EXPRO National Manual for Projects Management

Volume 11 ,Chapter 1

Project New Employee HSSE Summary Flyer

Document No. EPM-KS0-MN-000001 Rev 003

Document Submittal History:

Revision:	Date:	Reason For Issue
000	19/10/2017	For Use
001	03/12/2017	For Use
002	19/11/2018	For Use
003	09/08/2021	For Use

THIS NOTICE MUST ACCOMPANY EVERY COPY OF THIS DOCUMENT

IMPORTANT NOTICE

Table of Contents

1.0 PURPOSE

The purpose of these flyers to outline the potential hazards associated with the “High Risk “activities that occur on most Construction sites. Each Flyer can be used as a training tool as well as posters. These posters can be displayed in prominent areas where all personnel can see and read them.

2.0 SCOPE

The scope of these Flyers applies to all works performed under all Government Construction Contracts executed throughout the Kingdom of Saudi Arabia.

3.0 DEFINITIONS

Definitions	Description
Accident\Incident	An unplanned event which results in an injury or illness, damage to property, plant, products or the environment.
Anti-two Block	A system installed to crane winches that warns and/or prevents two-blocking. Two-blocking is defined as, *" the condition in which the lower load block (or hook assembly) comes in contact with the upper load block (or boom point sheave assembly), seriously interfering with the safe operation of the crane."*
Barricade	System designed to warn of a hazard and physically identify the hazard’s parameters. Barricades (also referred to as barriers) can be “soft” or “hard” in construction, depending on the intended use and the nature of the hazard being protected
COSHH	Control of Substances Hazardous to Health
Competent:	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 has authorization to take prompt corrective measures to eliminate them.
CSM/FM	Construction Site Manager/Facilities Manager
Db(A)	Relative loudness of sounds in the air as perceived by the human ear.
Equivalent	Alternative designs, materials, or methods to protect against a hazard, which the employer can demonstrate, will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.
GFCI	A **ground fault circuit interrupter (GFCI),** also called ELCB Earth Leakage Circuit Breaker or Residual Current Device (RCD) is a device that shuts off an electric power circuit when it detects that current is flowing along an unintended path, such as through water or a person
Hazardous Work Permit (HWP)	A document that indicates hazardous conditions, required protective measures, and approvals to work within controlled areas.
HCP	Hazard Communication Plan
Hoist	An appliance intended for raising and lowering a load or people, vertically and without slewing which includes a mast climbing work platform, personnel and materials hoist, scaffolding hoist and serial hoist but does not include a lift or building maintenance equipment
HSSE	Health, Safety, Security and Environment
JHA	Job Hazard Analysis
LOTO	Lockout/Tagout
MEWP	Mobile Elevating Work Platform
PPE	Personal Protective Equipment
PSI	**PSI** is a unit of pressure expressed in pounds of force per square inch of area. It stands for Pounds per Square Inch
SCBA	Self-Contained Breathing Apparatus
SDS	Safety Data Sheet
STARRT	Safety Task Analysis, Risk Reduction Talk

4.0 REFERENCES

EXPRO White Book procedures:

- Project General Safe Working Requirements Procedure- EPM-KSS-PR-000001
- Project Housekeeping Requirements Procedure- EPM-KSS-PR-000002
- Project Hazard Communication Procedure- EPM-KSS-PR-000024
- Project Personal Protective Equipment Procedure- EPM-KSS-PR-000003
- Project Fall Protection Procedure- EPM-KSS-PR-000005
- Project Scaffolding Control Management Procedure- EPM-KSS-PR-000033
- Project Barricades and Signs Procedure- EPM-KSS-PR-000006
- Project Floor and Wall Openings Procedure- EPM-KSS-PR-000028
- Project Confined Space Procedure- EPM-KSS-PR-000007
- Project Excavation and Trenching Procedure- EPM-KSS-PR-000032
- Project Suspended Personal Platforms Procedure- EPM-KSS-PR-000015
- Project Hazardous Work Permit Procedure- EPM-KSS-PR-000016
- Project Lockout/Tagout Procedure- EPM-KSS-PR-000031
- Project Portable Ladders Inspection and Control Procedure- EPM-KSS-PR-000011
- Project Crane and Lifting Operation Procedure- EPM-KSS-PR-000018
- Project Elevated Work Platform Procedure- EPM-KSS-PR-000008
- Project Compressed Gas Cylinder Procedure- EPM-KSS-PR-000009
- Project Electrical Safety Procedure- EPM-KSS-PR-000021
- Project Vehicle Safety Management Procedure- EPM-KSS-PR-000023
- Project Heat Stress Management Procedure- EPM-KSH-PR-000008
- Project Pollution Control Procedure- EPM-KSE-PR-000001
- Project Waste Management Procedure- EPM-KSE-PR-000002
- Project Control of Hazardous Materials Procedure- EPM-KSH-PR-000007
- Project Manual Material Handling Procedure- EPM-KSS-PR-000027

5.0 REVIEW

This document shall be reviewed yearly, based on performance trends and lessons learned from incidents or Project Specific requirements.

6.0 GENERAL DESCRIPTION

The attached flyers have been designed as a result from the most common incidents that occur on job sites. The flyers give a graphic indication to employees on the “Do’s and Don’ts”.

The following pages outline common problems and recommendations/training that personnel can attend, to ensure that the risk of injury can be reduced. Each contractor shall develop a training package to cover these activities.

6.1 Safety Task Analysis & Risk Reduction Talk (STARRT)

Safety Task Analysis & Risk Reduction Talk (STARRT) is a process that utilizes employee participation to identify and resolve environmental, safety and health hazards associated with a specific task prior to performing the task. Job Hazard Analysis (JHA) or Method Statements are a more detailed process that identifies hazards at each step of the job, risks are evaluated and safety precautions are put in place.

STARRT Requirements

- Discuss risks associated with project scope of work and compile information for STARRT card at the beginning of each shift for each new task (or task within each shift).
- Supervisors must verify effectiveness of STARRT process monthly.
- Send completed and signed STARRT / Re-STARRT cards to Project HSSE when it's complete or at end of shift.

JHA (or Method Statement) Requirements

- Conduct Method Statements / Risk Assessments for all tasks that contain steps that may pose a hazard to personnel.
- Include Method Statements as appropriate in hazardous work permits, work plan / packages as well as project / facility specific HSSE plans.
- Identify specific steps that are hazardous, evaluate risks and propose controls for any jobs that include hazardous work.

COMMON PROBLEMS

- Failure to verify supervision in STARRT process
- No follow-up of STARRT process to ensure adequacy
- STARRT Process not properly implemented (personnel signing blank cards, cards completed in advance, cards not completed.)
- STARRT cards being completed by HSSE staff only (no craft or field supervision involved)
- Method Statements are not being completed at all, or, do not properly address the hazards
- Method Statements are inaccurate and/or Supervision fails to plan work in accordance with its requirements
- Craft personnel not working to Method Statement requirements to reduce hazards

RESOURCES / TRAINING

- STARRT Supervisor Training

Picture Key:

1. *All personnel involved in a work task must participate in the STARRT Briefing prior to starting work*
2. *Failure to follow requirements of JHA for proper crane set-up – both outriggers must be fully extended to ensure safe operation*
3. *Method Statement is developed with participation from affected parties to ensure proper identification and assessment of job hazards*
4. *Worker in violation of Method Statement hazard control requirements (under a suspended load, hands on load, tripping hazards, etc.)*

6.2 General Safe Work Practices

This contains Life Critical Requirements related to "defeating safety devices". These devices can be defined as any device designed to prevent the unintentional operation of equipment (an interlock) or physical contact with moving components or hazardous elements (a guard). Defeating a safety device would be any action taken to bypass or remove this primary design function and increasing the potential for injuries or accidents.

Hand, Air and Electrical Tools

- The rated speed of the grinding wheel (RPM) must be equal to or greater than the maximum speed of the grinder.
- Gasoline-powered tools must be used in ventilated areas.

Temporary Heating Devices

- When using temporary heating devices there must be adequate ventilation and fresh air return.

Concrete and Masonry Work

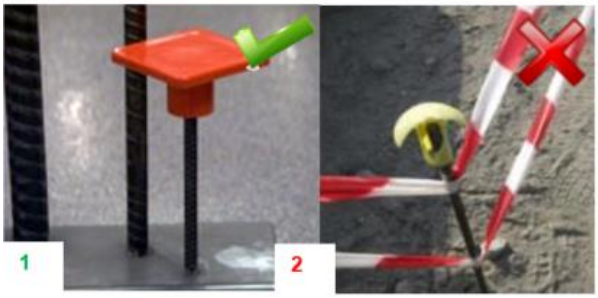
- All protruding reinforced steel must be guarded to eliminate the hazard of impaling employees.
- Work is not allowed under concrete buckets while the buckets are being elevated or lowered into position.
- All masonry walls more than 8 feet (2.4 meters) high shall be adequately braced to prevent overturning and collapse.

