

TVA
SAFETY

HANDBOOK



Tennessee Valley Authority



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INTRODUCTION

This handbook is intended to be used as a quick reference to basic safe work practices and human performance tools to help promote a zero injury workplace.

An effort has been made to cover common workplace conditions and situations. If you are in doubt about what to do, consult your supervisor.

Safe work execution supports TVA's values and core competencies. TVA's Values and Core Competencies are found at the end of this handbook.

THIS HANDBOOK DOES NOT REPLACE THE APPROPRIATE PROCEDURE, POLICY, TRAINING REQUIREMENT OR OTHER SUCH DOCUMENT. Where TVA safety manual procedures apply to a subject, the procedure number is listed underneath the title of the section. Consult the TVA Safety Manual, facility specific procedures or your Supervisor when additional information or detail is required.

CRITICAL SAFE WORK BEHAVIORS

TVA has identified six critical safe work practices that must be adhered to at all times. Critical safe work practices are as follows:

- ◆ Energy clearance boundaries, lockout/tagout and protective grounding requirements must be followed.
- ◆ Confined space entry requirements must be met.
- ◆ Fall protection requirements must be met.
- ◆ Radiation boundaries must not be violated.
- ◆ Protective barriers for suspended loads must not be breached.
- ◆ Arc-flash protective requirements (de-metal, protective clothing, proper tooling, stand off distances) must be met.

Contractors are subject to critical safe work behaviors as outlined in TVA-SPP-18.004, Section 3.2.2.

TARGET ZERO

Target Zero is a focused approach to prevent accidents and injuries - one day, one shift and one task at a time. The goal is zero because there is NO acceptable level of employee injury. The three components of Target Zero are behaviors, barriers and accountabilities.

Behaviors

Individual choices and behaviors determine whether or not we are working safely. It is human nature to do our best and work safe when being observed, but we must also exhibit the same behavior when no one is watching. Taking time to get the right tool for the job, choosing not

to take a shortcut and following procedures when no one is watching are all examples of exhibiting safe behaviors in the workplace. We must exhibit the right behavior each and every time.

Barriers

We use a variety of barriers in the workplace such as signage, PPE, machine guards, procedures, guard rails and pre-job briefings. We must all work together to ensure that our safety barriers are strong enough to keep us safe from errors and mistakes and heed those barriers that are in place. Additionally, we must think about how barriers can be improved and more effective.

Accountability

Being accountable when it comes to safety is everyone's job regardless of position or work location. Leaders are accountable to their employees to be visible and present in the field, setting clear expectations and removing obstacles to ensure work will be done safely and effectively. Every employee is accountable to themselves and to each other to exhibit safe behaviors and ensure working conditions are free from hazards or hazards are controlled so no one gets hurt.

HUMAN PERFORMANCE

Use the five fundamental human performance tools to support safe and error free work performance.

- ◆ **Pre-Job Briefing** - Actively participate. Ask questions before you start work to ensure safety.
- ◆ **2-Minute Rule** - When you get to the job, take the time to evaluate your worksite before you start work.

Are conditions as expected? Are you on the right unit, equipment or component?

- ◆ **Stop When Unsure and Seek Help** - When conditions change and you are uncertain, confused, or in doubt about any aspect of your job assignment, STOP and notify your immediate supervisor.
- ◆ **Self-Checking** - Stop, Think, Act, Review. Verify you are on the right unit, equipment or component. Think before proceeding and verify the outcome was as expected.
- ◆ **Procedure Use & Adherence** - Always use the right procedures for the work you do. Know where to find them and how to keep them updated.

Pre-Job Brief

Pre-job brief is a tool that allows the worker to think through a job and use knowledge and experience to make the job as safe and efficient as possible. Prepare for the pre-job brief by reviewing procedures, work packages, OE's, JSAs, etc.

