome by toxic fumes work only when an outside observer is present. Rescue equipment is be available at all times when such work is being performed.
- Those welding or working with metal or sharp objects are wearing safety and safety goggles.
- Overall workers are adequately protected.

### ***Hand & Power Tools***

- All hand and power tools in good working order
- Hand held powered tools equipped with constant pressure switch where appropriate.
- Devices are provided on air power tools to prevent tools from becoming accidentally disconnected from hose.
- Pneumatic nailers operating at more than 100 psi. are provided with safety devices on muzzle to prevent accidental discharge.
- Tools are stored in a dry secured place.
- Tools cords are free of cuts or abrasions and in good repair.
- Saws are guarded by the appropriate guards.
- Tools are being used for their intended use.
- Handles for hammers and other tools are in good condition free of cracks and splinters and free of mushroomed heads.
- All safety guards and devices are in place while the tools is in use.
- All powder actuated are unloaded while not in use.
- All air compressors are equipped with pressure gauges.

### ***Vehicle and Equipment***

- Construction equipment and vehicles are parked so as to prevent the release of stored energy (bucket/forks down, brake applied, wheels cocked, etc.).
- Only those who are authorized to operate machinery are permitted to so.
- All equipment has functioning signals and horns.
- Backup warning systems are functioning properly.
- Seatbelts are in good repair and used.
- Passengers are prohibited from riding on equipment.
- All mirrors are in place and operational.
- All windshields and glass are clean so vision is unobstructed.

- Flaggers are used when the operator is unable to see or to protect vehicular traffic or pedestrians when necessary.
- Equipment is kept from coming near to overhead power lines.
- Equipment role over protection equipment is in good shape.

### ***Trenching & Excavation***

- The underground utilities have been located and marked.
- Trenches 5' or more in depth are shored, or have sides sloped.
- The walls and faces of all excavation where employees are exposed to danger from moving ground are guarded by a shoring system, sloping, or benching of ground.
- The slope of benched or sloped excavations and the shoring is designed based on the type of soil.
- All parts of shoring system are in good repair.
- Excavations are no deeper than 2' below the base of any shoring system
- Excavated or other material is placed a minimum of 2' from the edge of excavations.
- Excavations have barricades surrounding them where necessary.
- Have all trenches four feet and greater been provided with stairways, ladders, or ramps within 25 feet of each employee.

### ***Concrete & Masonry***

- Limited access zones have been established and marked.
- All protruding reinforcing bars have been guarded.
- All free standing masonry walls are properly braced and supported.

### ***Electrical***

- Power circuits where accidental contact by tools or equipment may be hazardous, are marked with warnings explaining the hazard.
- All equipment is either grounded or double-insulated.
- GFCI circuits are installed on all 110-120 V temporary circuits.
- Temporary lights are equipped with guards to prevent accidental contact with bulb.
- Receptacles (attachment plugs) are not interchangeable with circuits of different voltages.
- Electrical cords are not frayed, cut, nicked and are in good repair.
- Electrical cords are not used for hoisting, or carrying tools or equipment.
- There are an appropriate number of outlets for the tools being used circuits are not overloaded.
- The circuit breaker panel is clearly labeled and secured.
- Electrical outlets are provided with a face plate.
- The Electrical panel has at least 4 square feet in front that is clear and unobstructed.
- Work areas are kept free of cords and excess equipment.

### ***Fall Protection***

- Holes or openings are barricaded or covered securely and marked.
- Those working above 6' off the ground are protected by a guardrail, safety net, or personal fall arrest system (exceptions are made for those installing trusses when a truss erection plan has been approved and adequate training provided).
- Employees working down below other employees or hazards are protected (hard hats, canopies, toe board, etc.).
- The time that employees subjected to fall hazards is minimized.
- Personal fall protection devices and equipment is provided with training on fall protection.
- Openings less than 44 inches off the floor and greater than six feet from any lower surface are protected by a guardrail or other suitable safety precaution.

- Rope guardrails are marked every six feet with a highly visible material.
- 100% tie off is required when working at or above 25'. This requires the use of 2 lanyards, life lines, or static lines.
- Personal fall arrest systems are inspected prior to each use by a competent person. Lanyard, harness, D-rings, and other personal fall arrest systems are in good condition and suitable for use.
- Fall arrest systems are anchored to an appropriate capable of withstanding 5000lbs of force.

### ***Scaffolding***

- Scaffolding is constructed by a qualified person
- Scaffold planks are free of splits, twists, & bows
- Scaffolds is in good repair
- All scaffolding will be erected per the manufacturer's instructions and will meet the guidelines outlined in OSHA Standards.
- Footing and anchors are sound, rigid, and capable of carrying 4 times the maximum intended load without settling or displacement.
- The scaffold is set up on an adequate flat base with baseplates on mudsills, screw jacks, etc.
- All connections are pinned or fastened securely.
- Cross bracing is used.
- Wheels are locked into place.
- Scaffolding or planking is properly supported on scaffold jacks and not on stacks of wood, boxes, bricks, blocks, barrels or any other unstable materials.
- Scaffold planks are certified scaffold planks or structural lumber.
- Planks overlap the end of the scaffold no less than 6" and no more than 12".
- The working surface of the scaffold is fully planked.
- The planks are secured to prevent slipping.
- The gap between planks is less than 1 inch to prevent tools, etc., from falling through.
- The distance between the scaffold and the working surface is less than 14 inches.
- The scaffold frame is used as access only if designed to do so otherwise ladders are used to gain access to scaffold work platforms.
- The maximum spacing of rungs used for access to the scaffold is 16 ¾".
- The scaffold is free of debris and material.
- The scaffold is tied off if it is more than four times the width of the base.
- All open sides and ends of platforms more than 10' above ground on floor level, are provided with top rails, midrails, and toe boards.
- Top rails are 42" high ± 3", midrails are midway between floor surface and top rail.
- Guardrails are capable of withstanding 200lbs of force anywhere along the top rail.
- Gates or bars are used to enclose the top level.
- On suspended scaffolds, lifelines are attached to structure and safety belts are used.
- Scaffold is tied off every 30' horizontally and 26' vertically, or tied off if the height exceeds 4 times the width of the base.

### **Stairways and Ladders:**

- Areas used for access and egress which have a change in elevation of more than 19" are provided with stairs, ladders or properly designed ramps.
- Stairs that have 4 or more steps have a handrail.
- Ladders that are at risk for displacement are tied off and secured.
- Ladders extend at least 3' above the landing.
- All job-built ladders are constructed in accordance with 29 CFR 1926.25 regulations.
- All ladders are in good repair with all safety stickers in place.

- Faulty ladders are tagged “do not use”, blocked with plywood, or rendered inoperable until repaired or removed or discarded.
- All ladders that have the potential of slipping or being bumped are tied off.
- All ladders are free of grease, oil, paint, or other slipping hazards.
- Step ladders are used in the open position.
- The spacing of rungs is between 10” and 14”.
- No metal ladders are used within 10' of electrical power lines.
- All manufactured single and extension ladders are equipped with ladder shoes.
- Extension ladders are placed so that the distance from the top support to the ladder base is 1/4 the working distance of the ladder.

***Subcontractors***

- All subcontractors have been trained in company safety requirements and policies.
- All subcontractors know who to contact if they have any questions or if they have seen unsafe working conditions or habits.
- Subcontractors understand that they are responsible to maintain their scope of work clean and clear of possible hazards.
- Subcontractors understand that potential hazards or accidents are grounds for disqualification of work on future projects.
- Subcontractors and their employees have been properly trained in safety and health and understand and comply with all OSHA requirements

## BRINK CONSTRUCTORS INC. CONFINED SPACE ENTRY PERMIT

NOTE: This form must be completed prior to entry of the confined space and posted near the entry opening. Upon completion of the project or expiration of a permit, a copy must be forwarded to the Safety Department.

Date of Issue:			Expiration Date:			
Time:			Time:			
Location of Space:						
Description of Space:						
Purpose of Entry:						
Hazard Assessment:						
Attendant(s):						
Signature of Employees to Enter:						
<b>SAFETY EQUIPMENT/REQUIREMENTS</b>	<b>Y</b>	<b>N</b>	<b>PERSONAL PROTECTIVE EQUIPMENT</b>	<b>Y</b>	<b>N</b>	
PIPE LINES PURGES OR FLUSHED			AIR PURIFYING RESPIRATOR - TYPE			
AREA SECURE AND SIGNS POSTED			SAFETY GLASSES OR GOGGLES			
TRIPOD/RETRIEVAL SYSTEM			HARD HAT			
COMMUNICATION EQUIPMENT			CHEMICAL RESISTANT CLOTHING			
GAS DETECTOR			PROTECTIVE BOOTS AND/OR GLOVES			
FIRE EXTINGUISHER			HEARING PROTECTION			
GROUND FAULT CIRCUIT INTERRUPT			CHEST HARNESS AND LIFE LINE			
LIGHTING			OTHER			
LOCKOUT/TAGOUT						
PIPE LINES CAPPED OR BLANKED						
MECHANICAL VENTILATION						
<b>TIME/DATE</b>	<b>%LEL(10%)</b>	<b>%O<sub>2</sub>(19.5-23.5)</b>	<b>H<sub>2</sub>S 10ppm</b>	<b>CO 35ppm</b>	<b>INITIALS</b>	<b>INSTRUMENT</b>
SUPERVISOR AUTHORIZING ENTRY (PRINT)			SIGNATURE			