Exits

- All buildings designed for human occupancy must be provided with exits that permit quick, safe escape of occupants in case of emergency.
- There must be at least two means of egress in different locations from each other in hazardous areas.
- There must be at least two means of egress where employees may be endangered by the blocking of any single exit (egress) due to fire or smoke.

Underground Construction

- A competent person must be assigned to perform all air monitoring and determine proper ventilation and quantitative measurements of potentially hazardous gases.
- Fresh air must be supplied to all underground work areas in sufficient quantities to prevent dangerous or harmful accumulation of dust, fumes, mists, vapors, or gases.



COMMON PROBLEMS

- Guards and/or safety devices either removed or improperly installed on tools and equipment
- Hand tools in poor or damaged condition – No tagging and removal polices in place – Unapproved job-made tools used
- Lamps for general illumination not protected against breakage
- Personnel not observing smoking restrictions on site
- Exits and/or emergency equipment blocked or inaccessible
- Inadequate barricading for entrances to underground locations

RESOURCES / TRAINING

- New Employee Induction
- For all training packages see HSE Representative.

Picture Key:

1. *Proper rebar cap designed to prevent impalement (has a metal plate insert built-in to square cap top)*
2. *Mushroom-type rebar cap designed for abrasion prevention not impalement prevention – note how rebar breaks through cap*
3. *Worker stands alongside concrete bucket to dump the load into place – bucket lifted only to height necessary to accomplish work*
4. *Workers standing under the suspended concrete bucket as it is being moved into position over pillar*

6.3 Housekeeping Requirements

For the purpose of this Procedure, housekeeping is the act of keeping the working environment clear of all unnecessary waste and debris to ensure a first-line of defense against accidents, injuries, fire and environmental pollution.

General Requirements

- *Perform housekeeping, as related to*: clear access, material / tools / equipment management, spills and clean-up, electrical cables / cords management, wood working operations,++waste containers, flammable materials management, health and hygiene considerations, and environmental considerations.
- *Conduct / participate in training* on Housekeeping requirements (including waste management and environmental compliance) and responsibilities based on scope of work / area.

Materials, Tools and Equipment Management

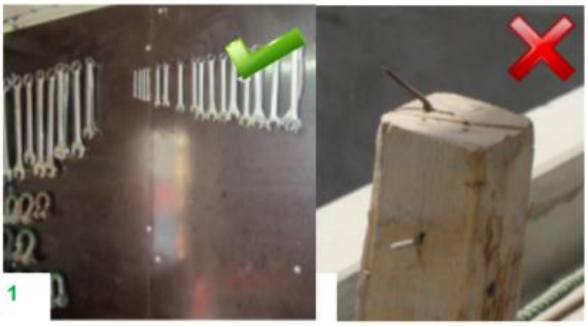
- Remove all nails from timber and wood prior to storing and stacking the materials.

Waste Management and Environmental Compliance

- Supervise housekeeping and implement waste management and environmental compliance practices.
- Document and keep project records as they relate to housekeeping, waste management and environmental compliance.

Access and Egress Routes

- Keep all emergency exits and access passageways, fire doors, break-glass alarm points, firefighting equipment, first aid stations, and other emergency stations clean and unobstructed.



COMMON PROBLEMS

- Failure to remove nails from waste lumber or from wood that has been reused
- Emergency equipment blocked or inaccessible
- Regular scheduled housekeeping inspections not occurring
- Trash is not removed at end of each shift – and is allowed to reach overflow conditions

RESOURCES / TRAINING

- New employee induction

Picture Key:

1. *Good housekeeping practices are equally important in shops and tool cribs as they are in the working areas*
2. *Nails must be removed from timbers immediately, especially those pieces that will be reused*
3. *Work area keep clear; walking and working surfaces unobstructed; materials kept to minimum required for one shift work*
4. *Trash must not be allowed to reach overflow conditions, especially trash containing waste oils, lubricants, solvents, paints, etc.*

6.4 Hazard Communication Program (Part 1)

The Hazard Communication Program (HCP) applies to any hazardous material and Safety Data Sheet (SDS). HCP: allows for protection of workers from the potential dangers associated with hazardous materials; provides guidelines for administering an onsite hazardous materials control program; and, communicates information to workers on the potential hazards associated with hazardous materials.

General Responsibilities

- The Construction Site Manager / Facilities Manager (CSM/FM) ensures that only approved chemicals are brought on site.
- Supervisors ensure that all hazardous chemicals are properly labeled, stored and disposed of.
- Supervisors conduct training for employees in the safe use of hazardous chemicals for routine and non-routine tasks.
- Employees are to handle chemicals and chemical substances in the proper manner.
- HSSE Representative maintains a Hazardous Materials Inventory List.

General Requirements

- The Project HSSE Execution Plan includes a Hazardous Material Control and Communication procedure
- A request for an SDS (or equivalent) to be included in all hazardous materials requisitions.
- When a hazardous material arrives on site, it is checked for proper containerization and labeling and moved to the proper storage area.
- Onsite personnel working with new hazardous materials are given additional training (as needed) on the hazards associated with the materials.

COMMON PROBLEMS

- Incompatible chemicals stored in same location
- Chemical containers with missing or illegible labels
- Personnel not briefed or trained on chemical hazards
- Personnel smoking in close proximity to chemicals
- No site-specific written Hazard Communication Program
- Chemicals stored with other materials, tools, or equipment
- SDSs not maintained or not maintained properly

RESOURCES / TRAINING

- COSHH training
- Fire prevention and protection training

Picture Key:

1. *Portable hazardous chemical storage shed with provisions for proper signage, access control, ventilation, grounding, etc.*
2. *Improper and possibly dangerous storage of hazardous chemical products*
3. *Properly designed hazardous chemical storage facility (controlled access, signs, portable, protection from elements, etc.)*
4. *Unacceptable chemical storage conditions (unlabeled containers, open-top containers, combustible rags, etc.)*

6.5 Hazard Communication Program (Part 2)

The Hazard Communication Program (HCP) applies to any hazardous material and Safety Data Sheet (SDS). HCP: allows for protection of workers from the potential dangers associated with hazardous materials; provides guidelines for administering an onsite hazardous materials control program; and, communicates information to workers on the potential hazards associated with hazardous materials.

Hazard Communication Program

- Project-specific Hazard Communication Program for workers is onsite (as part of the project's HSSE training program).
- Provisions in place for hazards associated with chemical products are communicated to affected or potentially affected personnel.
- Provide employees with access to information about chemical hazards and associated requirements.
- HSSE Representative performs an evaluation of all hazardous materials to determine if alternatives / substitutes are available.
- Update the Hazardous Material Inventory List when a potentially hazardous chemical is brought on site for the first time.
- Keep SDSs in a designated location onsite, logically organized and available to employees during work hours and/or in reasonable proximity to the work location.
- Project has a process to quarantine or otherwise ensure the product is not used until the SDS can be obtained if a product is received on site (or encountered on site during an inspection) without an SDS.
- Hazardous materials are stored in a manner that adequately protects both human health and the environment from unintended exposure to the primary hazards associated with the materials.

COMMON PROBLEMS

- Chemical information not made available to employees
- Failure to create, update, or maintain a Hazardous Materials Inventory List
- Storage of hazardous materials in inappropriate locations or with incompatible materials

RESOURCES / TRAINING

- COSHH training
- Fire prevention and protection training

Picture Key:

1. *A properly design Chemical Safety Information Station complete with SDS Binder and other related chemical safety information*
2. *Oxygen cylinder (white) stored in same location as propane and butane – oxidizers and fuel gas must not be stored together*
3. *Chemical storage shed equipped with proper safety shower for immediate access in the event of chemical contact/exposure*
4. *Workers mixing and heating chemicals with no safety precautions in place (PPE, ventilation, labeling, housekeeping,*

6.6 Hazard Communication Program (Part 3)

The Hazard Communication Program (HCP) applies to any hazardous material and Safety Data Sheet (SDS). HCP: allows for protection of workers from the potential dangers associated with hazardous materials; provides guidelines for administering an onsite hazardous materials control program; and, communicates information to workers on the potential hazards associated with hazardous materials.

Subcontractor Responsibilities

- Subcontractors to provide SDSs for all chemical substances they bring on site.
- Subcontractors must be advised on the hazardous chemicals that may be onsite.
- Storage areas must be located away from high traffic areas and reasonably protected from the potential for vehicle/equipment damage by guardrails, fences or other structural controls.
- Storage areas must be located away from fence line locations immediately adjacent to environmentally sensitive resources (e.g., wetlands, streams, archeological sites).
- Storage provided with adequate secondary containment to minimize the release of accidentally spilled product to the environment.
- Storage areas provided with a means of segregating combustible and flammable materials from oxidizing agents and other sources of ignition.
- Storage areas provided with a means of preventing water reactive and pyrophoric (igniting spontaneously or giving off sparks when struck) materials from coming in contact with accumulated water.

Training

- Project provides initial information and training whenever a new employee and/or visitor arrives on site.
- Personnel sign the Hazard Communication Program Training Log (or other such documentation) indicating that they have received the required training under the HCP.