Make pre-job briefs **S-A-F-E-R**

- **S**ummarize the key steps.
- **A**nticipate errors for each step and relevant error precursors.
- **F**oresee the worst that could probably happen.
- **E**valuate controls to prevent, catch and recover from errors, and to reduce their consequences.
- **R**eview previous OE relevant to the specific task.

2-Minute Rule

Recognizing abnormal conditions and identifying safety hazards is the first step to error free and event free performance. The 2- minute rule presents the opportunity to identify any issues not previously identified in the pre-job brief or work planning.

- Explore the job site to identify: Right unit, component, or equipment, safety hazards, error precursors (for *critical steps*), work area conditions that are inconsistent with those discussed during the pre-job brief.
- Talk with coworkers/supervisor about hazards and extra precautions to take.
- Eliminate hazards, install appropriate defenses, and develop contingencies.

STOP When Unsure and Seek Help

When uncertainty exists, chances of error are as high as 50%. Whenever a question arises and the answer is uncertain, stop and get help.

- Stop the activity when confused or in doubt.
- Place the system/equipment/component or area in a safe condition.
- Inform you supervisor of the problem and ask for help.

Self-Checking (STAR)

Self-checking helps prevent errors by boosting attention at important points in an activity before an action is performed.

- **Stop** and focus. Eliminate distractions.
- **Think** what will happen with right action. Focus on the step.
- **Act** without losing contact or focus.
- **Review** that the result is as expected.

Procedure Use & Adherence

Procedures help users perform activities correctly, safely, consistently and in accordance with design requirements.

- Before using a procedure, verify the procedure being used is the correct revision.
- Review prerequisites, limits, precautions, initial conditions, and instructions.
- Identify critical steps.
- Follow each step as written.
- Stop when unsure and seek help if a step cannot be performed as written, might injure someone, might damage equipment, leads to wrong/unsafe configuration, is technically incorrect, causes an unexpected result, conflicts with another procedure, or is otherwise unsafe.
- Provide feedback to your supervisor to initiate procedure changes when necessary.

ARC FLASH HAZARD

TVA-TSP-18.1022

- ◆ Do not enter a defined and marked arc flash boundary unless you are trained, understand the specific hazards associated with arc flash and are wearing the proper PPE.
- ◆ Wear required Arc Rated (AR) clothing/PPE when inside an established AF boundary as specified in Appendix A of TVA-TSP-18.1022.
- ◆ When designated to wear AR daily-wear clothing, wear the AR clothing for the length of the shift, unless your job assignment temporarily changes to clearly exclude potential exposure to arc flash hazards, i.e., classroom training, conferences, etc.
- ◆ Clean AR clothing in accordance with the instructions in TVA-TSP-1022, Appendix C.
- ◆ Mark/identify the full distance of the arc flash boundary once established.
- ◆ When using an entire room as an arc flash boundary, barricade the entrance so unauthorized personnel cannot enter.
- ◆ Roll down sleeves and button at the cuff when exposed to arc flash potential. Button shirt collar.
- ◆ Perform live-dead-live checks to verify electrically safe conditions.
- ◆ Use a job safety analysis specific to the type of equipment or component and work activity when:
 - Working on equipment with a calculated incident energy greater than 40 cal/cm².
 - Working on exposed energized parts greater than 480 volts.

ASBESTOS

TVA-TSP-18.903

- ◆ Asbestos may be present in the workplace in many forms including but not limited to: insulation such as pipe, duct, boiler wall, electrical cable insulation and arc chutes; building materials such as transite board, ceiling and floor tile, roofing materials, acoustic and fireproofing insulation; and mechanical products including brake shoes, clutch lining valve packing and gasket material.
- ◆ Treat all materials as suspect asbestos containing material until determined otherwise. Material may be presumed to be asbestos and work may proceed according to the site asbestos exposure control program.
- ◆ All asbestos containing materials shall be removed by appropriately trained personnel. If any material is found to be suspect or containing asbestos, stop work immediately and notify your Supervisor who will notify the Asbestos Program Coordinator.
- ◆ When any operation(s) or task(s) being performed cause damage to asbestos or presumed asbestos which may cause fibers to be released into the air, the following safety precautions shall be followed:
 - Employees or individuals who observe suspect material (e.g. fallen pipe insulation) should immediately stop work, leave the area, and notify their supervisor of the location(s) and nature of the problem.
 - Barricade the area until the material can be cleaned.