# U. S. Department of Labor Occupational Safety and Health Administration

## Notice of Alleged Safety or Health Hazards

<b>For the General Public</b>	This form is provided for the assistance of any complainant and is not intended to constitute the exclusive means by which a complaint may be registered with the U.S. Department of Labor.
<p>Sec 8(f)(1) of the Williams-Steiger Occupational Safety and Health Act, 29 U.S.C. 651, provides as follows: Any employees or representative of employees who believe that a violation of a safety or health standard exists that threatens physical harm, or that an imminent danger exists, may request an inspection by giving notice to the Secretary or his authorized representative of such violation or danger. Any such notice shall be reduced to writing, shall set forth with reasonable particularity the grounds for the notice, and shall be signed by the employee or representative of employees, and a copy shall be provided the employer or his agent no later than at the time of inspection, except that, upon request of the person giving such notice, his name and the names of individual employees referred to therein shall not appear in such copy or on any record published, released, or made available pursuant to subsection (g) of this section. If upon receipt of such notification the Secretary determines there are reasonable grounds to believe that such violation or danger exists, he shall make a special inspection in accordance with the provisions of this section as soon as practicable to determine if such violation or danger exists. If the Secretary determines there are no reasonable grounds to believe that a violation or danger exists, he shall notify the employees or representative of the employees in writing of such determination.</p> <p><b>NOTE:</b> Section 11(c) of the Act provides explicit protection for employees exercising their rights, including making safety and health complaints.</p>	
<b>For Federal Employees:</b>	
This report format is provided to assist Federal employees or authorized representatives in registering a report of unsafe or unhealthful working conditions with the U.S. Department of Labor. The Secretary of Labor may conduct unannounced inspection of agency workplaces when deemed necessary if an agency does not have occupational safety and health committees established in accordance with Subpart F, 29 CFR 1960; or in response to the reports of unsafe or unhealthful working conditions upon request of such agency committees under Sec. 1-3, Executive Order 12196; or in the case of a report of imminent danger when such a committee has not responded to the report as required in Sec. 1-201(h).	
<b>Instructions:</b>	
<p>Open the form and complete the front page as accurately and completely as possible. Describe each hazard you think exists in as much detail as you can. If the hazards described in your complaint are not all in the same area, please identify where each hazard can be found at the worksite. If there is any particular evidence that supports your suspicion that a hazard exists (for instance, a recent accident or physical symptoms of employees at your site) include the information in your description. If you need more space than is provided on the form, continue on any other sheet of paper. After you have completed the form, return it to your local OSHA office.</p> <p><b>NOTE:</b> It is unlawful to make any false statement, representation or certification in any document filed pursuant to the Occupational Safety and Health Act of 1970. Violations can be punished by a fine of not more than \$10,000. or by imprisonment of not more than six months, or by both. (Section 17(g))</p>	
<p>Public reporting burden for this collection of information is estimated to vary from 15 to 25 minutes per response with an average of 17 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of IRM Policy, Department of Labor, Room N- 3101, 200 Constitution Avenue, N.W., Wash., D.C. 20210; and to the Office of Management and Budget, Paperwork Reduction Project (1218-0064), Wash., D.C. 20503.</p> <p><b>DO NOT SEND THE COMPLETED FORM TO EITHER OF THESE OFFICES</b></p>	

U. S. Department of Labor Occupational Safety and Health Administration

**Notice of Alleged Safety or Health Hazards**

	Complaint Number	
Establishment Name		
Site Address	Site Phone	Site Fax
Mailing Address	Mail Phone	Mail Fax
Management Official:	Telephone	
Type of Business		
<p><b>HAZARD DESCRIPTION/LOCATION.</b> Describe briefly the hazard(s) which you believe exist. Include the approximate number of employees exposed to or threatened by each hazard. Specify the particular building or worksite where the alleged violation exists.</p>		
Has this condition been brought to the attention of <input type="checkbox"/> Employer <input type="checkbox"/> Other Government Agency		
Please indicate your desire: <input type="checkbox"/> Do NOT reveal my name to my Employer <input type="checkbox"/> My name may be revealed to my Employer		
The Undersigned believes that a violation of _____ (Mark "X" in ONE box) an Occupational Safety or Health standard exists which is a job safety or health hazard <input type="checkbox"/> Employee <input type="checkbox"/> Federal Safety and Health Committee at the establishment named on this form. <input type="checkbox"/> Representative of Employees <input type="checkbox"/> Other (specify)		
Complainant Name	Telephone Number	
Address		
Signature	Date	
If you are an authorized representative of employees affected by this complaint, please state the name of the organization that you represent and your title:		
Organization Name:	Your Title:	



# BRINK CONSTRUCTORS INC.

## EMPLOYEE SAFETY SUGGESTION AND REPORT OF UNSAFE CONDITION FORM

To submit a safety suggestion or report an unsafe condition, complete this form and forward it to your immediate supervisor. The condition will be evaluated by the supervisor and the form will then be forwarded to the Safety Department for further review and investigation.

1. Name of Employee (Optional): \_\_\_\_\_
2. Date of Safety Suggestion or Report: \_\_\_\_\_
3. Location of Condition Perceived as Unsafe: \_\_\_\_\_  
\_\_\_\_\_
4. Date and Time of Unsafe Condition Observed: \_\_\_\_\_
5. Description of Unsafe Condition: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
6. Name of Person Investigating Unsafe Condition: \_\_\_\_\_
7. Date of Investigation: \_\_\_\_\_
8. Findings of Investigation: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. Action Taken to Correct Unsafe Condition OR Information Provided to Employee As To Why Condition Was Not Unsafe: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
10. Signature of Investigator: \_\_\_\_\_
11. Date of Response to Employee: \_\_\_\_\_

**It is illegal for an employer to take action against any employee for exercising his/her right to communicate unsafe conditions**

# BRINK CONSTRUCTORS INC.

## NOTICE OF SAFETY INFRACTION

Date	Time	Supervisor	Signature
Location			
Employee	Project #		

### PROCEDURES/WORK PRACTICE

1. Work Area Protection  
 Vests, Cones, Signs, Barricades, Flagging

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

2. Personal Protective Equipment  
 Head, Eye, Ear, Foot, Hand, Clothing

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

3. Tail Board Conference or Job Hazard Analysis

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

4. Fall Protection - Harness/Lanyard

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

5. Trenching/shoring, Confined Space

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

6. Grounding  
 Grounds tested, Proper Methods/Size

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

### TOOLS & EQUIPMENT

7. Climbing Equipment  
 Safety Straps, Body Belt Climbers & Straps, Gaff Guards, Ladders

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

8. Rigging Equipment  
 Hoists, Grips, Slings, Hand Lines, Gins, Blocks, etc.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

9. Vehicle(s)  
 Checked, Daily Log, Tools, Winch Lines, Seat Belts, Lights, Fire Ext.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
 Comments \_\_\_\_\_

10. Miscellaneous Tools & Equipment  
 Power Tools, Hot Sticks, Cords

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1st	2nd	3rd	4th

Comments \_\_\_\_\_  
Comments \_\_\_\_\_

11. Ladders - Visual Inspection

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

1st                      2nd                      3rd                      4th

Comments \_\_\_\_\_  
Comments \_\_\_\_\_

12. Other

Clearances, Proper Covering

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------	--------------------------

1st                      2nd                      3rd                      4th

Comments \_\_\_\_\_  
Comments \_\_\_\_\_

Other Comments: \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# BRINK CONSTRUCTORS, INC

## DAILY CRANE INSPECTION CHCKLIST

Project Name:		Project Location:	
Inspected by:	Date:	Manufacturer:	
Equipment #:		Serial #:	

**HOOK:**

PASS      FAIL

- |                                      |   |   |
|--------------------------------------|---|---|
| 1. Throat opening less than 15%.     | — | — |
| 2. Hook is straight and NOT twisted. | — | — |
| 3. Less than 10% wear at the throat. | — | — |
| 4. There are no cracks or corrosion. | — | — |

**WEDGE SOCKETS:**

- |   |   |   |
|---|---|---|
| 1. Wire rope size and wedge socket is a proper match.                   | — | — |
| 2. Dead end of wire rope extends at least 9 inches beyond wedge socket. | — | — |
| 3. Dead end of the wire rope is secured properly.                       | — | — |

**SHEAVES:**

- |  |   |   |
|--|---|---|
| 1. The wire rope is seated properly in the sheaves.                      | — | — |
| 2. The wire rope keepers (keeps cable in the sheaves) are in good shape. | — | — |
| 3. Check the bolts on the sheave plates for tightness.                   | — | — |
| 4. Check for any weld cracks.  | — | — |
| 5. Signs of bent or buckled panels or parts.                             | — | — |

**BOOM:**

- |  |   |   |
|--|---|---|
| 1. Check for hydraulic leaks.                                  | — | — |
| 2. Check all 4 sides of boom for bent parts or buckled panels. | — | — |
| 3. Lattice boom extension is secured properly.                 | — | — |
| 4. Lattice sections are not bent (each rib is straight).       | — | — |

**TIRES:**

- |   |   |   |
|---|---|---|
| 1. Properly inflated (look on load charts for Manufacturer's recommendations) | — | — |
| 2. Tires are free of cuts or bulges.  | — | — |

**FLUIDS:**

- |                                       |   |   |
|---------------------------------------|---|---|
| 1. Crank case oil is clean and full.  | — | — |
| 2. Water is about 2 inches below cap. | — | — |
| 3. Check hydraulic oil level.         | — | — |

**MISCELLANEOUS:**

- |  |     |     |
|--|-----|-----|
| 1. Outrigger pads not cracked.                                 | ___ | ___ |
| 2. Hydraulic hoses in good condition.                          | ___ | ___ |
| 3. The drum cable is properly spooled.                         | ___ | ___ |
| 4. Handrails leading into crane cab are good.                  | ___ | ___ |
| 5. Fire extinguisher is available.                             | ___ | ___ |
| 6. Load chart is in cab.                                       | ___ | ___ |
| 7. Boom angle indicator is available and working properly.     | ___ | ___ |
| 8. Back alarm is working.                                      | ___ | ___ |
| 9. Engine is started and gauges are checked, working properly. | ___ | ___ |
| 10. Outriggers are extended out, working properly.             | ___ | ___ |
| 11. Crane is leveled, working properly.                        | ___ | ___ |
| 12. Safety pressure relief valves check out.                   | ___ | ___ |
| 13. Brakes & brake systems check out.                          | ___ | ___ |
| 14. Horn is functional.  | ___ | ___ |
| 15. Does boom swing break work properly?                       | ___ | ___ |
| 16. Extend out the boom: Are all sections extending evenly?    | ___ | ___ |