COMMON PROBLEMS

- Failure to provide for adequate secondary containment
- Unacceptable storage indicating poor or no inspection practices
- Failure to provide training before assigning personnel to work with chemical products
- Subcontractors unaware of what chemicals are on site

RESOURCES / TRAINING

- COSHH training
- Fire prevention and protection training

Picture Key:

1. *Many examples of proper secondary containment provisions, both stationary and mobile*
2. *Incompatible chemical storage – Clorox (an oxidizer) stored next to oil (a combustible) and paints (flammables)*
3. *Double-wall chemical storage tank provides for adequate containment of chemical product*
4. *Unacceptable chemical storage practices*

6.7 Personal Protective Equipment (Part 1)

The minimum requirements for personal protective equipment (PPE) on all projects includes: **hard hat / safety helmet, safety footwear and eye protection**. PPE shall be worn within all industrial facilities and construction work-sites and whenever there is a significant risk of head injury.

General Responsibilities

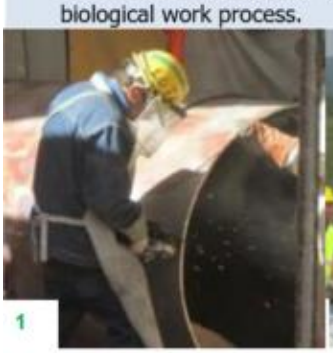
- Employees must wear the appropriate PPE supplied to them at all times while working on their assigned tasks.
- Projects must meet the minimum requirements for PPE (i.e., hardhat, eye protection, sturdy footwear).

Wearing Apparel

- Wear appropriate clothing that protects the body and extremities at all times.
- Wear long sleeve shirts and trousers at all times where the possibility of thermal burns exists (e.g., around hot pipes, welding operations, etc.).

Eye and Face Protection

- Wear suitable protective goggles, faces shields or screens where there may be exposure to an eye or face hazard from either chemical, mechanical or biological work process.
- Wear safety glasses at all times on the project (with the exception of specific areas - e.g., operators inside enclosed cabs, administration building, lunch and break rooms, offices and supervisor shacks, when goggles are worn).
- Employees who wear personal corrective eyeglasses must wear protective lenses and permanent fixed side shields that conform to the requirements of a recognized national or international standard.
- Wear safety goggles or goggles that incorporate a corrective lens mounted behind the protective lens or safety over-glasses for employees who wear corrective lenses that do not meet the protection requirement.
- All safety glasses must have approved side shields (slip-on shields are prohibited).
- Wear a full-face shield and safety glasses or goggles while performing grinding operations.



COMMON PROBLEMS

- Wrong respirators are in use for contaminants
- Workers adjacent to hazardous work do not wear proper PPE
- Supervisors fail to enforce PPE requirements
- When personnel wear prescription glasses that are not safety glasses and/or no proper over-glasses used
- Failure to wear safety glasses at all times in work areas where their use is required

RESOURCES / TRAINING

- PPE Training

Picture Key:

1. *Worker wearing proper PPE for grinding (double eye protection, hearing protection, leather gloves and apron, long sleeve shirt)*
2. *Employees with no eye protection and at least one wearing hard hat backwards*
3. *Employee wearing protective safety glasses over his prescription glasses*
4. *No use of proper PPE (shirt, eye and face protection, head protection, proper respirator for work process, gloves, etc.)*

6.8 Personal Protective Equipment (Part 2)

The minimum requirements for personal protective equipment (PPE) on all projects includes: **hard hat / safety helmet, safety footwear and eye protection**. PPE shall be worn within all industrial facilities and construction work-sites and whenever there is a significant risk of head injury.

Respiratory Protection

- Supply breathing apparatus to all persons who must work where there is a possibility of the atmosphere being or becoming deficient in oxygen.
- Make respiratory protective equipment available to all persons who must work where there is a possibility of the atmosphere containing any harmful substance.
- Select respiratory protective equipment on the basis of hazards to which the employee will be exposed.

Hearing Protection

- Make suitable hearing protection available to all workers exposed to noise levels of 85 dB(A) or above.
- When noise levels reach 85 dB(A) for an 8-hour work period, implement the Hearing Conservation Program requirements.

Hand and Arm Protection

- Adequate hand and arm protection must be made available and be used by personnel.

Body Protection

- Provide specific and adequate body protection to personnel working in activities involving welding, burning, cutting and grinding.
- Provide specific and adequate body protection to personnel handling or mixing acids and other toxic, corrosive or hazardous chemicals.
- Provide specific and adequate body protection to personnel working in activities involving clean up and disposal of hazardous wastes (e.g., asbestos, hydrocarbons, etc.).

COMMON PROBLEMS

- Employees not provided with or using proper gloves
- Areas not marked or posted for PPE requirements
- Employees not using body protection when performing hot work
- Failure to use hearing protection in high noise areas

RESOURCES / TRAINING

- PPE Training

Picture Key:

1. *Proper use of hard hat, hearing protection and eye protection*
2. *Personnel in same work area, exposed to same air contaminants, wearing different types of respiratory protective equipment*
3. *Use of "Picto-Grams" to show required PPE works well, especially where many different languages are spoken or literacy is a problem*
4. *Employees must wear shirts with sleeves at least 10 cm in length – working with no shirt is prohibited*

6.9 Personal Protective Equipment (Part 3)

The minimum requirements for personal protective equipment (PPE) on all projects includes: **hard hat / safety helmet, safety footwear and eye protection**. PPE shall be worn within all industrial facilities and construction work-sites and whenever there is a significant risk of head injury.

Head Protection

- Wear hard hats at all times on the construction site (except in areas where such use is not required such as offices and inside vehicles).

Safety Harnesses and Lifelines

- Provide, wear and properly secure safety harnesses and lifelines in all work situations where required (e.g., at unprotected heights above 1.83 meters, in confined spaces, etc.).

Electrical Protection Equipment

- Provide appropriate electrical protection equipment for the voltage to be encountered whenever working on live lines (i.e., when lockout / tagout is not possible).
- When racking out 4.16 kV bus breakers, personnel must use safety spectacles or goggles covered by a face shield.
- Wear rubber gloves at all times when a worker is in the primary zone (2 meters) from conductors and equipment energized in excess of 600 volts) and can contact an energized conductor.
- All insulating equipment made of rubber must be inspected for damage before each day's use and immediately following any incident that can be reasonably be suspected of having caused damage.

Life Jackets

- Personnel must wear life jackets when working around or over water (e.g., working from a boat, near open water, or in any place where the danger of drowning exists, including work in specific areas of cooling tower basins).

COMMON PROBLEMS

- Incorrect wearing of hard hats in reverse without manufacturer approval
- Safety harness not secured to proper anchorage point
- Lifelines not engineered to ensure adequate factor of safety
- Personnel not wearing PPE when working near water
- Not using proper arc-flash protection when working on live electrical systems

RESOURCES / TRAINING

- PPE training

Picture Key:

1. *Employee using horizontal lifeline properly tied-off at a height at least above his waist*
2. *Work at unprotected height with no fall protection at all – also note improper, unsecured, job-made ladder used to access work area*
3. *Life jackets properly cleaned, stored, and maintained – ready for use by personnel working on or near water*
4. *Employee not wearing proper PPE when working on live electrical system, is unprotected when arc flash occurs*

6.10 Fall Protection (Part 1)

LIFE CRITICAL - ***This document has been designated as Life Critical.***
Life Critical Rule: Never work at unprotected heights or near openings without the use of required fall protection.

Fall Protection Systems consist of primary (e.g., scaffolding) and secondary fall protection (e.g., harness). Efforts to identify and eliminate hazards and prevent falls must precede efforts to arrest falls.

General

- Employees must use approved full-body safety harnesses where primary fall prevention systems are inadequate and/or fall exposures exist.
- Secondary fall protection must be used for personnel traveling or working in elevated areas more than 1.83 meters above ground level or adjacent surface where a fall exposure exists.
- Personnel must secure their safety lanyard to a structure, lifeline, or approved fall arresting device capable of supporting 2268 kg.
- Fall protection devices such as lifelines, safety harnesses/lanyards, etc. must be inspected for damage and/or deterioration prior to use.
- Defective equipment must be removed from service and destroyed or returned to the HSSE Department and destroyed.
- Fall protection devices subjected to shock loading during fall arresting must be removed from service and destroyed.
- Subcontractors must make maximum use of primary fall prevention systems such as scaffolds, aerials lifts, personnel hoists, etc.
- Primary fall prevention systems must be equipped with complete working/walking surfaces free of floor openings, with standard guardrail systems in place and a safe means of access.
- Regardless of the potential falling distance, fall protection must be used when the fall could result in impalement or other injury (e.g., working over a hot process, operating equipment).

COMMON PROBLEMS	RESOURCES / TRAINING
• Personnel not using engineered anchorage points • Lack of documented inspections for fall protection equipment • Impaling objects not protected or improperly protected	• Work at height training • 100% tie-off training • STARRT training

Picture Key:

1. *Employees properly tied-off to horizontal lifeline above head height*
2. *Employees improperly secured to lifeline below knee height*
3. *Proper lifeline attachment to engineered vertical support post*
4. *Improper securing of horizontal lifeline to rebar vertical structure*

6.11 Fall Protection (Part 2)

LIFE CRITICAL - ***This document has been designated as Life Critical.***

Life Critical Rule: Never work at unprotected heights or near openings without the use of required fall protection.