- Only trained personnel shall be allowed to clean up the material.
- All work shall be conducted in accordance with TVA-TSP-18.903, Asbestos Management and Exposure Control.

AERIAL LIFTS

TVA-TSP-18.702

Mechanical Requirements

- ◆ All aerial lifts must be equipped with a manufacturer's model specific operating manual.
- ◆ Aerial lifts shall be equipped with a 2 1/2 pound or greater dry chemical fire extinguisher which is accessible from the ground.
- ◆ Each aerial lift shall be conspicuously identified with the following information:
 - Make
 - Model
 - Insulated or non-insulated
 - Qualification voltage and date of test (if insulated)
 - Serial number
 - Rated load capacity of boom and basket
 - Maximum working height
 - Aerial device system pressure or aerial device system voltage, or both
 - Each control shall be marked as to its function

Use Requirements

- ◆ Never operate an aerial lift unless properly trained.
- ◆ Run the aerial lift through its normal operating positions using ground controls prior to lifting personnel.
- ◆ Inspect the aerial lift thoroughly prior to use.
- ◆ Do not use an aerial lift on soft or uneven surfaces without proper padding and cribbing to provide necessary stability to the lift.
- ◆ Keep platforms clean and free of slippery substances.
- ◆ Secure loose tools and objects.
- ◆ Never exceed boom and bucket load limits specified by the manufacturer.
- ◆ Never alter the insulated portion of an aerial lift.
- ◆ Prior to moving the unit into work position, check all controls.
- ◆ Never move an aerial lift when the boom is elevated or personnel are in the basket.
- ◆ Do not refuel with the engine running, when personnel are in the basket or when using the lift in 161kV or 500kV switchyards.
- ◆ Wear a hard hat and proper fall protection when working from an aerial lift. If a safety lanyard greater than two (2) feet in length is required, it shall be a decelerating or self-retractable type.
- ◆ Do not anchor fall protection to other structures or equipment unless entering or exiting the lift.
- ◆ Entry and exit into the lift at heights above 6 feet is permitted when fall protection such as guard rails or

a fall arrest system is used while the worker moves between the lift and the working surface. The fall arrest system must provide 100% fall protection during this move.

- ◆ Do not use cell phones while operating an aerial lift. This includes talking, texting, or use of any applications on the device.
- ◆ Never sit on or climb onto the lip, the mid or top rail of the basket, or use planks, ladders, etc., in the basket for a work position. Stand on the basket/bucket floor.
- ◆ Do not wear pole climbers while performing work from an aerial lift bucket truck.
- ◆ If the aerial lift has outriggers, operate the lift with the outriggers extended and firmly set for stability.
- ◆ Chock the wheels of aerial lifts while in use according to manufacturer instructions.
- ◆ When an employee is in the basket, do not operate ground level lift controls on aerial lifts with upper controls unless there is an emergency.
- ◆ Never use an aerial lift to lift personnel in high winds or adverse weather conditions such as ice, approaching thunderstorms or lightning. Reference the equipment owner's manual for specific wind speed limitations.
- ◆ Properly stow arms, booms and outriggers before driving an aerial lift.