## Limited Approach Boundary

<b>Nominal system voltage range, phase to phase</b>	<b>Exposed movable conductor</b>	<b>Exposed fixed-circuit part</b>	<b>Restricted approach boundary (allowing for accidental movement)</b>	<b>Prohibited approach boundary</b>
0 to 50 Volts	Not specified	Not specified	Not specified	Not specified
51 to 300 Volts	10 ft. 0 in.	3 ft. 6 in.	Avoid contact	Avoid contact
301 to 750 Volts	10 ft. 0 in.	3 ft. 6 in.	1 ft. 0 in.	0 ft. 1 in.
751 Volts to 15 kV	10 ft. 0 in.	5 ft. 0 in.	2 ft. 2 in.	0 ft. 7 in.
15.1 kV to 36 kV	10 ft. 0 in.	6 ft. 0 in.	2 ft. 7 in.	0 ft. 10 in.
36.1 kV to 46 kV	10 ft. 0 in.	8 ft. 0 in.	2 ft. 9 in.	1 ft. 5 in.
46.1 kV to 72.5 kV	10 ft. 0 in.	8 ft. 0 in.	3 ft. 2 in.	2 ft. 1 in.
72.6 kV to 121 kV	10 ft. 8 in.	8 ft. 0 in.	3 ft. 3 in.	2 ft. 8 in.
138 kV to 145 kV	11 ft. 0 in.	10 ft. 0 in.	3 ft. 7 in.	3 ft. 1 in.
161 kV to 169 kV	11 ft. 8 in.	11 ft. 8 in.	4 ft. 0 in.	3 ft. 6 in.
230 kV to 242 kV	13 ft. 0 in.	13 ft. 0 in.	5 ft. 3 in.	4 ft. 9 in.
345 kV to 262 kV	15 ft. 4 in.	15 ft. 4 in.	8 ft. 6 in.	8 ft. 0 in.

**BRINK CONSTRUCTORS INC.**

**FORKLIFT OPERATOR'S DAILY CHECKLIST**

Date of Inspection: \_\_\_\_\_

Truck ID#: \_\_\_\_\_

Location of Truck: \_\_\_\_\_

Hour Meter Reading: \_\_\_\_\_

Operator: \_\_\_\_\_

Supervisor (sign): \_\_\_\_\_

Before beginning operation of the truck, check each item below. Notify the supervisor of any items that require maintenance and remove the truck from service until repairs complete.

Cross out any item that does not apply to the truck being inspected. Explain problems noted below or describe additional problems on back of this sheet.

PASS	FAIL	<u>KEY OFF / VISUAL CHECKS</u>
		<b>Overhead Guard:</b> damaged, loose or missing
		<b>Hydraulic Cylinders:</b> damaged, leaking
		<b>Mast/Carriage Assembly:</b> damaged, loose or missing parts, excessive wear, leaks
		<b>Lift Chains and Roller:</b> damaged, uneven chain tension.
		<b>Forks:</b> damaged, bent, worn.
		<b>Tires and Wheels:</b> damaged, worn, loose.
		<b>LP Gas Tank and Hose (LP gas trucks only):</b> tank secure, hose damage, leaks, gas odor.
		<b>Seat and Seat Belts:</b> damaged, loose or missing?
		<b>Warning Decals/Operators Manual:</b> missing and not readable?
		<b>Data Plate/Load Chart:</b> missing or not readable?
		<b>Battery:</b> properly installed, caps and cables tight and undamaged, charged, proper fluid level.
		<b>Gauges and Instruments:</b> damaged or missing.
		<b>Engine Oil:</b> check level, dirty, leaks.
		<b>Engine Coolant:</b> check level, leaks.
		<b>Transmission Fluid:</b> check level, leaks.
		<b>Hydraulic Fluid:</b> check level, leaks.

PASS	FAIL	<u>KEY ON / OPERATING CHECKS</u>
		<b>Lights-Front/Tail/Brake:</b> operating properly?
		<b>Gauges:</b> Operating properly?
		<b>Mast:</b> lifts and lowers smoothly, chains and rollers operate properly, excess noise, fluid leaks.
		<b>Carriage and Attachments:</b> tilts forward and backward smoothly, excess noise, leaks.
		<b>Steering:</b> works properly, excess free play, leaks.
		<b>Horn:</b> does it works properly?
		<b>Control levers:</b> operate properly, loose or binding, returns to center freely.
		<b>Directional/Speed Control:</b> operates properly, loose or binding, returns to neutral freely.
		<b>Drive Axle:</b> noise, lubricant leaks
		<b>Service Brakes:</b> does truck stop properly in forward and reverse?
		<b>Parking Brake:</b> can the truck move with the brake applied?
		<b>Back-up Alarm (if equipped):</b> does it work?
		<b>Battery Check (electric trucks):</b> does battery show full charge under load?
		<b>Safety Door and Switch (if equipped):</b> in place and working properly?
		<b>Work Platform (if equipped):</b> does platform raise and lower smoothly?



## ANNUAL FALL PROTECTION EQUIPMENT INSPECTION CHECKLIST

<b>Equipment Inspected:</b>	<b>Inspector:</b>	<b>Date:</b>
-----------------------------	-------------------	--------------

### Safety Belt and Harness Inspection

Visual inspections of fall protection equipment shall be conducted before each use. If any defects described in this checklist are found, the equipment must not be used. Beginning at one end and holding the body side of the belt/harness toward you, grasp the belt with your hands, placing them six to eight inches apart. Bend the belt into an inverted “U” and examine the surface for damaged or broken fibers, pulled stitches, cuts, abrasions or chemical damage. **FOLLOW THIS PROCEDURE ALONG THE ENTIRE LENGTH ON THE INSIDE AND OUTSIDE OF THE BELT/HARNES.**

ITEM	CONDITION	PASS	FAIL
1	Inspect for frayed or broken strands. Broken webbing strands appear as tufts on the webbing surface. <b>Check for thread separation or rotting both inside as well as outside of the body pad.</b>	<input type="checkbox"/>	<input type="checkbox"/>
2	Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. The roller should turn freely on frame. <b>Check for distortion or sharp edges.</b>	<input type="checkbox"/>	<input type="checkbox"/>
3	The tongue or billet of the belts receives heavy wear from repeated buckling and unbuckling. Inspect for loose, distorted or broken grommets. Belts using punched holes without grommets should be checked for torn or elongated holes causing slippage of the buckle tongue. <b>Check for excessive elongation or distortion.</b>	<input type="checkbox"/>	<input type="checkbox"/>
4	Rivets should be tight and unmovable with fingers. Body site rivet base and outside rivet burr should be flat against the material. <b>Bent rivets will fail under stress.</b>	<input type="checkbox"/>	<input type="checkbox"/>
5	Note the condition of “D” ring rivets and “D” ring metal wear pads (if any). <b>Discolored, pitted or cracked rivets indicated chemical corrosion.</b>	<input type="checkbox"/>	<input type="checkbox"/>
6	Friction buckles must be inspected for distortion. The outer bars and center bars must be straight. Pay special attention to corners and attachment points of the center bar.	<input type="checkbox"/>	<input type="checkbox"/>
7	Sliding bar buckles must have the buckle frame and sliding bar inspected for cracks, distortion and sharp edges. The sliding bar should move freely. The knurled edge will slip if worn smooth. Inspect the corners and ends of the sliding bar carefully.	<input type="checkbox"/>	<input type="checkbox"/>

**NEVER CUT OR PUNCH ADDITIONAL HOLES IN THE STRAP OR STRENGTH MEMBERS**

### Safety Strap, Lanyard and Hardware Inspection

Only use snaps and “D” rings which are compatible with each other. When inspecting lanyards, begin at one end and work to the opposite end. Slowly rotate the lanyard so that the entire circumference is checked.

ITEM	CONDITION	PASS	FAIL
1	Inch by inch visual inspection for fiber laceration or stitch damage is done by flexing the strap in an inverted “U”.	<input type="checkbox"/>	<input type="checkbox"/>
2	<b>Strap buckles shall be inspected in the same manner as waist belt/harness buckles.</b> (Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. The roller should turn freely on frame. <b>Check for distortion or sharp edges.</b> )	<input type="checkbox"/>	<input type="checkbox"/>
3	Snap hooks shall be checked for distortion of the hook or frame attachment to the belt. The keeper (latch) should seat into the snap nose without binding or obstruction and the keeper spring should have sufficient force to close the keeper firmly.	<input type="checkbox"/>	<input type="checkbox"/>
4	The thimble must be movable in the eye of the splice and the splice shall have no loose or cut strands. The thimble must be free of sharp edges, distortion or cracks.	<input type="checkbox"/>	<input type="checkbox"/>
5	All rivets shall be tight, free of distortion or wear and without cracks, sharp edges or corrosion.	<input type="checkbox"/>	<input type="checkbox"/>
6	Inspect wire rope lanyards for cuts or broken strands and unusual wearing patterns.	<input type="checkbox"/>	<input type="checkbox"/>
7	Inspect fiber rope lanyards for weakened areas by examining changes in the original diameter.	<input type="checkbox"/>	<input type="checkbox"/>
8	Inspect closely the forged steel “D” rings for cracks or other defects. Inspect the assembly of the “D” rings to the body pad or “D” ring saddle. <b>If the “D” ring can be moved vertically, independent of the body pad or “D” saddle, the belt should be replaced. The “D” ring bar shall be at a 90 degree angle with the long axis of the belt and should pivot freely.</b>	<input type="checkbox"/>	<input type="checkbox"/>

#### Webbing Inspection

Type of webbing	Heat	Chemical	Molten Metal or Flame	Paint or Solvents
Cotton	Scorches at 200 degrees to 250 degrees F, and turns a yellow color. Turns brown at 285 degrees F and is destroyed.	Changed in color depend on chemical exposure. Changes to light color or turns brown. Fibers may break when pulled or stressed.	Charred black marks or brown pockmarks. Holes through the webbing.	Paint which has saturated the webbing causing hardening and fiber breaks. Paints containing lead will attack webbing fibers.
Nylon and Cordura	In excessive heat nylon becomes brittle and has a shriveled, brownish appearance. The fibers will break when flexed. Should not be used above 200 degrees F.	Change in color usually appearing as a brownish smear or smudge. Transverse cracks when the belt is bent over. Loss of elasticity.	Webbing strands fuse together. Hard shiny spots which are brittle. Will not support combustion.	Paint which penetrates and dries restricts movement of fibers. Drying agents and solvents in some paints will appear as chemical damage.
Polyester, Dacron	Same as nylon except do not use above 180 degrees F.	Same as nylon.	Same as nylon except will support combustion.	Same as nylon.