Fall Protection Systems consist of primary (e.g., scaffolding) and secondary fall protection (e.g., harness). Efforts to identify and eliminate hazards and prevent falls must precede efforts to arrest falls.

Fall Protection Systems

- 100% fall prevention must be achieved by using primary AND/OR secondary fall protection systems.
- Floor opening covers must be capable of supporting the maximum potential (subjected) load.
- Floor opening covers must completely cover the opening/hole and be secured to avoid displacement.
- Aerial lifts must be placed on solid level surface to eliminate overturning.
- Personnel using aerial lifts are prohibited from tying-off their fall protection to an adjacent pole, structure or other equipment.
- Employees in aerial lifts must stand firmly on the floor of the basket or platform (climbing on the railing or using planks, ladders, or other devices is prohibited).
- Personnel riding in or working from mobile work platforms must wear an approved safety harness and securely connect to a suitable anchor point on the platform.
- Personnel riding in or working from hoisting devices (spiders, ski climbers, crane baskets, etc.) must wear an approved safety harness/lanyard system at all times.
- Personnel riding in or working from hoisting devices (spiders, ski climbers, etc.) must be provided with an independent lifeline and rope grab or self-retracting lifeline when aloft at all times.
- The lanyard and anchorage point must limit the maximum fall potential to 1.83 meters.
- Shock absorbers must be provided with all harnesses.

COMMON PROBLEMS

- Poorly installed lifeline systems and/or lifeline systems not inspected by competent person, as required
- Project not achieving 100% fall protection requirement (i.e., free climbing)
- Personnel climbing on toe-board or mid-rail of extendable boom man lift baskets
- Personnel not wearing or securing fall protection while in scissor lifts

RESOURCES / TRAINING

- Work at height training
- 100% tie-off training
- STARRT training

Picture Key:

1. *Manufacturer-provided anchorage point for fall protection on platform*
2. *Improper anchorage to hand rails of platform*
3. *Properly protected floor hole openings with rigid covers and signage*
4. *Inadequate hole cover (not rigid, not complete, not secured, no signage)*

6.12 Fall Protection (Part 3)

LIFE CRITICAL - *This document has been designated as Life Critical.*
Life Critical Rule: Never work at unprotected heights or near openings without the use of required fall protection.

Fall Protection Systems consist of primary (e.g., scaffolding) and secondary fall protection (e.g., harness). Efforts to identify and eliminate hazards and prevent falls must precede efforts to arrest falls.

Fall Protection Systems *(cont'd from Part 2)*

- D-rings on fall protection devices must be used properly.
- As structures are erected, you must consider proper lifeline placement.
- A minimum safety factor of 2 must be maintained at all times for horizontal lifeline systems.
- Lifelines must be arranged to provide adequate mobility in all areas of the structure while maintaining 100% fall protection for personnel.
- Personnel installing lifelines must be protected from falls at all times by using retractable lanyards or by tying off to structural steel, etc.
- Safety nets must be fitted as close to the working surface as possible, but no lower than 1.83 meters below the work.
- Temporary construction ladders must extend at least 91.4 cm above their uppermost landing and secured at top.
- Personnel climbing ladders that are not tied-off at the top must have another person hold the ladder at the bottom until it can be secured.
- Personnel who must lean through or over protective railings must properly secure their lanyard.
- Personnel riding in or working from mast climbing work platforms must wear an approved safety harness and be securely connected to a suitable anchor point on the platform.
- Soft barricades must be placed more than 1.83 meters from the edge when used for vertical banked excavations.
- Rigid (hard) barricades must be no closer than 0.6 meters from the edge for vertical banked excavations.

Training

- Employees required to work at heights must be trained in fall hazard protection, fall hazard equipment, and the requirements of Fall Protection Procedure.

COMMON PROBLEMS

- Poor consideration of fall protection when using ladders
- Improper consideration of fall protection requirements around excavations
- Soft barricades placed closer than 1.83 meters minimum distance from edge of trench
- Lifelines not installed or engineered properly

RESOURCES / TRAINING

- Work at height training
- 100% tie-off training
- STARRT training

Picture Key:

1. *Unsecured ladder being held in place during use by another employee*
2. *Ladder not secured; employee using ladder improperly*
3. *Soft barricades placed more than 1.83 meters from edge of trench; area is clean and well-maintained*
4. *Soft barricades placed too close to leading edge of trench; debris in trench increases injury potential in a fall event*

6.13 Scaffolding

Life Critical Rule: Never access any scaffold without documented evidence of inspection by a designated competent person before each work shift.

The standard work process for the erection, control and dismantling of scaffolding

Responsibilities

- The Responsible Foreman must ensure scaffolds are built complete and in a safe manner including the proper inspection upon completion, and regular inspections until dismantling occurs.
- The scaffold Competent Person must ensure scaffolds are built per requirements, are properly tagged, and that all erected scaffolds are inspected at the commencement of each shift.
- Superintendents/Foreman must ensure that all employees understand and comply with project requirements regarding the safe use of scaffolding including scaffold tagging, scaffold inspection, and fall protection.

Training

- Scaffold users must be trained in the hazards associated with the various types of scaffold and understand the procedures to control or minimize these hazards.

General Requirements and Inspections

- The Competent Person must inspect each new scaffold as well as all existing scaffolds prior to use at the start of each shift, and after any occurrence that could affect a scaffold's structural integrity.
- Any defective components discovered during inspections must be immediately discarded.

Scaffold Tagging

- Personnel are not permitted to work from an untagged scaffold.

COMMON PROBLEMS

- Scaffold access ladders extending more than 6.09 meters failing to have a retracting lifeline or other vertical lifeline system installed
- Access ladders failing to extend at least 0.91 meters over any landing or scaffold platform
- Lack of 100% tie off required for work outside of complete scaffold platforms
- Improper tagging (e.g., green-tagged with missing/broken features or incomplete sections)

RESOURCES / TRAINING

- Scaffolding training
- Ladders training
- 100% tie-off training

Picture Key:

1. *Properly completed scaffold inspection tag posted at entrance to scaffold*
2. *Diagonal brace not connected to scaffolding*
3. *Proper wood timber used under scaffold poles for stability*
4. *Scaffold pole placed on unstable ground, partially collapsing and creating a hazard to workers on scaffold*

6.14 Barricades and Signs

LIFE CRITICAL

This document has been designated as Life Critical. Life Critical Rule: Never disregard or bypass signage and barricading.

A barricade is defined as a system designed to warn of a hazard and physically identify the hazard's parameters. Barricades can be "soft" or "hard" in construction, depending on the intended use and the nature of the hazard being protected.

General

- Imminent danger areas must be marked with red and black barrier tape – not yellow and black caution tape.
- Only authorized personnel are permitted inside the barricaded area where work is considered immediately dangerous to life and health.
- All protective barricades must be capable of supporting 90.7 kg of force.
- Swing-radius of the super-structure (e.g., crane) must be barricaded as an IMMINENT DANGER AREA when it is capable of rotating and creating pinch points.

Erection of Barricades

- Barricades must not block emergency equipment (e.g., plant fire extinguishers, safety showers, fire doors).

Radiography Barricading

- Only authorized personnel (radiography crew) are allowed to enter an area designated for radiography work.

COMMON PROBLEMS

- Imminent danger areas are not properly barricaded (or not barricaded at all)
- Tags not used on barricades at all access points
- Barricades not complete (e.g., three-sided barricaded areas)
- Swing radius of cranes are not barricaded
- Flashing amber lights not on barricades left in roadways at night
- Safety warning signs faded, damaged, or difficult to read
- Barricades placed closer than designated distance from deep excavation

RESOURCES / TRAINING

- New employee induction
- Excavations and trenching training
- Crane and lifting operations training
- Vehicle machine interface training

Picture Key:

1. *Rigid barricade, placed minimum of 0.6 meters from edge, capable of supporting 90.7 kg of force*
2. *Soft barricades poorly maintained, placed closer than 1.83 meters from edge of excavation*
3. *Swing radius of crawler crane properly protected with barricades that move with the crane*
4. *Traffic cones used in an attempt to protect the swing radius of crane – provides no real warning or protection*

6.15 Floor and Wall Openings

Floor Hole: Any gap or void measuring 30.5 cm or less at its largest dimension, but more than 2.5 cm at its smallest dimension, in any floor, roof, or platform through which materials, but not persons, may fall. Floor Opening: Any gap or void measuring 30.5 cm or more at its smallest dimension in any roof, floor, or platform through which a person could fall. **Wall Opening**: A gap or void at least 76.2 cm high and 45.7 cm or more wide in any wall or partition through which persons may fall to a lower level, such as doorways, chute openings, or rigging openings.