BASIC HEALTH AND SAFETY EXPECTATIONS

TVA-TSP-18.202

- ◆ Never perform a task unless you have been adequately trained.
- ◆ If you see a potential concern, report it.
- ◆ Plan work in a manner that ensures proper barriers are in place to prevent injury.
- ◆ Integrate incident prevention into daily activities.
- ◆ Perform work in a manner that protects fellow workers and members of the public.
- ◆ Partners and contractors are responsible for the safety and health performance of their employees and subcontractors and shall comply with TVA-SPP-18.004.
- ◆ Possession of illegal drugs and intoxicating substances on TVA premises as well as working under their influence is prohibited.
- ◆ Do not report to work under the influence of prescription or illegal drugs or alcohol.
- ◆ Report suspicious behavior.
- ◆ Fighting, scuffling, threats, intimidation, and horseplay are not allowed.
- ◆ Unauthorized possession of firearms, explosives, and fireworks while on TVA property is forbidden.
- ◆ Never abuse, misuse, or modify tools and equipment.
- ◆ Report all injuries, no matter how slight, immediately to your foreman or supervisor, no later than the shift in which it occurred.
- ◆ Do not exceed medical restrictions or limitations. Immediately notify your supervisor whenever a

medical restriction or limitation is applied and when the medical restriction is removed.

- ◆ Employees who feel they cannot continue to work safely because of fatigue, illness, or some other reason shall promptly report the condition to their immediate supervisor or foreman.
- ◆ Know the location of emergency equipment and emergency exits.
- ◆ Know how to report emergencies.
- ◆ Comply with the warnings and instructions of all signs and protective tags.
- ◆ Replace or close electrical panels, cabinets, and junction box covers when work is complete and ensure no exposed wiring or connections exist. This is especially critical in Class 2 areas, and defects in these areas shall be considered imminent hazards.
- ◆ Treat circuits as energized until they are properly cleared.
- ◆ Treat pressure systems as pressurized until they are properly cleared and depressurized.
- ◆ Removal of emergency safety or fire-fighting equipment, is prohibited except for emergency use.
- ◆ Use proper lifting techniques.
- ◆ Wear clothing appropriate for the type of work and as required for high hazard work. Loose clothing, shorts, ties, or the wearing of rings and wristwatches are not suitable for plant operations or operating machinery. Open toe shoes are prohibited in an industrial environment.
- ◆ Properly barricade physical hazards.

- ◆ Use handrails when ascending or descending stairways.
- ◆ Maintain your work area in a clean and orderly manner. Remove debris, tools, and equipment promptly when work is complete. Maintain material, equipment, and tools in designated areas to prevent unauthorized accumulation of material.
- ◆ Never block access/egress paths.
- ◆ Never dispose of unknown or potentially hazardous material without approval from Environmental.
- ◆ Do not create a tripping hazard with cords, hoses, welding leads and similar equipment. Route them in a manner that ensures the tripping hazard is eliminated.
- ◆ Ensure leaks do not create slip or fall hazard. Control leaks until they can be repaired.
- ◆ Remove dangling jewelry or rings when climbing ladders or scaffolds.
- ◆ Necklaces and neck cords used to hang or carry picture badges, dosimetry, ink pens, and similar items shall have at least two weak-link break points at divergent locations.

BATTERIES

TVA-TSP-18.1019

- ◆ Do not disconnect battery system leads while batteries are under load.
- ◆ Only personnel involved in the battery maintenance or battery test shall be in the battery room when battery maintenance and battery testing activities are being conducted.

- ◆ Wear appropriate PPE for battery acid when working on and testing batteries. At a minimum, this includes chemical goggles with a face shields, rubber gloves and either rubber aprons or rain suits made of the proper materials.
- ◆ Keep tools and metal objects off the tops of the batteries to avoid short circuits.
- ◆ Prior to beginning battery work, locate functioning emergency showers and eyewashes in the immediate work area.
- ◆ Assure ventilation systems are operating and in use when charging batteries.
- ◆ When charging batteries, vent caps shall be functioning and kept in place to avoid electrolyte spray.
- ◆ Smoking, open flames, and spark generating activities are prohibited around batteries or in battery rooms.
- ◆ When preparing electrolyte for storage batteries, always pour acid into the water, never the reverse, as the reverse may cause acid splattering.
- ◆ Avoid contact with skin; if acid contacts skin or eyes, flush with water and seek medical attention. Flush eyes for approximately 15 minutes.
- ◆ Use insulated, non-sparking tools when maintaining batteries.