# BRINK CONSTRUCTORS INC.

## Hazard Communication Training Record

Employee Name: \_\_\_\_\_ Date: \_\_\_\_\_

Discussed and Trained in the Following Items:

Discussed the Hazard Communication Standard, including BCI's rights and employees' rights under the law.

Discussed definitions of Physical and Health hazards of chemicals in our workplace.

Reviewed Hazard Chemicals List, including availability and use.

Use, availability and interpretation of MSDS's.

Reviewed labeling requirements including how-to, when, importance, checking-in materials and cross-referencing.

Reviewed methods of controlling workplace exposures.

Reviewed hazardous chemical handling procedures.

Reviewed Emergency Action Plan

Employee agrees to cooperate fully with the safety efforts of the employer, follow all safety rules and use good judgment concerning safe work behavior.

Remarks:

---

---

---

---

---

Signed: \_\_\_\_\_  
Employee

Signed: \_\_\_\_\_  
Supervisor

# BRINK CONSTRUCTORS INC.

## HEARING CONSERVATION PROGRAM

### TRAINING RECORD

**FROM:** \_\_\_\_\_

Manager or Supervisor

The employee listed below recently was found to have a confirmed significant shift in the hearing threshold (as defined by OSHA). An investigation and additional training is required. When this form is completed and reviewed with the employee, please file in the office.

**EMPLOYEE NAME:** \_\_\_\_\_

Print or type First, MI, Last Name

\_\_\_\_\_  
Social Security Number or Employee Number

\_\_\_\_\_  
Reported Date

**JOB CATEGORY** \_\_\_\_\_

(Current Assignment)

The potential for noise exposure and specific requirements for using hearing protection in their area should be reviewed with this employee within 2 weeks. If hearing protection requirements have not been established in this work area, it must be done as soon as possible.

The retraining for this employee should include:

- \* The temporary and permanent effects of noise on hearing
- \* Established hearing protection requirements
- \* Any questions the employee may have on the use of hearing protection
- \* The proper use of hearing protection
- \* Comments the employee has on potential off-the-job noise exposure

Comments on discussion held: \_\_\_\_\_

I have discussed the above items with this employee:

\_\_\_\_\_  
Manager or Supervisors Name (print)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date of Discussion

# BRINK CONSTRUCTORS INC.

## Energy Control Procedure Form

Department: \_\_\_\_\_ Date: \_\_\_\_\_

Equipment Identification: \_\_\_\_\_

Person Completing This Form: \_\_\_\_\_

Location and Type of Energy Sources

<b>Electrical:</b>	
<b>Mechanical:</b>	
<b>Pneumatic:</b>	
<b>Hydraulic:</b>	
<b>Other:</b>	

Specific Steps to Follow to Complete Lockout

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Special Hazards

# BRINK CONSTRUCTORS INC.

## Lock Removal Procedure Form

Equipment/Machine/Process:

Lock Number:

Authorized Employee Name:

Location:

Consistent with ----- Policy Section 14 – Energy Control – Lockout, only the direct Supervisor of an Authorized Employee shall remove an Energy Control Device (Lock) after all efforts have been made to assure the area in question is clear, the Authorized Employee is not available to remove the lock themselves and this Procedure has been completed.

### Check each item that applies and sign prior to Energy Control Device Removal

- It is absolutely necessary that the equipment/machine/process be re-engaged before the authorized employee can return to personally remove the lock.
- Every attempt has been made to locate the Authorized Employee so they can remove their Energy Control Device (Lock).
- The direct supervisor of the Authorized Employee or a direct designee has personally reviewed the equipment/machine/process to assure the area is clear of people, tools or obstructions.
- The Energy Control Device (Lock) will be removed by the Authorized Employee's direct supervisor or a direct designee only.
- The Authorized Employee acknowledges the lock removal.

\_\_\_\_\_  
Authorized Employee

(whose lock was removed)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Direct Supervisor or (direct) Designee

\_\_\_\_\_  
Date

# BRINK CONSTRUCTORS INC.

## Annual Lockout / Tag out (LOTO) Energy Isolation Inspection Form

Inspection Performed By (The Safety Officer):	
Date:	
Equipment:	
Employees:	
Comments:	
Corrective Actions (if applicable):	

# BRINK CONSTRUCTORS, INC

## PERSONAL PROTECTIVE EQUIPMENT ISSUE

### CONDITIONS OF ISSUE

1. PPE, as listed below, will be issued at the expense of the Company.
2. PPE remains the property of the Company and must be returned within 24 hrs. of separation of employment.
3. Failure to return the PPE will result in the deduction from your pay check for the value of the PPE not returned.
4. Loss or willful damage of PPE may result in disciplinary action being taken against the employee, depending upon the outcome of an investigation. Employee will be issued a replacement but will be charged full value of the item(s).
5. I will immediately report to supervision if PPE issued to me is lost or damaged.
6. I will wear/use PPE issued to me whenever needed and/or required to do so.
7. I understand that refusal to wear/use issued PPE as required by law and/or Company policy may result in disciplinary action taken against me, up to and including termination.
8. I have received training on the use, care and limitations of PPE.

I understand and accept the Conditions of Issue stated above.

EMPLOYEE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

DATE: \_\_\_\_\_

### PPE CHECKLIST

RATE OF ISSUE	ITEM	DATE ISSUED	DATE RETURNED	ITEM COST (ea)
1 every 5 yrs	<b>(M) HARD HAT</b>			\$35
1 per year	<b>(M) SAFETY GLASSES</b>			\$15
5 per year	<b>(M) FR LONG SLEEVE SHIRT</b>			\$55
1 per year	<b>(M) REFLECTIVE TRAFFIC VEST</b>			Class II - \$15, Class III- \$20
1 per year	SAFETY GOGGLES			\$8
1 set every 3 yrs.	HEARING PROTECTION (Formed EAR Plugs)			\$15
1 set every 3 yrs.	HEARING PROTECTION (EAR MUFFS)			\$25
1 every 5 yrs.	BODY HARNESS			REG-\$150, ARC-\$300
1 every 5 yrs.	SHOCK LANYARD			REG-\$56, ARC-\$92

\*NOTE – ITEMS DESIGNATED **(M)** ARE MANDATORY-ISSUE AND REMAINING ITEMS ARE ISSUED ON AS-NEEDED BASIS.



# BRINK CONSTRUCTORS, INC

## PROJECT SAFETY CHECK LIST

### Location of nearest Hospital

\_\_\_\_\_

Hospital name \_\_\_\_\_

Hospital address \_\_\_\_\_

Hospital telephone \_\_\_\_\_

### Location of nearest Doctor

Doctor's name Multiple \_\_\_\_\_

Doctor's address \_\_\_\_\_

Doctor's telephone \_\_\_\_\_

### Location of nearest Ambulance Service

Ambulance Service Name \_\_\_\_\_

Ambulance Service Area \_\_\_\_\_

Ambulance Service Telephone \_\_\_\_\_

Police \_\_\_\_\_

Sheriff \_\_\_\_\_

Fire Department \_\_\_\_\_

Check fire extinguisher monthly. Date and sign tag.

Check first aid kits weekly.

Post safety and health protection on the job, in the project office or shop, where all employees can readily see it.

Is OSHA Form 300 in the project office?

Are Accident Report Forms in the project office? These forms must comply with OSHA Form 301.

**POST THIS SAFETY POLICY AND SAFETY CHECK LIST IN THE PROJECT OFFICE OR SHOP WHERE ALL EMPLOYEES CAN READILY SEE IT.**

## Major Fire Hazards – Rapid City Office

Name of Fuel Source	Quantity Stored on Premises	Location	Type of Fire Protection or Extinguisher	Special Instructions
Unleaded Gasoline	8000 gallons	NW corner of property	Double-wall tanks, leak detection with alarms	In event of fire, call 911. Do not attempt to extinguish.
Diesel Fuel	8000 gallons	NW corner of property	Double-wall tanks, leak detection with alarms	In event of fire, call 911. Do not attempt to extinguish.

### Flammable Waste

Name of Waste	Quantity Stored on Premises	Location	Methods of Handling, Packaging & Disposal
None stored			

### Ignition Sources

Ignition Source	Location	Method used to Control
Furnace	SE corner of upper storage	Isolation from flammables and mechanical safeguards
Welding	Shop area	Proper welding and cutting techniques and safeguards



# Wind Chill Chart



		Temperature (°F)																	
Calm		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times  30 minutes  10 minutes  5 minutes

**Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V<sup>0.16</sup>) + 0.4275T(V<sup>0.16</sup>)**  
 Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

# NOAA's National Weather Service

## Heat Index

Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

### Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution
  Extreme Caution
  Danger
  Extreme Danger

# HYDROGEN SULFIDE (H<sub>2</sub>S)

## Concentration Levels    Short Term Effects

- 0.13 ppm      Threshold of odor detection
- 0.77 ppm      Faint, but readily perceptible odor
- 4.6 p p m      Easily noticeable odor
- 10 ppm \*\*      Eye irritation, soreness, redness, burning
- 27 ppm          Strong, unpleasant, but not intolerable odor
- 50 ppm          Irritation & dryness of nose, throat, and airways. Cough, shortness of breath, pneumonia
- 100 ppm        Immediate irritation of eyes and respiratory tract
- 150 ppm        Sense of smell may be paralyzed
- 200 ppm        Headaches, dizziness, nausea
- 500 ppm        Unconsciousness and death within a few minutes. May be no warning odor
- 1000 ppm       Immediate loss of consciousness and respiratory paralysis leading to death

\*\* NOTE: Concentration levels from 10-50 ppm may be tolerable without immediate symptoms. However, the onset of eye and perhaps respiratory irritation may occur several hours or even days after initial exposure. Most eye and respiratory diseases occur at these exposure levels because of the delayed effects.