General Requirements

- Personnel working inside of a barricaded area around a floor or wall opening are required to wear and use a safety harness.
- The supervisor of any employee creating a floor hole, floor opening or wall opening must ensure that the floor hole, floor opening or wall opening is properly covered.

Floor or Wall Penetrations

- Secure floor hole covers to prevent them from slipping or being displaced by personnel traffic.

Cover Removal, Alteration and Marking

- Personnel must stand guard over opening and wear appropriate fall protection PPE when floor holes, floor openings or wall covers are uncovered for a short period.
- Install anchored guardrail systems (per Barricades and Signs and Floor and Wall Openings Procedure) for uncovered openings for an extended period of time.

COMMON PROBLEMS

- Floor holes are not covered properly (or not at all)
- Floor and wall openings are not marked or posted
- No use of barricades around uncovered floor and wall openings
- No use of fall protection around uncovered floor openings
- Materials being incorrectly stacked/stored on floor covers
- Floor coverings are not secured against displacement

RESOURCES / TRAINING

- STARRT training
- Work at height

Picture Key:

1. *Hole cover with proper warning signage, as required*
2. *Floor covers must completely cover the opening and be fixed to prevent displacement*
3. *Opening in roof too large to cover – properly barricaded to protect the hazard*
4. *Even small trenches and floor openings must still be protected with proper covers and signage*

6.16 Confined Space Entry (Part 1)

LIFE CRITICAL - This document has been designated as Life Critical.

Life Critical Rule: Never enter a confined space unless trained, authorized and an entry permit has been completed.

The term permit-required confined space describes a confined space that has one or more of the following characteristics: contains or has the potential to contain a hazardous atmosphere; contains a material that has the potential to engulf an entrant; has walls that converge inward or floors that slope downward and taper into a smaller area which could trap or asphyxiate an entrant; or contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat stress.

General

- Risk analysis or Method Statement must be prepared, to identify the controls required for a safe operation.
- Testing must be performed to identify potential hazards.
- Where applicable, proper lockout and tagout must be performed to isolate energized sources within the confined space.
- Equipment must be provided for testing, ventilation, communications, lighting, access and egress, personal protection, and emergency/rescue.
- Confined spaces must be monitored prior to and during work entry operations.

Testing and Monitoring

- The HSSE Representative or designee must perform pre-entry testing to determine if acceptable entry conditions are present prior to entry.
- If it is necessary to enter a hazardous atmosphere space to perform pre-entry atmospheric testing, an air respirator must be supplied and worn.
- Before any employee enters a confined space, the internal atmosphere must be tested with a direct-reading instrument for oxygen content, flammability levels, toxic contaminants, and (when applicable) radiological hazards.
- The HSSE Representative or designee must perform periodic or continuous air monitoring to ensure that acceptable conditions exist always during the entry operation.
- When test results are not within acceptable parameters, engineering controls must be implemented to make the confined space acceptable for entry.

COMMON PROBLEMS

- Poor warning for others around should an evacuation of the space be necessary
- Lack of discussion of confined space safety requirements in the STARRT meeting
- Personnel not signing-in/out when entering or leaving space

RESOURCES / TRAINING

- Confined Space Entry training

Picture Key:

1. *Multi-gas checks being made prior to allowing workers to enter a confined space*
2. *Unprotected confined space could be easily accessed without authority – should be covered and posted with warning signs*
3. *Worker with proper PPE (including rescue harness) being helped into confined space by authorized Attendant*
4. *Entering a confined space that is partially filled with water without using any PPE*

6.17 Confined Space Entry (Part 2)

Life Critical Rule: Never enter a confined space unless trained, authorized and an entry permit has been completed.

The term permit-required confined space describes a confined space that has one or more of the following characteristics: contains or has the potential to contain a hazardous atmosphere; contains a material that has the potential to engulf an entrant; has walls that converge inward or floors that slope downward and taper into a smaller area which could trap or asphyxiate an entrant; or contains any other recognized safety or health hazard, such as unguarded machinery, exposed live wires, or heat stress.

Special Precautions

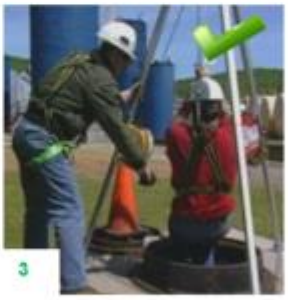
- When work in a confined space is to be performed by subcontractor or other personnel, the project procedure must ensure that personnel follow confined space entry procedure requirements.
- Energy-isolating devices must be used in accordance with project tagging and lockout procedures whenever a confined space contains potentially hazardous energy sources.
- Lines that may convey flammable, injurious, or incapacitating substances into confined space must be disconnected, blinded, or blocked off.
- No source of ignition will be introduced into a confined space until appropriate control measures are implemented and test results verify that flammable/explosive conditions do not exist.
- Whenever oxygen-consuming equipment (e.g., salamanders, plumbers' torches, or furnaces, etc.) are to be used, measures must be taken to ensure adequate supply of combustion air and venting of exhaust gases.

Entry Rescue Provisions

- Where the need to enter, permit required confined spaces has been identified, required rescue equipment must be maintained at the project (e.g., SCBA, body harness/retrieval line, tripod, rescue rigging, etc.).

Permit Requirements

- A confined space entry permit must be completed prior to beginning any work in a space meeting the definition of a confined space.



COMMON PROBLEMS

- Leaving compressed gas hoses, or other sources of oxygen displacing gas inside a confined space
- Not maintaining a rescue plan with trained and qualified personnel
- Lack of an Attendant being present at all times when personnel are working in a confined space
- No provision for communicating with workers while in space

RESOURCES / TRAINING

- Confined Space Entry training

Picture Key:

1. *Worker checks a confined space for oxygen content and other contaminants/hazards before and during confined space operations*
2. *Welding in a confined space with no provisions for ventilation of toxic fumes and gases*
3. *Proper provisions for confined space entry and rescue operations*
4. *Extremely inappropriate provisions for confined space entry and rescue operations*

6.18 Excavation and Trenching

LIFE CRITICAL This document has been designated as Life Critical. Life Critical Rule: Never access an excavation deeper than 1.2 meters that has not been sloped, benched or shored and an excavation permit completed.

An excavation is any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. A trench is defined as a narrow underground excavation that is deeper than it is wide, and no wider than 4.5 meters.

Earthwork Operations

- Excavations and adjacent areas must be inspected at least once a day for possible cave in, failure of protective systems and equipment, hazardous atmosphere or other potentially hazardous conditions.
- Trenches 1.2 meters or more in depth must be properly shored, or the walls cut back to the appropriate slope, to protect employees from collapse.
- Spoil material removed from an excavation (and any other material storage) must be kept at least 0.6 meters away from the excavation edge.
- Soft barricades must be kept at least 1.83 meters from open edges of trenches and excavations.
- No employee is permitted underneath loads handled by lifting or digging equipment.
- Employees must remain clear/stand away from any vehicle that is being loaded or unloaded to avoid being struck by spillage or falling materials.

Excavation Permits

- Prior to starting an excavation, the Responsible Supervisor and Competent Person must ensure that all required safety measures are in place.

Excavation Work Operations

- A Competent Person must identify hazards, conduct daily inspections, and conduct inspections during and/or following rainstorms.
- A Competent Person must complete the Daily Trench Report.

COMMON PROBLEMS

- Daily inspections of excavations (Trench Report) do not occur or are not documented
- Shoring or other protection systems not used in trenches deeper than 1.2 meters
- Spoil material not removed from site or placed closer than 2 feet from edge of excavation
- Barricades closer than 1.83 meters from edge of vertical excavation
- Ladders not provided for ingress/egress in excavations and trenches
- Excavation and trenches not appropriately identified with signs, warnings and barricades

RESOURCES / TRAINING

- Excavation and trenching training

Picture Key:

1. *Properly completed and approved Excavation Permit for each excavation*
2. *Damaged (bent) and unsecured ladder used in deep excavation – note also unstable concrete blocks at leading edge*
3. *Excavation with proper slope and access provisions for personnel (wooden staircase)*
4. *Excavator working on crumbling leading edge of excavation with personnel working in line of fire*

6.19 Suspended Personnel Platforms

LIFE CRITICAL

This document has been designated as Life Critical. Life Critical Rule: Never operate any mechanical elevated work platform without documented training.

A suspended personnel platform is defined as a single-level personnel platform or man-basket, with properly designed guardrails and suspension system, suspended from a crane load line that has been specifically designed to transport personnel to an elevated work site.

Trial Lift

- A trial lift must be conducted prior to hoisting personnel in a suspended personnel platform.
- The trial lift must include a lift of the unoccupied personnel platform, which has a test weight attached that is 125 percent of platform rated capacity.
- The supervisor must conduct a final visual inspection of the crane, rigging, personnel platform, and crane base support immediately after the trial lift to determine if the testing exposed any defects or adverse conditions.
- All defects found after the trial lift must be corrected before placing personnel in the platform.
- After any repair or modification of the suspended personnel platform, the platform and rigging must be proof-tested to 125 percent of the platform's rated capacity by holding the platform in suspension for 5 minutes.