BOATING

TVA-TSP-18.603

- ◆ Visually inspect the trailer, hitch and boat before use. Remove any damaged equipment from service.
- ◆ Before operating a boat, complete the pre-trip boat and vehicle checklist.
- ◆ Two people are required to operate a boat.
- ◆ Do not operate a boat unless you are trained and qualified to do so.
- ◆ Wear an approved Coast Guard personal flotation device (PFD) at all times while in the boat.
- ◆ Check the weather before making a trip in the boat. Avoid hazardous weather conditions.
- ◆ Reduce speed in unfamiliar waters.
- ◆ Make sure there is adequate fuel.
- ◆ Notify your supervisor of the planned route and expected time of return.
- ◆ Carry a secondary means of propulsion such as oars or a small secondary engine.
- ◆ When loading the boat, distribute the load evenly and do not exceed the manufacturer's recommended limitations for material and personnel.

BRUSH CUTTING, TRIMMING, AND CHAINSAW OPERATIONS

TVA-TSP-18.703

- ◆ Always wear proper PPE.
- ◆ Fully inspect all equipment before use.
- ◆ Keep unnecessary personnel away from starting and operating areas.

- ◆ Refuel the engine before starting work while the engine is cool. If refueling is required before the job is completed, wait for the engine to cool if there is a likelihood that fuel can spill or splash on the hot engine. Use funnels to prevent spillage.
- ◆ Make sure that shields, guards, and other safety devices are in place and working properly.
- ◆ Replace or tighten all loose or damaged parts.
- ◆ Maintain good balance and secure footing when operating.
- ◆ Stop the engine before putting the equipment down. Never leave a running tool unattended.
- ◆ Where cutter guards are provided, use them while transporting the tools or equipment.
- ◆ Secure the equipment to prevent fuel spillage and damage during transport.
- ◆ Analyze the work site. Remove any debris that may cause a hazard when the equipment is operated.
- ◆ Keep hands and tools dry, clean, and free of fuel mixture.
- ◆ Never alter or modify equipment.

CHEMICAL USE (HAZARD COMMUNICATION)

TVA-TSP-18.917

- ◆ Use only approved chemicals and controlled materials.
- ◆ Before using the chemical, review the Safety Data Sheet (SDS) to understand the hazards, storage, handling and disposal requirements.

- ◆ Ensure chemicals are labeled. If the labeling on the original container is no longer legible, replace the label in accordance with TVA-TSP-18.917, Hazard Communication.
- ◆ When transferring chemicals from the original container to a secondary container AND the chemical will not be immediately used and under your direct control, use a secondary label. The secondary label shall portray the chemical name, hazards associated with the chemical (explosive, corrosive), and precaution statements such as eye protection or ventilation required.
- ◆ Minimize and control the production of waste. Dispose of waste properly. Contact Environmental with any questions about proper disposal.
- ◆ Implement spill control precautions. Locate any drains in the area that may need to be blocked when using hazardous chemicals.
- ◆ Never throw anything into general trash unless you are certain it is permissible to do so.
- ◆ Take waste to a hazardous waste staging area. Label chemical waste in accordance with site requirements. The following information shall be included: identity of product, group, supervisor or contact name, contact person's phone number and work activity number.

CLEARANCES; LOCK-OUT/TAG-OUT

TVA-TSP-18.613; TVA-TSP-18.615

- ◆ Review the scope of work to determine the isolation points necessary to adequately protect personnel.
- ◆ Isolate energized equipment from all sources of energy before beginning work. Use TVA-TSP-18.613 for Clearances and TVA-TSP-18.615 for Lockout/Tagout (LOTO). Energy sources include but are not limited to: electrical, chemical, mechanical, pneumatic, fluid and gas, hydraulic, thermal, pressurized water, and gravity.
- ◆ Verify right unit, equipment or component as well as absence of energy before beginning work.
- ◆ If any discrepancies are discovered related to energy isolation, immediately contact Operations or the LOTO Administrator.