The potential for release of life threatening concentrations of hydrogen sulfide gas into the atmosphere where "sour" oil and gas operations are conducted is well known in the petroleum drilling, transporting and refining industries. Employers involved in transporting "sour" crude oils from production well sites to pipelines are required to manually gauge storage tanks before and after each transfer in accordance with industry established (i.e. American Petroleum Institute) procedures. As these storage tanks are located outside at remote locations, a single employee is dispatched to perform the necessary gauging on a regular basis (gauging schedules vary depending on when transfers are made from individual storage tanks). Tank gauging requires an employee to climb to the top of the storage tank, open a thief hatch, and determine the tank level by means of a plumb bob. Crude oil temperature and specific gravity readings may also be taken at this time, which would involve taking a sample from the tank and/or reading a gauge. Normally, the entire procedure takes approximately five to ten minutes.

29 CFR 1910.1000(b)(2) which requires that an employee's exposure to any substance listed in Table Z-2 shall not exceed at any time the acceptable ceiling concentration limit, except for a time period and up to a concentration not exceeding the maximum duration and concentration allowed in the acceptable maximum peak column. The example given in 1910.1000(b)(3) states that "...an employee may be exposed to a concentration of Substance A (with a 10 ppm TWA, 25 ppm ceiling and 50 ppm peak) above 25 ppm (but never above 50 ppm) only for a maximum period of 10 minutes."

Hydrogen sulfide can be a severe acute hazard, and in reviewing the USA Standard Z 37.2-1966 it was noted that hydrogen sulfide is an extremely toxic and irritating gas and a significant property of the gas is its temporary paralytic effect on the olfactory nerve. High concentrations can result in severe consequences before the odor is detected. Sampling methods are currently available and should be used for measuring both the 10 minute and instantaneous levels of hydrogen sulfide in the workplace.

# BRINK CONSTRUCTORS, INC

## MONTHLY LADDER INSPECTION CHECKLIST

### INSPECTION

Date of Inspection:	Name of Inspector:
Department:	Ladder Identification Number:
Type of Ladder: ( ) Extension ( ) Step ( ) Fixed	
Construction of Ladder: ( ) Wood ( ) Metal ( ) Fiberglass	

### MONTHLY INSPECTION

	YES	NO
1. Are rungs, cleats or steps intact and free of damage?	YES	NO
2. Are rails free from cracks or splitting?	YES	NO
3. Is the ladder free from accumulations of oil, grease or other material that may create a slipping hazard?	YES	NO
4. Is the ladder free from protruding objects that could cause injury?	YES	NO
5. If ladder is equipped with safety device, is the device secured and operating properly on the ladder?	YES	NO
6. If ladder is equipped with locking device, is device intact and fully functional?	YES	NO
7. If fixed ladder is equipped with cages, are cages intact and free of broken welds?	YES	NO
8. Is the ladder free from any other defects that may impair or prevent safe usage?	YES	NO

### COMMENTS

Date ladder was repaired and returned to service:	Repaired by:
---	--------------

# INSTRUCTIONAL PROCEDURES

## B. Hoisting Signals

Demonstrate and explain each of the following:



**STOP**



**BOOM UP**



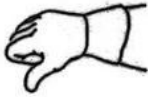
**MOVE LOAD VERY SLIGHTLY**



**USE WHIP LINE**



**EMERGENCY STOP**



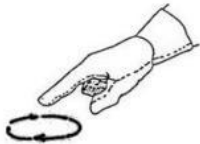
**BOOM DOWN**



**MOVE SLOWLY**



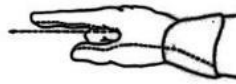
**USE BURDEN BLOCK**



**LOWER LOAD**



**BOOM UP AND LOWER LOAD**



**SWING OR HOUSE**



**CUT THE LOAD OFF**



**HOIST LOAD**



**BOOM UP AND RAISE LOAD**



**TRAVEL FORWARD**



**TRAVEL BACKWARD**

# Slings Inspection

## INSPECTION AND REPLACEMENT PER ANSI B30.9

### INSPECTION

All slings shall be visually inspected by the person handling the sling each day they are used. In addition, recorded periodic inspection must be done annually.

- Distortion of the rope in the sling such as kinking, crushing, unstranding, birdcaging, main strand displacement or core protrusion. Loss of rope diameter in short rope lengths or unevenness of outer strands should provide evidence the sling should be replaced.
- General corrosion.
- Broken or cut strands.
- Number, distribution, and type of visible broken wires.

### REPLACEMENT

Condition such as the following should be sufficient reason for consideration of sling replacement.

- For strand laid and single part slings, ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay.
- Severe localized abrasion or scraping.
- Kinking, crushing, birdcaging, or any other damage resulting in distortion of the rope structure.
- Evidence of heat damage.
- End attachments that are cracked, deformed, or worn to the extent that the strength of the sling is substantially affected.
- Hooks should be inspected in accordance with ANSI B30.10
- Severe corrosion of the rope or end attachments.

### MULTI - PART REMOVAL CRITERIA FOR CABLE AND BRAIDED SLINGS

Slings Body	Allowable Broken Wire Per Lay or One Braid	Allowable Broken Strands per Slings Lay
Less than 8 per Braid	20	1
Cable Laid	20	1
8 Parts and more	40	1

### WEB SLING

#### INSPECTION AND REMOVAL FROM SERVICE PER ANSI B30.9

**FREQUENT INSPECTION** - This inspection shall be made by the person handling the sling each day the sling is used.

**PERIODIC INSPECTION** - Written records are required.

This inspection should be conducted by designated personnel, frequency of the inspection should be based on the following:

1. Frequency of sling use.
2. Severity of service conditions
3. Experience gained on the service life of sling used in similar applications.
4. At least annually.

#### REMOVAL CRITERIA

1. Acid or caustic burns.
2. Melting or charring of any part of the sling.
3. Broken, tears, cuts, or snags.
4. Broken or worn stitching in load bearing splices.
5. Excessive abrasive wear.
6. Knots in any part of the sling.
7. Excessive pitting or corrosion, or cracked, distorted, or broken fittings.
8. Other visible damage that causes doubts as to the strength of the sling.



### INSPECTION OF SYNTHETIC WEB SLINGS ASME B30.9C 1994

#### Type of Inspection

- a. **Frequent inspection** - This inspection should be made by the person handling the sling each day the sling is used
- b. **Periodic inspection** - This inspection should be conducted by designated personnel. Frequency of inspection should be based on:
  1. Frequency of sling use
  2. Severity of service conditions
  3. Experience gained on the service life of slings used in similar applications.
 Periodic inspection should be conducted at least annually.

**Inspection Records.** Written inspection records, utilizing the identification for each sling as established by the user, should be kept for all slings. These records should show a description of the new sling and its condition on each periodic inspection.

**Removal Criteria.** A sling shall be removed from service if damage such as the following is visible and shall only be returned to service when approved by a designated person.

- a. Acid or charring burns
- b. Melting or charring of any parts of the sling
- c. Holes, tears, cuts or snags
- d. Broken or worn stitching in load bearing splices
- e. Excessive abrasive wear
- f. Knots in any parts of the sling
- g. Excessive pitting or corrosion, or cracked, distorted or broken fittings
- h. Other visible damage that causes doubt as to the strength of the sling.

### OPERATION OF SYNTHETIC WEB SLING ASME B30.9C 1994

#### Operating Practices

- ✓ Slings having suitable characteristic for the type of load, hitch and environment shall be selected in accordance with appropriate table.
- ✓ The weight of load shall be within the rated load of the sling.
- ✓ Slings shall be shortened, lengthened, or adjusted only by methods approved by the sling manufacturer.
- ✓ Slings shall not be shortened or lengthened by knotting.
- ✓ Sharp corners in contact with the sling should be padded with material of sufficient strength to minimize damage to the sling.
- ✓ Portions of the human body should be kept from between the sling and the load, and from between the sling and the crane hook or hoist hook.
- ✓ Personnel should stand clear of the suspended load.
- ✓ Personnel shall not ride the sling.
- ✓ Shock loading should be avoided.
- ✓ Slings should not be pulled from under a load when the load is resting on the sling.
- ✓ Slings should be stored in a cool, dry, and dark place to prevent environmental damage.
- ✓ Twisting and kinking the legs shall be avoided.
- ✓ Load applied to the hook should be centered in the base (bowl) of hook to prevent point loading on the hook.
- ✓ During lifting, with or without load, personnel shall be alert for possible snagging.
- ✓ In a basket hitch, the load should be balanced to prevent slippage.
- ✓ The sling's legs should contain or support the load from the sides above the center of gravity when using a basket hitch.
- ✓ Slings should be long enough so that the rated load is adequate when the angle of the legs is taken into consideration.
- ✓ Slings should not be dragged on the floor or over an abrasive surface.
- ✓ In a choker hitch, slings shall be long enough so the choker fitting chokes on the webbing and never on the other fittings.
- ✓ Nylon and polyester slings shall not be used at temperatures in excess of 194° F (90°C), or a temperature below -40°F (-40°C).
- ✓ When extensive exposure to sunlight or ultraviolet light is experienced by nylon or polyester web slings, the sling manufacturer should be consulted for recommended inspection procedures.