Respiratory Protection-Special Precautions/Provisions

- Proper respiratory protective equipment must be provided if personnel are hoisted in a crane basket in an area where an accidental release of hazardous chemicals could occur.
- When applicable, the crane operator must have at least 15 minutes of breathing air immediately available (e.g., emergency breathing apparatus, SCBA, etc.).
- When applicable, a 5-minute emergency escape breathing apparatus (air capsule) must be provided for each person in the basket.

COMMON PROBLEMS

- Trial lifts do not occur or are not occurring in accordance with Suspended Personnel Platform Procedure requirements
- Trial lifts not documented
- Man baskets used do not have documentation (e.g., engineering drawings, manufacturer requirements, etc.)
- Personnel do not access basket or access crane hook-up properly

RESOURCES / TRAINING

- Lifting Operations training

Picture Key:

1. *Employee in proper/fit-for-purpose man-basket with required PPE and tie-off in accordance with manufacturer requirements*
2. *Two of three workers not tied-off while in suspended personnel platform*
3. *Proper use of pendant line between shackle and crane load line*
4. *Worker "riding" load under assumption that the load is a proper suspended personnel platform – no use of harness*

6.20 Hazardous Work Permit

A Hazardous Work Permit (HWP) is a document that indicates hazardous conditions, required protective measures and approvals to work within controlled areas.

General Requirements

- A HWP is used for tasks that pose an increased risk of serious injury or illness.
- A HWP is required for work determined by the HSSE Representative to be significantly hazardous.
- The HWP Requestor or HSSE Representative properly completes the work description information section of the permit.
- The HWP is properly logged and documented to provide the required information (e.g., hazardous conditions, site surveys, required PPE, monitoring and special instructions).
- A copy of the HWP is available for each contractor and work crew (where applicable).
- The HSSE Representative must retain a hard copy of HWPs in a project file.
- HWPs are cancelled and new ones are generated when major Field Changes are necessary.
- The requirements of a HWP are reviewed with applicable personnel prior to work and periodically thereafter by the immediate supervisor or by the HSSE Representative.
- Issue a blanket WP to cover a wide variety of low hazard tasks, such as facility reconnaissance, preliminary visits, surface sampling, surface water sampling and similar tasks.

COMMON PROBLEMS

- HWP not at job site
- Failure to complete HWP prior to work start
- Using outdated or expired permits
- Not complying with requirements of HWP
- Employees not aware of HWP (no briefing)
- HWP not updated when work scope changes
- Inconsistent use of HWP on project

RESOURCES / TRAINING

- Confined Space Entry training
- Excavation and trenching training

Picture Key:

1. *Electricians in proper PPE performing zero energy check in accordance with HWP requirements*
2. *Worker involved in Asbestos Abatement work not wearing proper PPE (head, hair, skin protection) in violation of HWP requirements*
3. *Asbestos Abatement workers using adequate PPE and ensuring proper containment of asbestos materials as per HWP requirements*
4. *Employee entering a Confined Space with no provisions for rescue, ventilation, or air monitoring in violation of HWP requirements*

6.21 Lockout/Tag out Procedures

LIFE CRITICAL

This document has been designated as Life Critical. Life Critical Rule: Never commence work until all energy sources have been identified and isolated in accordance with procedures.

Lockout/Tagout (LOTO) refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment or the release of hazardous energy during service or maintenance activities. All projects must implement a procedure that provides effective controls against the release of hazardous energy of all types, including but not limited to pressure (pneumatic, hydraulic, etc.), mechanical (dynamic and kinetic), electrical, and thermal (steam, heat, etc.).

Requirements (General)

- Lockout keys must be kept in a lock box under Tagging Authority control.
- Adequate safeguards/provisions must be in place if lockout key is lost or misplaced.
- Tagging Authority and Responsible Engineer must approve all cases when Safety Tags must be temporarily lifted and replaced (i.e., to support work or testing).
- If the safety of affected personnel may be compromised during a temporary lift, they must stop their work and sign the permit.
- Temporary lifts may only be performed while the Permit Requestor is in direct personal control of the lift.
- All authorized and affected employees will be trained to the LOTO procedure.

Safety Tagging Permit Requirements

- The Permit Requestor will conduct the required walk down of the equipment or system boundary and identify the recommended protective measures, safety tagging, and lockouts.
- The specific protective measures (safety tags and locks), as per the applicable/approved System/Component Safety Tagging Permit, must be properly implemented.
- The Permit Requestor (and any Supplemental Requestors, when applicable) must independently verify all tags/locks are within the permit boundary before signing and dating the permit.
- Personal locks may not be used in lieu of a safety lockout/tagout and must be removed when the person is not actively working on the equipment/system.
- Personal locks must contain the individual's name and entity.
- When work is completed, the Requestor(s) will verify that the work is complete and that the isolated components and system are ready to be restored.

COMMON PROBLEMS

- Locks used, but no tags
- Permit system not implemented
- Personnel not trained in LOTO requirements
- More than one key issued for each lock
- Hazardous energy not properly identified

RESOURCES / TRAINING

- STARRT training

Picture Key:

1. *Properly completed and installed lockout/tagout device (name and date washed out on photo)*
2. *Improper lockout – no tag used and keys left in the lock*
3. *Proper secure storage container for lockout/tagout equipment*
4. *Improper, unsecure, uncontrolled storage of lockout devices*

6.22 Portable Ladders Inspection and Control

A portable ladder is a ladder that can readily be moved or carried, usually consisting of side rails joined at intervals by step, rungs, cleats, or rear braces.

General Requirements

- Two or more people must not work from the same ladder (unless it is specifically designed for two people).
- Job-made ladders must be fabricated in compliance with applicable governmental regulations and conform to the general rules applying to the use of manufactured ladders.
- Side rails of all ladders must extend 91.4 cm above the landing (or when not practical, grab rails must be installed).
- All ladders in use must be tied, blocked, or otherwise secured to prevent displacement.
- Only nonmetallic, approved ladders must be used during operations where employees may encounter electrical circuits or systems.

Ladder Specifications

- All portable ladders must be equipped with nonskid safety feet and placed on a stable base (when in use).

Ladder Inspection Requirements

- Ladders must be in good condition at all times.
- Defective ladders must be removed from service and repaired or destroyed.

COMMON PROBLEMS

- Metal ladders in use on projects in close proximity to live electrical works
- Ladders in use not tied-off or secured
- Ladders do not always extend 91.4 cm above landing level
- Job-made ladders not properly constructed
- Non-skid feet missing from portable ladders
- When not in use, ladders are not being stored properly or protected/secured
- Damaged ladders in use
- Quarterly inspections not conducted and/or documented

RESOURCES / TRAINING

- Ladder training

Picture Key:

1. *Ladder end extender correctly positions ladder to the required height above the landing and also provides hand-holds for users*
2. *Incorrect positioning when using straight ladders; employees twisting torsos, reaching beyond centerline, removing foot from ladder*
3. *Proper placement of extension ladder to access platforms – ladder is secure and extends at least three rungs above landing*
4. *Ladders stored improperly, in open area, exposed to the elements*

6.23 Cranes and Lifting Operations (Part 1)

LIFE CRITICAL

This document has been designated as Life Critical. Life Critical Rule: Never conduct lifting operations unless authorized and verified as competent. Never work under a suspended load.

Cranes and lifting require operators to be Competent Persons in crane operation and rigging. Lift risk categories include low risk lifts, medium risk lifts, critical risk lifts and super-critical lifts. Workers must be kept clear of loads about to be lifted and no person must ever be located under a suspended load.

Crane Operators

- Cranes and lifting operators must be competent to operate the crane as proven by examination and hold a current approved certificate.
- Before leaving a crane unattended, the operator must land the load, disengage the master clutch, set all locking devices, put controls in neutral, secure the crane against movement, and stop the engine.

Riggers

- Riggers must inspect and determine whether a wire rope sling or other piece of lifting equipment is damaged or not fit for purpose.

Appointed Persons (Competent Person)

- A Competent Person must assess and plan lifts with regard to the selection of cranes, lifting gear, equipment, instruction and supervision.
- A Competent Person must ensure equipment selected has been adequately inspected and maintained.

Ground Conditions

- Ground conditions must be considered for stability and loading capabilities.
- Outrigger and track loading must be established before positioning the crane.

COMMON PROBLEMS

- Damaged slings in use or no indication of proper inspection
- Improper rigging practices
- No lift plans or incomplete lift plans for critical lifts
- No use of tag lines on loads
- Operators not using crane computer properly
- Slings and other rigging not properly maintained or stored when not in use

RESOURCES / TRAINING

- Crane and lifting operations training

Picture Key:

1. *Worker checks inspection tag on wire rope slings to verify sling is safe prior to use*
2. *Damaged wires in more than one rope lay in a wire rope sling – requires more detailed inspection and possible rejection*
3. *Proper rigging of critical lift with tag lines used and area clear*
4. *Use of unapproved, job-made lifting bucket – note use of crow bar cross beam as attachment point for rigging*

6.24 Cranes and Lifting Operations (Part 2)

LIFE CRITICAL This document has been designated as Life Critical. Life Critical Rule: Never conduct lifting operations unless authorized and verified as competent. Never work under a suspended load.