COMPRESSED AIR

TVA-TSP-18.705

- ◆ When using compressed air for cleaning, limit pressure to 30 psi at the nozzle with the exception of compressed air used with an air lance.
- ◆ Before using compressed air, examine all hose connections to ensure they are tight.
- ◆ Hold the nozzle when turning compressed air on and off.
- ◆ Safety pins are required with Chicago couplings to ensure lines are secure.
- ◆ Do not kink the hose to stop air flow.
- ◆ Keep air hoses out of walkways.

- ◆ Never point a compressed air hose nozzle at yourself or another person.
- ◆ Make sure dirt and debris will not be blown onto other workers when cleaning.
- ◆ Use eye protection when using compressed air.
- ◆ Do not lift air tools by the hose.
- ◆ Maintain equipment in good repair. Servicing of compressed air equipment is only allowed by qualified personnel.

COMPRESSED GASES

TVA-TSP-18.1206

General

- ◆ This section applies to high pressure gas cylinders that are equipped with protective caps such as argon, oxygen and acetylene cylinders.
- ◆ Compressed gas cylinders are considered to be “in use” whenever gas is flowing from the cylinder to the intended application or the cylinder is attached to an active manifold or supply line.
- ◆ Compressed gas cylinders are considered to be “in storage” when they have cylinder caps on them and are not being actively transported.
- ◆ Compressed gas cylinders are considered to be “in transport” anytime they are being transported.
- ◆ Secure all cylinders when in use, transport and storage.
- ◆ Keep cylinder valves closed and capped except when the cylinder is in use.

- ◆ If a cylinder leaks and the leak cannot be stopped by simply tightening the valve or packing nut, move the cylinder outdoors to a well ventilated area.
- ◆ Do not use wrenches on valve hand-wheels. If wheels are hard to open or close, or frozen, contact the supplier for instruction.
- ◆ Close cylinder valves before transport, when the work is finished and when the cylinder is empty.
- ◆ Never use cylinders as rollers or supports whether they are full or empty.
- ◆ Never attempt to mix gases in a cylinder.
- ◆ Never tamper with a safety relief device or valve of a cylinder.
- ◆ Keep cylinders far enough away from welding, cutting and other spark-producing operations so sparks and slag will not reach them or provide a fire-resistant shield.
- ◆ Do not place cylinders where they can become part of an electrical circuit. Keep them away from piping systems and other equipment that may be used for grounding electrical circuits. Never secure cylinders to conduit.
- ◆ When in use, place fuel gas cylinders with the valve end up.
- ◆ Make sure the regulator, fittings and gauges are rated for the pressure to be used.
- ◆ Relieve all pressure on regulator seats when not in use.
- ◆ When placing compressed gases in service, if regulator pressure setting is unknown, adjust the

regulator to minimum pressure and open cylinder valve slowly.

- ◆ Never use oils or greases in oxygen systems.
- ◆ If acetylene cylinders are transported or stored on their side, stand upright and allow at least one hour prior to use.

Transporting and Moving Cylinders

- ◆ Do not hoist cylinders without using a cylinder truck, pallet or similar device. Avoid tilting and rolling cylinders on their bottom edges.
- ◆ When moving cylinders long distances or up and down stairs or ramps, a hand truck, fork truck or similar device should be used.
- ◆ When transporting cylinders by powered vehicles, they shall be secured and capped.
- ◆ Regulators shall be removed and caps replaced when moving cylinders unless the cylinder is firmly secured on a special carrier intended for that purpose.