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# Inspection of Fittings

## INSPECTION OF FITTINGS



- WEAR
- DEFORMATION
- CRACKS OR SHARP NICKS
- MODIFICATION
- WIRE ROPE AT TERMINATION

ABNORMAL



### INSPECTION OF FITTINGS DEFORMATION

ANY SIGNIFICANT PERMANENT DEFORMATION, OR CHANGE IN SHAPE, INDICATES IT HAS BEEN OVERLOADED AND MUST BE REMOVED FROM SERVICE

NORMAL



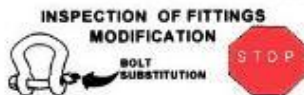
### INSPECTION OF FITTINGS WEAR

NO MORE THAN 10% WEAR OF ANY SECTIONAL DIMENSION, MEASURE BY COMPARING TO A SECTION OF FITTING THAT HAS NO WEAR, OR TO THE CATALOG DIMENSIONS

### INSPECTION OF FITTINGS CRACKS AND SHARP NICKS



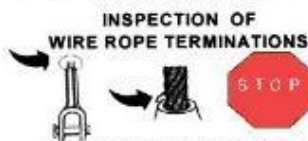
ANY CRACK, SHARP NICK OR GOUGE IN THE SURFACE OF ANY FITTING IS CAUSE FOR REMOVAL FROM SERVICE



### INSPECTION OF FITTINGS MODIFICATION

BOLT SUBSTITUTION

ANY MODIFICATION OF ANY FITTING IS CAUSE FOR REMOVAL FROM SERVICE: WELDING OR HEATING NO SUBSTITUTION OF PARTS NO BENDING



### INSPECTION OF WIRE ROPE TERMINATIONS

MORE THAN ONE BROKEN WIRE AT ANY (WITHIN ONE WIRE ROPE DIAMETER OF THE FITTING) TERMINATION IS CAUSE FOR REMOVAL FROM SERVICE

The inspection of fittings:

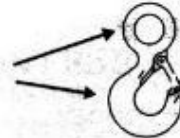
1. Initial, upon purchase
2. Frequent, prior to each use
3. Periodic, at least annually

More frequent inspection is required if type of service requires it. Records are not required by federal OSHA unless fittings are part of chain sling.

OSHA and ANSI allow 15% increase in throat opening of hooks, however Crosby recommends that hooks be removed from service if any significant deformation exists.



Wear of hook is limited to 5% in the two critical areas shown.



Cracks can form if a properly made fitting is repeatedly overloaded. A crack can form if non heat treated fittings are used in frequently cycled loads that are within the Working Load Limit.

Never modify a shackle by substituting the shackle pin. Use only genuine Crosby shackle pins with Crosby Shackles. All alloy shackles must have pins that are marked with HT.

Any modification will mean that the Working Load Limit is no longer valid. The person modifying the fitting is responsible.

# Crosby® Forged Shackles



**G-209 S-209**

Screw pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 2, except for those provisions required of the contractor.



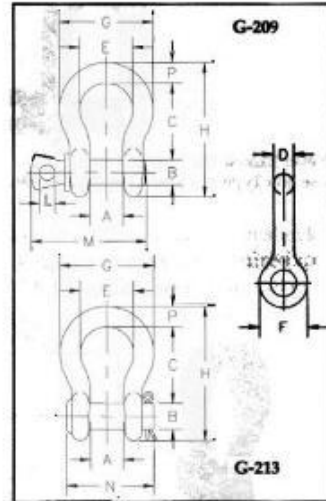
**G-213 S-213**

Round pin anchor shackles meet the performance requirements of Federal Specification RR-C-271D Type IVA, Grade A, Class 1, except for those provisions required of the contractor.

- Working Load Limit permanently shown on every shackle.
- Forged - Quenched and Tempered, with alloy pins.
- Capacities 1/3 thru 55 tons.
- Look for the Red Pin™ . . . the mark of genuine Crosby quality
- Shackles can be furnished proof tested with certificates to designated standards, such as ABS, DNV, Lloyds, or other certification. Charges for proof testing and certification available when requested at the time of order.
- Hot Dip galvanized or Self Colored.
- Fatigue rated.

*Fatigue Rated*

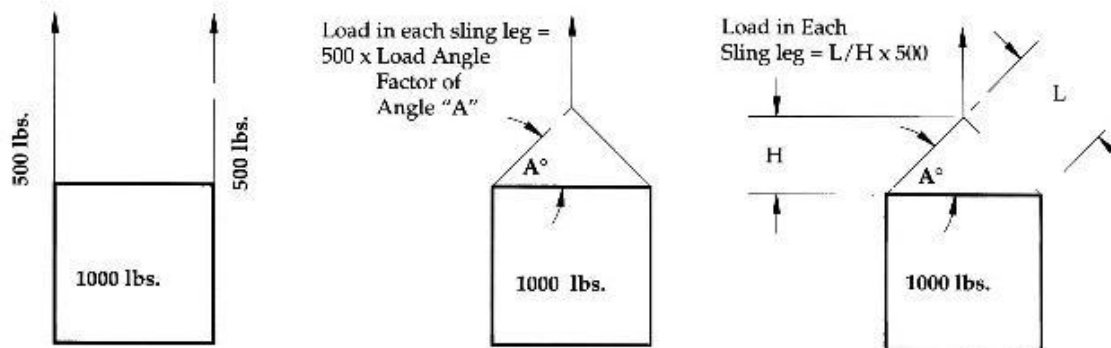
Nominal Size (in.)	Working Load Limit * (tons)	Stock No.				Weight Each (lbs.)	
		G-209 Galv.	S-209 S.C.	G-213 Galv.	S-213 S.C.	G-209 S-209	G-213 S-213
3/16	1/3	1018357	—	—	—	.06	—
1/4	1/2	1018375	1018384	1018017	1018026	.10	.13
5/16	3/4	1018393	1018400	1018035	1018044	.19	.18
3/8	1	1018419	1018428	1018053	1018062	.31	.29
7/16	1 1/2	1018437	1018446	1018071	1018080	.38	.38
1/2	2	1018455	1018464	1018099	1018106	.72	.71
5/8	3 1/4	1018473	1018482	1018115	1018124	1.37	1.50
3/4	4 3/4	1018491	1018507	1018133	1018142	2.35	2.32
7/8	6 1/2	1018516	1018525	1018151	1018160	3.62	3.49
1	8 1/2	1018534	1018543	1018179	1018188	5.03	5.00
1 1/8	9 1/2	1018552	1018561	1018197	1018204	7.41	6.97
1 1/4	12	1018570	1018589	1018213	1018222	9.50	9.75
1 3/8	13 1/2	1018598	1018605	1018231	1018240	13.53	13.25
1 1/2	17	1018614	1018623	1018259	1018268	17.20	17.25
1 3/4	25	1018632	1018641	1018277	1018286	27.78	29.46
2	35	1018650	1018669	1018295	1018302	45.00	45.75
2 1/2	55	1018678	1018687	—	—	85.75	—



Nominal Size (in.)	Working Load Limit * (tons)	Dimensions (in.)												Tolerance +/-	
		A	B	C	D	E	F	G	H	L	M	N	P	C	A
3/16	1/3	.38	.25	.88	.19	.60	.56	.98	1.47	.16	1.12	—	.19	.06	.06
1/4	1/2	.47	.31	1.13	.25	.78	.61	1.28	1.84	.19	1.38	1.34	.25	.06	.06
5/16	3/4	.53	.38	1.22	.31	.84	.75	1.47	2.09	.22	1.66	1.59	.31	.06	.06
3/8	1	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.03	1.86	.38	.13	.06
7/16	1 1/2	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.38	2.13	.44	.13	.06
1/2	2	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	2.38	.50	.13	.06
5/8	3 1/4	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	2.91	.69	.13	.06
3/4	4 3/4	1.25	.88	2.81	.75	2.00	1.81	3.50	4.97	.50	3.97	3.44	.81	.25	.06
7/8	6 1/2	1.44	1.00	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	3.81	.97	.25	.06
1	8 1/2	1.69	1.13	3.75	1.00	2.69	2.38	4.69	6.56	.56	5.07	4.53	1.06	.25	.06
1 1/8	9 1/2	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.59	5.13	1.25	.25	.06
1 1/4	12	2.03	1.38	4.69	1.29	3.25	3.00	5.75	8.25	.69	6.16	5.50	1.38	.25	.06
1 3/8	13 1/2	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.84	6.13	1.50	.25	.13
1 1/2	17	2.38	1.63	5.75	1.54	3.88	3.63	6.88	10.00	.81	7.35	6.50	1.62	.25	.13
1 3/4	25	2.88	2.00	7.00	1.84	5.00	4.19	8.86	12.34	1.00	9.08	7.75	2.25	.25	.13
2	35	3.25	2.25	7.75	2.08	5.75	4.81	9.97	13.68	1.22	10.34	8.75	2.40	.25	.13
		4.13	2.75	10.50	2.71	7.25	5.69	12.87	17.84	1.38	13.00	—	3.13	.25	

# Sling Information

## SLING ANGLES



Sling Angle Degree (A°)	Load Angle Factor = L / H
90	1.000
60	1.155
50	1.305
45	1.414
30	2.000

**LOAD ON EACH LEG OF SLING = (Load ÷ 2) x LOAD ANGLE FACTOR**

ANSI B30.9 recommends against the use of a horizontal sling angle smaller than 30°.

## BASIC SLING OPERATING PRACTICES ANSI B30.9

Whenever any sling is used, the following practices shall be observed.

1. Slings that are damaged or defective shall not be used.
2. Slings shall not be shortened with knots or bolts or other makeshift devices.
3. Sling legs shall not be kinked.
4. Slings shall not be loaded in excess of their rated capacities.
5. Slings used in a basket hitch shall have the loads balanced to prevent slippage.
6. Slings shall be securely attached to their load.
7. Slings shall be padded or protected from the sharp edges of their loads.
8. Suspended loads shall be kept clear of all obstruction.
9. All employees shall be kept clear of loads about to be lifted and of suspended loads.
10. Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.
11. Shock loading is prohibited.
12. A sling shall not be pulled from under a load when the load is resting on the sling.

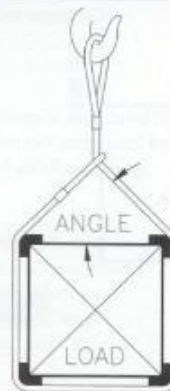
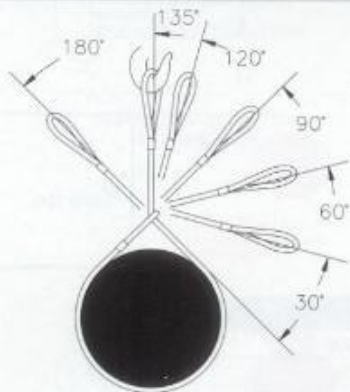
**INSPECTION** - Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use where service conditions warrant. Damaged or defective slings shall be immediately removed from service.