Cranes and lifting require operators to be Competent Persons in crane operation and rigging. Lift risk categories include low risk lifts, medium risk lifts, critical risk lifts and super-critical lifts. Workers must be kept clear of loads about to be lifted and no person must ever be located under a suspended load.

Outriggers

- Outriggers must be used as specified by the manufacturer of the crane.
- Sound timber packing or metal plates must be positioned under each outrigger pad to distribute the load.
- Outriggers must be properly set and locked (where locking devices are provided).
- Outriggers must be extended on both sides when performing the lifting operation.

Specific Safety Considerations

- Anti-two block devices must be fitted to prevent the head and sheave blocks from coming into contact with one another.
- Every crane must be fitted with an appropriate load radius indicator.
- Personnel involved in crane operations must ensure that workers are never located under a suspended load.

Excavators

- Periodic (at least monthly) inspections must be performed on excavators used for lifting operations.

COMMON PROBLEMS

- Improper use of timbers under outrigger pads
- Workers placing part or all of their bodies under a suspended load
- Daily inspections not being performed by operator
- Swing radius not barricaded properly (or at all)
- Oil leaks not being reported or not being fixed in a timely manner
- Personnel placing hands on load instead of using tag lines

RESOURCES / TRAINING

- Crane and lifting operations training

Picture Key:

1. *Outrigger pads – proper size, shape, and material used*
2. *No packing used under outrigger pad, pad not on level ground, inappropriate use of timbers under outrigger leg*
3. *Worker using tags lines to guide blocks, staying clear of suspended load*
4. *Workers placing part of their bodies (upper thighs) under suspended load (blue bracing)*

6.25 Elevated Work Platforms

LIFE CRITICAL

This document has been designated as Life Critical. Life Critical Rule: Never operate any mechanical elevated work platform without documented training.

Articulating boom platforms are primarily designed and used to position and lift personnel. They are defined as a manually/or self-propelled device that has an adjustable position platform supported from the ground by a structure where the work platform is raised and lowered vertically.

General

- The project must ensure that platforms/baskets are not loaded in excess of the design-working load.
- The operator must ensure that there is sufficient clearance before moving under any overhead obstruction and working near electrical lines.
- The operator must ensure that the platform is not tied-off to any structure for any reason.
- Personnel may only stand on the platform floor (i.e., standing on the railing is prohibited).
- Safety harnesses must be worn and properly tied off inside the platform (i.e., tied-off to approved anchorage points, not to basket handrails).
- The operator must ensure that an articulating boom platform is never left running while unattended.
- The operator must ensure that baskets are not raised with cords, leads or hoses tied to the handrail.

Training

- All personnel who use an articulating boom platform must be trained.

COMMON PROBLEMS

- Operators not complying with Owner's Manual/Manufacturer requirements
- Increasing wind loading on basket using tarps or screening material
- Moving basket with cords and leads attached
- Operators not keeping both feet on the floor of the basket (e.g., climbing on toe-board, mid or top rail)
- Fire extinguisher not in basket during operations
- Operating basket over other personnel

RESOURCES / TRAINING

- MEWP training
- Crane and lifting operations
- Work at height training

Picture Key:

1. *Workers properly tied-off, ensuring clear access in tight working space*
2. *Climbing on railings is prohibited; workers must keep both feet on the platform floor at all times*
3. *Employee using proper (manufacturer-provided) anchorage point inside platform*
4. *Electrical cord tied to platform handrail (could get caught while basket is in motion causing it to break or the basket to tip)*

6.26 Compressed Gas Cylinders

A Compressed Gas Cylinder is any cylinder specifically designed to contain gases under pressure. The procedure establishes requirements to minimize the hazards of using and handling compressed gas cylinders, including cylinders containing gases used for burning, welding, breathing air, fire protection, etc.

Handling/Use and Storage

- Damaged cylinders must be removed from service, tagged (DANGER - DO NOT USE), and reported to the HSSE Department.
- All cylinders must be in the upright position properly secured by a chain, cable, or equivalent method.
- Oxygen cylinders must be stored more than 6.1 meters from combustible gas cylinders (unless protected by a wall at least 1.5 meters high having a fire-resistance rating of at least one hour).
- All gas cylinders must be protected against shock and/or exposure to high temperature extremes.
- For transporting, personnel must use a suitable hand truck, fork truck, roll platform, or similar device with the cylinder secured in the upright position (e.g., cylinders will not be dragged or slid).

Cylinders Designed with Caps

- Never use the protective cap for lifting or handling.

COMMON PROBLEMS

- Incompatible commodities stored in close proximity to each other
- Improper or no use of securing methods while cylinders are in use or in storage
- Hoses being left pressurized when no longer in use
- No use of flash-back arrestors or back flow arrestors
- Use of broken gages
- No labeling of empty containers
- Cylinders stored against occupied facilities or alongside roadways

RESOURCES / TRAINING

- Compressed Gas Training

Picture Key:

1. *Flashback arrestor properly installed in-line at the torch end*
2. *No flashback arrestor installed, and damaged acetylene hose in use*
3. *Cylinders properly installed on trolley with gauges and in-line flashback arrestors at regulator*
4. *Cylinders in use in horizontal position, not secured, employees with no PPE*

6.27 Electrical Safety and Equipment and Assured Grounding

The need for assured grounding applies to all electrical cord sets and receptacles not part of a permanent electrical wiring system in a building or structure; and electrical equipment and tools used in construction.

120V/240V Single Phase Equipment

- Employees must visually inspect receptacles, extension cords, and equipment connected by cord and plug before each day's use (to determine whether there are external defects).
- If there is evidence of damage, the damaged items must be taken out of service and tagged with a defective tool tag.

GFCI/ELCB Requirements

- GFCIs/ELCBs must be provided for lavatory, washroom, and change room outlets.
- GFCIs/ELCBs must be provided for all areas having a moist or wet atmosphere where electrical equipment or portable electric tools may be used.

Power Generators

- Generators and welding transformers must be maintained in good condition.
- All rotating components must be guarded.
- Outlets must be in good condition with no exposed conductors.

Distribution

- The project must prohibit the splicing of cables (i.e., cables will be extended or repaired using the correct fittings).

Hand Tools

- Equipment casings must be intact with no loose fittings or exposed cables.

COMMON PROBLEMS

- Quarterly inspections not occurring or not documented
- Improper wiring/splicing techniques
- Open circuits in panels (blanks not installed)
- Poor cable and cord management (tripping hazards and cables subjected to damage)
- GCFIs/ELCBs not included in Quarterly inspection program
- Damaged electrical cords and tools still in use
- Electrical cords and cables improperly routed or not protected

RESOURCES / TRAINING

- Temporary electrical equipment training

Picture Key:

1. *Proper distribution panel with no exposed circuits or live electrical conductors*
2. *Distribution panel with missing breakers and exposed electrical conductors – blanks should be installed*
3. *Using cable bridges to elevate electrical cords to prevent tripping hazards and protect cords from damage*
4. *Unsafe "job-made" electrical service access - note failure to consider grounding requirement*

6.28 Vehicle Safety Management

Vehicle Safety Management provides guidance and direction for on/off-project vehicle operations and road transportation for the driver, transportation manager, vehicle and the vehicle safety management system.

Pedestrian Routes

- Pedestrian routes must be clearly separated from vehicle routes with fencing, temporary barricades, or other suitable means, excluding flagging.
- Pedestrian routes are required to be free from obstructions and have safe and even footing.
- All pedestrian routes must be clearly signed and marked.

Vehicle Routes

- Vehicle routes should be designed to avoid pedestrian routes.
- Vehicle routes must avoid hazards such as excavations, edges of structures and fuel and chemical storage areas.

Driving Rules

- All drivers and passengers must wear seat belts any time a vehicle is in operation.
- Drivers must ensure that lights, signals, horn and brakes are in proper working order.
- Drivers must maintain a safe distance between vehicles.
- Drivers must shut off the vehicle motor when the vehicle is left unattended.
- No smoking or use of mobile/cellular phones while refueling.
- The use of all types of mobile communication devices while driving is prohibited.

COMMON PROBLEMS

- Failure to follow the prescribed journey management plan
- Improper separation of mobile equipment and vehicle roadways from pedestrian walkways
- Lack of spotters for equipment movement
- Poorly equipped vehicles with fire extinguisher, seat belts for driver and passengers, mirrors, lights, sign/placards, emergency triangle, road flares, etc.
- Inappropriate transport of workers to/from work sites

RESOURCES / TRAINING

- Safe drive training

Picture Key:

1. *Traffic Watch directing and controlling flow of heavy equipment into and out of work areas*
2. *Worker too close to dumping truck – in line of fire should truck tip over or begin retracting bed*
3. *Properly barricaded and posted pedestrian access area (no vehicle traffic permitted)*
4. *Dangerous transport of employees to job site in the back of a dump truck*

6.29 Heat Stress Prevention

The effects of work in hot or cold environments depend on factors such as: air temperature and wind, duration of exposure, type of protective clothing and equipment, type of work, level of physical effort and health status of the employee.