Storage

- ◆ Mark and segregate empty cylinders separate from full cylinders. Close valves on empty cylinders.
- ◆ Do not store oxygen and fuel gas cylinders in unventilated enclosures, such as lockers, unless they are specifically designed for that purpose.
- ◆ Separate oxygen cylinders in storage from fuel-gas cylinders or combustible materials (especially oil or grease) by a minimum distance of 20 feet (6.1 m) or by a noncombustible barrier at least 5 feet (1.5 m)

high having a fire-resistance rating of at least one-half hour.

- ◆ Post the names of the stored cylinders in cylinder storage areas. Store cylinders grouped by types of gases taking into account the hazards of the gases.
- ◆ Do not expose cylinders to continuous dampness or store near salt or other corrosive chemicals or fumes.

CONFINED SPACE

TVA-TSP-18.801

- ◆ A confined space is defined as a space that:
 - Is large enough and so configured that a person can bodily enter and perform work; AND
 - Has limited or restricted means for entry or exit (for example tanks, vessels, vaults, heaters and pits are spaces that may have limited entry); AND
 - Is not designed for continuous employee occupancy.
- ◆ A Permit-Required Confined Space is a confined space with one or more of the following characteristics:
 - Contains or has the potential to contain a hazardous atmosphere; OR
 - Contains a material with the potential for engulfing an entrant; OR
 - 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.
- ◆ The entry supervisor is the ultimate authority over the space.
 - ◆ Be aware of the possibility of a work area being a confined space. Some are not obvious such as a large valve with a bonnet off or an open pipe.
 - ◆ Consider all confined spaces permit required until proven otherwise in accordance with TVA-TSP-18.801.
 - ◆ Never enter a confined space that has not been evaluated. At a minimum, confined spaces that have been properly evaluated shall have Form 20639, Hazard Evaluation Form posted at non permit spaces or attached to the permit for permit required spaces.
 - ◆ For permit entry spaces, never enter a space that does not have a posted permit. Read the posted permit to ensure it is current and you understand the requirements.
 - ◆ Know the hazards in the space prior to entering including the signs, symptoms and consequences of exposure.
 - ◆ Ensure you are authorized to enter. When entering a permit required confined space, an attendant shall be standing by at the entrance.
 - ◆ Do not attempt to rescue personnel from a confined space unless you are qualified and serving as part of the rescue team.

- ◆ Reference the site confined space inventory list for site if you have a question about the classification of a space.

CONVEYORS

TVA-TSP-18.707

- ◆ Do not operate a conveyor unless you are trained and qualified.
- ◆ Never operate conveyor equipment for materials other than specified or outside its rated capacity and rated speed.
- ◆ You must be qualified and trained to perform maintenance and service.
- ◆ When a conveyor is stopped for maintenance or service, the starting device, prime movers, or powered accessories shall be tagged out in accordance with the clearance procedure. Personnel shall be alerted to the hazard of stored energy, which may exist after the power source is out.
- ◆ Do not use the emergency stop cable in lieu of clearance procedure.
- ◆ Replace all safety devices and guards before starting equipment for normal operation.
- ◆ Report missing or defective safety devices or guards to your supervisor.
- ◆ Never start a conveyor until all personnel in the area are alerted by a signal or designated person that the conveyor is about to start.
- ◆ Never obstruct a stopping or starting device that is critical to the safe operation of the conveyor.
- ◆ Never ride a conveyor.
- ◆ Do not cross over a conveyor belt, except at walkways, unless the conveyor's energy source has been deenergized and properly tagged out.

- ◆ Know the location and operation of stopping devices.
- ◆ Ensure any loose hair, loose clothing, jewelry or other possibilities of entanglement are kept away from a moving conveyor.

CRANES

TVA-TSP-18.802

- ◆ Only certified operators shall operate cranes.
- ◆ Ensure crane has been inspected by qualified personnel prior to use.
- ◆ The crane operator has the ultimate authority of the lift and determination of safe lift criteria.
- ◆ During crane operation, if any equipment is suspected to be damaged, stop operation immediately and inspect equipment.
- ◆ Maintain clear communication with signal person at all times.
- ◆ Take appropriate care to access cab, bridge and/or walkway of cranes.
- ◆ Before operating the crane/hoist, perform the required inspection.
- ◆ Never exceed the load capacity of the crane or hoist as determined from appropriate load charts.
- ◆ Never alter or override any safety devices.
- ◆ Take necessary precautions to avoid two-blocking a crane.
- ◆ If any guards have been removed or damaged, do not operate the crane.