# Sling Information

## CHOKER HITCHES

**CHOKER HITCHES  
WIRE ROPE SLINGS  
ANSI B30.9**

**CHOKER HITCHES  
WIRE ROPE, CHAIN, AND  
SYNTHETIC SLINGS**



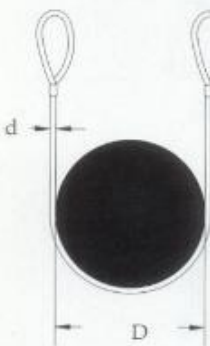
Angle of Choke	Sling Rated Load Percentage of Single Leg Sling Capacity
120 - 180	75%
90 - 119	65%
60 - 89	55%
30 - 59	40%

A choker hitch has 75% (80% for Webbing Slings) of the capacity of a single leg only if the corners are softened and the horizontal angle is greater than 30 degrees. Use blocks to prevent angles less than 30 degrees.

## BASKET HITCHES

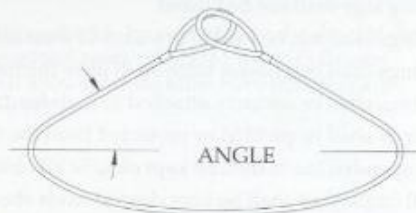
**BASKET HITCH  
WIRE ROPE SLINGS**

**WIRE ROPE, CHAIN  
AND SYNTHETICS**



A basket hitch has twice the capacity of a single leg only if  $D/d$  Ratio is 25/1 and it is vertical.

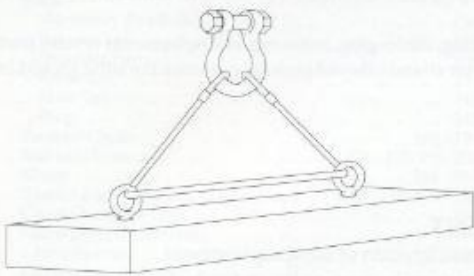
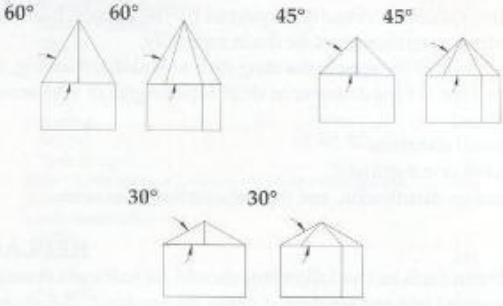
$D/d > 25/1$  per ANSI B30.9



Angle Degrees	Percentage of Single Leg Capacity
90	200%
60	170%
45	140%
30	100%

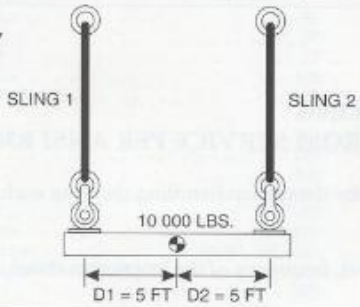
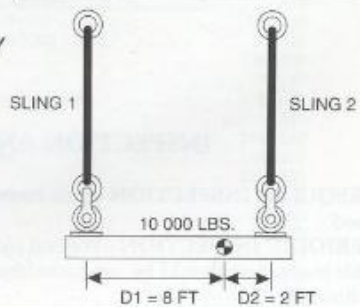
A basket hitch has twice the capacity of a single leg only if legs of sling are vertical.

# Sling Information

REEVING INCREASES LOADS	TRIPLE AND QUAD LEG SLINGS
	
<p>Reeving through connections to load increases load on connections fitting by as much as twice.</p> <p style="text-align: center; font-weight: bold; margin-top: 20px;">DO NOT REEVE!</p>	<p>Triple leg slings have 50% more capacity than double leg only if the center of gravity is in center of connection point and the legs are adjusted properly. (equal share of the load)</p> <p>Quad leg slings offer improved stability but do not provide increased lifting capacity.</p>

## CENTER OF GRAVITY (COG)

The location of the center of Gravity to the pick points is an important consideration.

<p><b>CENTER OF GRAVITY and SLING LOADING</b></p> 	<p><b>CENTER OF GRAVITY and SLING LOADING</b></p> 
<p>When lifting vertically, the load will be shared equally if the center of gravity is placed equally between the pick points. If the weight of load is 10,000 lbs., then each sling will have a load of 5,000 lbs. and each shackle and eyebolt will also have a load of 5,000 lbs.</p>	<p>When the center of gravity is not equally spaced between the pick points, the slings and fittings will not carry an equal share of the load. The sling connected to the pick point closest to the center of gravity will carry the greatest share of the load.</p> <p>Sling 2 is closest to COG. It will have the greatest share of load.</p> <p>Sling 2 = <math>10,000 \times 8 / (8+2) = 8,000</math> lbs.</p> <p>Sling 1 = <math>10,000 \times 2 / (8+2) = 2,000</math> lbs.</p>

# Respirator Selection

Logic Guide: Reference ANSI Z89.2 – 1992 7.2.2.

Respirator selection involves reviewing each operation to (a) determine what hazards may be present (hazard determination) and (b) select which type or class of respirators can offer adequate protection.

## Hazard Determination Steps

The nature of the hazard shall be determined as follows:

- Determine what contaminant(s) may be present in the work place.
- Determine whether there is a published Threshold Limit Value, Permissible Exposure Limit, or any other available exposure limit or estimate of toxicity for the contaminant(s). Determine if the IDLH concentration for the contaminant is available.
- Determine if there is a comprehensive health standard (e.g., lead, asbestos) for the contaminant(s). If so, there may be specific respirators required that influence the selection process.
- If the potential for an oxygen-deficient environment exists, measure the oxygen content.
- Measure or estimate the concentration of the contaminant(s).
- Determine the physical state of the contaminant. If an aerosol, determine or estimate the particle size. Determine if vapor pressure of the aerosol is significant at the maximum expected temperature of the work environment.
- Determine whether the contaminant(s) present can be absorbed through the skin, produce skin sensitization, or be irritating or corrosive to the eyes or skin.
- Determine for a gas or vapor contaminant(s) if a known odor, taste, or irritation concentration exists.

## Selection Steps

The proper respirator shall be selected as follows:

- If unable to determine what potentially hazardous contaminant may be present, the atmosphere shall be considered IDLH.
- If no exposure limit or guideline is available and estimates of the toxicity cannot be made, the atmosphere shall be considered IDLH.
- If a specific standard exists for the contaminant, follow those guidelines/requirements.
- If there is an oxygen-deficient atmosphere, the type of respirator selected depends on the partial pressure and concentration of oxygen and the concentration of the other contaminant(s) that may be present.
- If the measured or estimated concentration of the contaminant(s) is considered IDLH, reference “Respirators for use under IDLH conditions” at the end of this guide.
- Divide the measured or estimated concentration of each contaminant by the exposure limit or guideline to obtain a hazard ratio. When two or more substances are present, consideration needs to be given if there is a synergistic or combined effect of exposure rather than considering each substance individually. Select a respirator with an assigned protection factor greater than the value of the hazard ratio, as listed in Table XXX.
- If the contaminant(s) is a gas or vapor only, select a device with an assigned protection factor that is greater than the hazard ratio. The concentration shall also be less than the maximum use concentration of the cartridge/canister.
- If the contaminant is a paint, lacquer, or enamel, select a respirator approved specifically for paint mists or an atmosphere-supplying respirator. (Approval label or regulatory provision may preclude use for some paints.)
- If the contaminant is a pesticide, select a respirator and filtration system specifically approved for

- pesticides or an atmosphere-supplying respirator. (Approval label may preclude use for some pesticides.)
- If the contaminant is an aerosol with an unknown particle size, or less than 2 um (MMAD), a high-efficiency filter shall be used.
  - If the contaminant is a fume, use a filter approved for fumes or a high-efficiency filter.
  - If the contaminant is an aerosol with a particle size greater than 2 um (MMAD), any filter type (dust, fumes, mist, or high efficiency) may be used.
  - If the contaminant is a gas or vapor and has poor warning properties, the use of an atmosphere-supplying respirator is generally recommended.
  - When atmosphere-supplying respirators cannot be used because of the lack of a feasible air supply, or the need for worker mobility, air-purifying devices should be used only if:
    - The air-purifying respirator has a reliable end-of-service-life indicator that will warn the user prior to contaminant breakthrough or,
    - A cartridge change schedule is implemented based on cartridge service data including desorption studies (unless cartridges are changed daily), expected concentration, pattern of use, duration of exposure, and the chemical does not have a ceiling limit.
  - Respirators for use under IDLH atmospheres:
    - The required respiratory protection for IDLH conditions caused by the presence of toxic materials, or a reduced percentage of oxygen, is a combination full face piece pressure demand supplied air respirator (SAR) with auxiliary self-contained air supply. For rescue applications, a full face piece pressure demand SCBA certified by NIOSH for a minimum service life of thirty minutes is acceptable.
    - When respirators are worn under IDLH conditions, at least one standby person shall be present in a safe area. The standby person shall have the proper equipment available to assist the respirator wearer in case of difficulty. Communications (visual, voice, signal line, intercom, radio or other suitable means) shall be maintained between the standby person and the wearer. While working in the IDLH atmosphere, the wearer shall be equipped with a safety harness and lifeline to permit removal to a safe area, if necessary. Provisions for rescue other than harness and lifeline may be used, if equivalent.
    - Special considerations for confined space entry into IDLH conditions are not addressed in this policy.