General Requirements

- Conduct a risk assessment to determine the potential for heat and/or cold stress exposure during the life cycle of the project.
- Pre-job briefing (STARRT) addresses heat-stress and cold-stress potential.
- Adequate water supplies are available to employees during and throughout the workday.
- Institute a heat stress monitoring program that evaluates exposure to high heat work environments.
- Consider suspending operations when the heat index reaches the "Danger" levels

Heat Stress

- Implement appropriate preventive measures to eliminate or reduce the potential for heat stress exposures.
- Train employees to recognize signs/symptoms and respond to the various heat related disorders.

COMMON PROBLEMS

- Failure to provide adequate drinking water to workers
- No monitoring to determine levels of heat stress
- Improper cold weather gear provided or not worn
- Employees not trained on heat or cold stress recognition and the compounding effects of clothing
- No consideration for the effects of wind chill on exposed workers

RESOURCES / TRAINING

- Heat stress prevention training

Picture Key:

1. *The first line of defense in preventing heat stress is to ensure that plenty of drinking water is available to all exposed workers*
2. *Workers must be trained on how to recognize heat stress and the effects that certain types of PPE can have on increasing stress*
3. *The best way to prevent cold stress is to provide adequate warm weather clothing for exposed personnel*
4. *Improper protection during cold weather work can lead to frost bite, one of the first effects of overexposure to cold conditions*

6.30 Fugitive Dust Control and Suppression

Fugitive dust occurs when material particles are lifted into the air because of either man-made or natural activities. The use of preventive methods to minimize the generation of dust during construction activities reduces its impact on people and the environment.

Why Control Dust?

- Required by permit conditions and/or regulatory requirements.
- Improves working conditions and visibility around the site.
- Protects workforce from adverse health effects, reduces damage to plants/animals, and keeps equipment and vehicles working properly.

Fugitive Dust Control and Suppression

- Reschedule or minimize dusty work during dry and windy conditions.
- Minimize soil and aggregate material handling.
- Sweep paved roads regularly, water roads and work areas, and use environmentally-friendly dust-suppressing chemicals in the water.
- Use water sprays, covers, and temporary seeding and mulch on stockpiles. Use dust filters/shrouds on conveyors and silos.
- Set and enforce onsite speed limits. Cover all dust-producing loads when moving on and off the site.
- Inspect vehicles at all site exit points. Regularly clean the tires and undercarriage to reduce the carryout of mud/stoned and minimize impact of dust on public roads.

COMMON PROBLEMS

- Watering activities not performed on a regular basis, but rather "when we can get to it"
- Excess water applied, leading to muddy and unsafe conditions
- Soil stockpiles not covered or seeded, resulting in wind erosion and precipitation runoff
- Vehicles / machinery operating in excess of posted site speed limits, increasing airborne dusts

ACTIVITY / INSPECTION REQUIREMENTS

- New employee induction
- Supervisors environmental awareness training

Picture Key:

1. *Effective use of water to suppress road dust*
2. *Travel surface not sufficiently wet, allowing fugitive dust to become airborne*
3. *Proper dust suppression during soil stripping activities*
4. *Material handling dust limiting visibility, creating a safety hazard*

6.31 Pollution Control

A spill of hazardous material has the potential to impact human health and the environment. Preventing and eliminating the occurrence of hazardous spills is a vital component of an effective EMS.

Planning

- Keep hazardous materials (e.g., fuel, oils, paints solvents and other liquids) away from areas where they could easily spill onto the ground or enter waterways.
- Tanks / containers are the primary source of hazardous material spillage and should be placed in areas of the site that are a reasonable distance (at least 100 feet) from flowing or standing water, ditches, storm drains or wetlands.
- If not possible, prevent spills from reaching these areas by using: secondary containment under and around tanks or containers, placing them inside buildings with concrete or metal floors, or creating a temporary dirt berm around the tank / container and laying out a continuous sheet of plastic under the tanks and containers.

Execution

- Keep a log of the materials in storage areas and ensure that each tank / container is properly labeled.
- Regularly inspect storage areas to ensure tanks and containers are maintained and not leaking from damaged containers or filling / emptying activities.
- Repair / replace hydraulic hoses and fuel lines in visibly poor condition before the start of the next shift.
- Inspect and maintain hoses or lines on vehicles / machinery for rupture before and after every shift.
- Inspect and maintain vehicles / machinery for leaks from gaskets / valves.
- Ensure adequate spill kits are available for each piece of equipment and kept near each hazardous material storage area. Maintain kits in good working order and restock after use.

COMMON PROBLEMS

- Hazardous materials stored too close to storm drains
- Drip pans not used under parked equipment
- Vehicles/machinery overfilled at fueling station
- Storage containers not correctly / properly labeled
- Spill kits not replenished with adequate supplies

ACTIVITY / INSPECTION REQUIREMENTS

- New employee induction
- Supervisors environmental awareness training

Picture Key:

1. *Effective bunding of fuel truck to provide secondary containment*
2. *Drums stored near drainage ditch*
3. *Spill kits deployed near crane*
4. *Improper labeling and inadequate secondary containment*

6.32 Spill Response

Spill response is an important activity on every project, requiring training and knowledge to know how to manage releases of chemicals used on a site, as it could be the difference between a simple incident that is quickly cleaned up and a major release to the environment involving agency fines or penalties.

Initial response: Safety First!

- First, ensure the safety of the affected area. Never attempt spill response if it poses a risk to personnel.
- Spills of flammable, acidic, highly volatile or other dangerous materials may result in a human health hazard that is much worse than any environmental hazard.
- If the scene is safe, stop the spill at its source. Turn off vehicles / equipment, close valves, or replace lids.
- After the leak or spill has been successfully stopped keep the spilled material from spreading beyond the area.
- Use absorbent pads and granular materials to isolate the spill.
- Dirt berms, ditches, or sumps can be quickly dug to keep liquid from spreading. Ensure that all possible paths the liquid might take are blocked to prevent spreading to storm drains, ditches, or any water.

Notification and Cleanup

- Immediately notify supervision. HSSE staff oversees response activities and cleanup.
- Some spills will require immediate notification of environmental agencies or law enforcement. Failure to make these notifications can result in fines or arrests. All spills must be reported to HSSE staff who will make the determination regarding notification.
- Depending on the material spilled, the used absorbents and contaminated soil or water may need to be managed as a hazardous or special waste. Place all such materials in proper containers as directed by HSSE staff. Do not mix spill waste with other waste as it is dangerous and potentially illegal.
- Ensure that hazardous wastes are properly disposed of. HSSE staff is responsible for identifying proper disposal receptacles, and ensuring that the containers are properly labeled and closed. Immediately move the containers to the approved waste storage area on site.

COMMON PROBLEMS	ACTIVITY / INSPECTION REQUIREMENTS
• Small spills disregarded as insignificant • Spills cleaned up by work crew so "no one will know" and improperly disposed • HSSE not notified of spill	• New employee induction • Supervisors environmental awareness training

Picture Key:

1. *Prompt response to oil spill with absorbent materials*
2. *Diesel spill near haul road ditch with no cleanup response*
3. *Spill kits deployed in weatherproof containers*
4. *Fuel spill with absorbent pads applied, but cleanup yet to be performed*

6.33 Waste Management

Waste management is an integral part of every project, and has elements spanning the entire project cycle from design, to construction execution and start up, and project close out.

General

- Implement and encourage practices that minimize waste production.
- Request only what is needed to get the job done right and use everything requested.
- Retain useable leftover materials and return to storage for use by others.
- Ensure that project personnel understand that they are responsible for cleaning up their own work area and properly storing wastes. A messy work area is an unsafe work area.
- Never leave waste for others to cleanup.

Recycling

- Personnel should actively participate in site recycling efforts.
- Ensure that all personnel are informed of project recycling efforts and understand that everyone is responsible for properly disposing of recyclables.

Waste Types

- Identify, sort, and dispose of waste according to type.
- Trash includes food waste or glass, paper, or plastic contaminated with food.
- Recyclable materials include office paper, plastic, scrap metal, wood, used oil, batteries, used antifreeze, and vegetation from site clearing.
- Hazardous or Dangerous materials include leftover/used paints and coatings, adhesives, contaminated fuels, solvents, degreasers, acids.
- Ensure that waste is not improperly disposed of.

COMMON PROBLEMS

- Expired materials due to amount ordered being excessive for activity – this unused material becomes waste
- Wastes not segregated by type and/or hazard
- Wastes not stored in correct container area
- Waste containers not correctly / properly labeled
- Recyclable materials rendered unrecyclable due to trash / other wastes co-mingled in collection bin

ACTIVITY / INSPECTION REQUIREMENTS

- New employee induction
- Supervisors environmental awareness training

Picture Key:

1. *Effective segregation and labeling of recyclable material*
2. *Drums of waste left unsecured and without secondary containment*
3. *Recyclable waste oil collection with secondary containment*