## Acceptable Fit-Testing Methods

	QLFT	QNFT
Half-Face, Negative Pressure, APR (<100 fit factor)	Yes	Yes
Full-Face, Negative Pressure, APR (<10 fit factor) Used in atmospheres up to 10 times the PEL	Yes	Yes
Full-Face, Negative Pressure, APR (>100 fit factor)	No	Yes
PAPR	Yes	Yes
Supplied-Air Respirators (SAR), or SCBA used in Negative Pressure (Demand Mode) (>100 fit factor)	No	Yes
Supplied-Air Respirators (SAR), or SCBA used in Positive Pressure (Pressure Demand Mode)	Yes	Yes

## Assigned Protection Factors

Type of respirator	Respiratory inlet covering			
	Half Mask <sup>1)</sup>		Full Face piece	
Air purifying	10		100	
Atmosphere supplying SCBA (demand) <sup>2)</sup> Airline (demand)	10		100	
Type of respirator	Respiratory inlet covering			
	Half mask	Full Face	Helmet/ hood	Loose-fitting face piece
Powered air purifier Atmosphere supplying airline	50	1000 <sup>3)</sup>	1000 <sup>3)</sup>	25
Pressure demand	50	1000	1000	25
Continuous flow		1000		
Self-contained breathing apparatus	50	<sup>4)</sup>		
Pressure demand Open/closed circuit				
<p>Includes ¼ mask, disposable half masks, and half masks with elastomeric face pieces.</p> <p>Demand SCBA shall not be used for emergency situations such as firefighting.</p> <p>Protection factors listed are for high-efficiency filters and sorbents (cartridges and canisters). With dust filters, an assigned protection factor of 100 is to be used due to the limitations of the filter.</p> <p>Although positive-pressure respirators are currently regarded as providing the highest level of respiratory protection a limited number of recent simulated workplace studies concluded that all users may not achieve protection factors of 10,000. Based on this limited data, a definitive assigned protection factor could not be listed for positive-pressure SCBA's. For emergency planning purposes where hazardous concentrations can be estimated, an assigned protection factor of no higher than 10,000 should be used.</p> <p>NOTE: Assigned protection factors are not applicable for escape respirators. For combination respirators, e.g., airline respirators equipped with an air-purifying filter, the mode of operation in</p>				

## Use and Duration of Cartridges

Contaminant (1)	Maximum Concentration	Maximum Use Time (2) (Hours)
1,3 Butadiene	50	1
Ammonia	100	4
Benzene	10	8
Benzene	50	4
Chemicals not specified (3)	NA	1
Naphtha	100	4
Naphtha	500	2
Particulates (including dusts, mists, welding fumes)	NA	8
Sulfur Dioxide	50	8
Total Hydrocarbons (as n- hexane)	100	4
Total Hydrocarbons (as n- hexane)	500	1

If more than one contaminant is present, use the lowest maximum use time.

Cartridges should be changed out if the contaminant can be detected inside the respirator mask, regardless of the maximum use time.

Cartridges for chemicals not listed should be used for only 1 hour. This will err on the side of safety. If specific information is needed on a particular chemical, consult with the MSDS or your supervisor.

# Supplied Air Equipment Checklist

Cylinders & Associated Equipment	Yes	No	Hoses and Fittings	Yes	No
Pressure: All bottles, i.e. 6 paks must be changed at 500 psi (SCBAs will be full for rescue or standby)			Serviceable condition		
			Connected properly		
			No leaks		
Gauges					
Valve and check valve			<b>Face piece and Regulator</b>	<b>Yes</b>	<b>No</b>
Cylinder Valve Cover(s)			Lens is clean		
Alarm			Tear off Lens Present		
Regulator-coupling secured			Face seal (fit check)		
<b>SCBA Frame and Harness Assembly</b>	<b>Yes</b>	<b>No</b>	Head straps		
			Purge valve		
Waist belt			Exhalation valve & diaphragm		
Shoulder straps			Adequate air flow		
Snaps, buckles, clips					

**Note:**

Cylinders which show evidence of exposure to high heat or impact damage shall be removed from service and retested prior to recharging.

Do not use tools to open or close the purge valve (finger-tight only).

Route hose lines in a manner that does not restrict access/egress.

Make sure your work does not endanger others in your immediate area or downwind.

## HAZARD EVALUATION SUMMARY

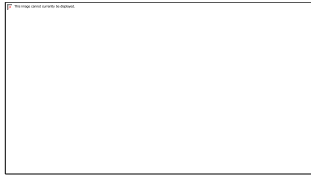
Work Activity	Contaminants	Exposure Monitoring	Permissible Exposures	Controls
Asbestos Insulation Work	Asbestos	Sample prior to start of work	0.1 f/cc TWA	<p>Not in excess of 1 f/cc - ½ mask APR w/ high efficiency filters</p> <p>Not in excess of 5 f/cc – FF APR w/high efficiency filters</p> <p>Not in excess of 10 f/cc – PAPR w/high efficiency filters</p>
Opening equipment containing Benzene	Benzene	Prior to opening	1 ppm	<p>&lt; 1 ppm – No respirator.</p> <p>Less than or 10 ppm ½ mask APR w/ organic vapor cartridge</p> <p>Less than or 50 ppm FF APR w/organic vapor cartridge</p> <p>Less than or 100 ppm FF PAPR w/ organic vapor cartridge</p> <p>Less than or 1000 ppm supplied air FF respirator</p> <p>&gt; 1000 ppm SCBA</p>
Opening equipment containing Butadiene	Butadiene	Prior to opening	1ppm (TWA)	Same a Benzene
Lead paint work Activities covered: Dry abrasive blasting  Burning, flame-torch cutting & welding  Grinding, sanding or buffing with power tools	Lead	Sample prior to start of work	50 Ug/M3 (TWA)	<p>Airborne concentration of Lead</p> <p>Not in excess of 0.5 mg/M3 – ½ APR w/high efficiency filters</p> <p>Not in excess of 2.5 mg/M3 – FF APR w/high efficiency filters</p> <p>Not in excess of 50 mg/M3 PAPR w/high efficiency filters</p>
Opening equipment containing H2S	H2S	Sample prior to start of work	10 ppm	< 10 ppm No respirator

## Subcontractor Qualification Scorecard

Subcontractor Name: \_\_\_\_\_

Please answer the following questions.

1.  Yes  No Do you have a written safety program? If yes, provide a copy of the table of contents and a copy of your firm's policy statement.
2.  Yes  No Do you require and use site-specific safety plans?
3.  Yes  No Do you have clearly defined safety responsibilities for managers, supervisors and workers?
4.  Yes  No Do managers/executives visit the worksite? How often? Provide details.  
  
\_\_\_\_\_
5.  Yes  No Does your company have a written drug/substance abuse policy?
6.  Yes  No Do you have an orientation program for new hires?
7.  Yes  No Do you conduct daily site safety inspections?
8.  Yes  No Do you have a disciplinary policy and procedure?
9.  Yes  No Do you hold site safety meetings for field workers & supervisors?  
How often? Weekly  Biweekly  Monthly  Daily
10.  Yes  No Do you have special work procedures in place for critical or potentially high hazard jobs?
11.  Yes  No Do you have Personal Protective Equipment standards in place?
12.  Yes  No Do you have Emergency Action Plans in place for your worksites?
13.  Yes  No Do you have Joint Health and Safety Committee meetings?
14.  Yes  No Do you have a pre-job planning process (JSA, JHA, on-job hazard assessment)?
15.  Yes  No Do you have an accident and incident reporting system in place?
16.  Yes  No Do you have a procedure in place to investigate and follow-up on accidents and incidents?
17.  Yes  No Have you received any OSHA citations in the past 3 years? If yes, provide an attachment describing the outcome of the inspection along with copies of citations received. Provide a description of the actions taken for any open citations.
18.  Yes  No Do you have a designated Competent Person on the project site?



# BRINK CONSTRUCTORS INC.

## Training Qualification

Employee

Has been trained in the safe use and operation of an Aerial/Man Lifts – (type) \_\_\_\_\_.

The training includes:

- Reading and understanding of the Operator’s Manual
- Equipment Checklists
- Pre and Post Operations
- Safety Orientation

Employee Acknowledgement	Date
Trainer’s Endorsement	Date



# BRINK CONSTRUCTORS INC.

## Training Qualification

Employee

Has been trained in the safe use and operation of Cranes lifting less than 15 tons.

The training includes:

- Reading and understanding of the Operator's Manual
- Equipment Checklists
- Pre and Post Operations
- Safety Orientation

Employee Acknowledgement	Date
Trainer's Endorsement	Date





# BRINK CONSTRUCTORS INC.

## Training Qualification

Employee

Has been trained in the safe use and operation of Cranes lifting less than 35 tons.

The training includes:

- Reading and understanding of the Operator's Manual
- Equipment Checklists
- Pre and Post Operations
- Safety Orientation

Employee Acknowledgement	Date
Trainer's Endorsement	Date



# BRINK CONSTRUCTORS INC.

## Training Qualification

Employee

Has been trained in the safe use and operation of Cranes lifting greater than 36 tons.

The training includes:

- Reading and understanding of the Operator's Manual
- Equipment Checklists
- Pre and Post Operations
- Safety Orientation

Employee Acknowledgement	Date
Trainer's Endorsement	Date



# BRINK CONSTRUCTORS INC.

## Training Qualification

Employee

Has been trained in the safe use and operation of Forklifts. Type: 1, 4 & 5 (Standard Type)

The training includes:

- Reading and understanding of the Operator's Manual
- Equipment Checklists
- Pre and Post Operations
- Safety Orientation

Employee Acknowledgement	Date
Trainer's Endorsement	Date



# BRINK CONSTRUCTORS INC.

## Training Qualification

Employee

Has been trained in the safe use and operation of Forklifts. Class: 7 (Rough Terrain)

The training includes:

- Reading and understanding of the Operator's Manual
- Equipment Checklists
- Pre and Post Operations
- Safety Orientation

Employee Acknowledgement	Date
Trainer's Endorsement	Date



# BRINK CONSTRUCTORS INC.

## Training Qualification

Employee

Has been trained in the safe use and operation of the Digger/Derrick.

The training includes:

- Reading and understanding of the Operator's Manual
- Equipment Checklists
- Pre and Post Operations
- Safety Orientation

Employee Acknowledgement	Date
Trainer's Endorsement	Date