Mobile Cranes

- ◆ When working near overhead lines, use caution. Ensure necessary clearances are maintained and consider possible movement of lines from wind.
- ◆ Suspend mobile crane operations during inclement weather in accordance with TVA-TSP-18.802.
- ◆ Before extending outriggers, ensure area is clear of obstructions and manufacturer requirements are met.
- ◆ Ensure outrigger shoring is adequate for the situation.
- ◆ Before mobile crane set-up, determine site conditions (e.g., cable trenches, pipes, underground tanks, soil condition).
- ◆ Ensure the swing path of the load and counterweight are free of obstructions.
- ◆ Use extreme caution when traveling with a suspended load (e.g., load position, boom location, ground support, travel route, speed of movement).
- ◆ Ensure stowed jib boom is attached properly.
- ◆ Follow manufacturer's recommendations when assembling/disassembling boom/jib.

DRILLING OR CHIPPING IN CONCRETE

TVA-TSP-18.803

- ◆ Before drilling and chipping in concrete, Drilling and Chipping in Concrete Form 17717 shall be completed and precautions and instructions implemented to ensure safe work execution.
- ◆ Prior to beginning any drilling or chipping in concrete, ensure any nearby sensitive equipment is protected from the dust.
- ◆ When drilling or chipping in concrete and the location of embedded objects is unknown or uncertain, take precautions to be insulated from contact with an energized electrical source.
- ◆ Drilling and chipping in concrete may pose a silica exposure hazard. Refer to TVA-TSP-18.913 to ensure personnel are properly protected.

EMERGENCY SHOWERS AND EYEWASH

TVA-TSP-18.303

- ◆ Ensure emergency showers, eyewash, or other deluge systems are provided, accessible and operational in areas where acid, caustic, or other hazardous chemicals are used, stored, or handled and the possibility of spillage exists.
- ◆ The minimum size of a portable eyewash unit is a six gallon, 15-minute unit.
- ◆ Keep eyewashes and emergency showers free of any obstructions accessible from at least two directions.
- ◆ Showers and eyewashes shall be marked with highly visible location signs.

ENERGIZED EXPOSED ELECTRICAL EQUIPMENT

TVA-TSP-18.1021

- ◆ Electrical lines and equipment are considered energized unless properly cleared and verified.
- ◆ Always assume a circuit is energized until proven de-energized with an approved voltage test device.
- ◆ Only electrically qualified employees may work on exposed, uninsulated energized electrical lines, conductors or equipment.
- ◆ Two persons are required to be present for certain work on exposed circuits or equipment energized at more than 600 volts in accordance with TVA-TSP-18.1021, Section 3.1.1.
- ◆ Install barriers around the work area when guards are removed from energized equipment at 50 volts or greater to prevent employees who are not working on the equipment, but who are in the area, from contacting the exposed energized parts.
- ◆ Use manufactured, insulated hand tools constructed in accordance with ASTM F1505 or International Electric Code standard 60900 when working on energized parts greater than 50 volts and up to 1000 volts.
- ◆ Wear insulated rubber gloves when accidental contact with energized conductors or parts operating at greater than 50 volts is possible.
- ◆ Minimum approach distances are in the following table.

Minimum Approach Distances

Volt range phase to phase (kV)	Phase to ground exposure(feet-inches)	Phase to phase exposure (feet-inches)
.05 to .300	Avoid contact	Avoid contact
.301 to .750	1 - 1	1-1
.751 to 5.0	2-1	2-1
5.1 to 15.0	2-2	2-3
15.1 to 36.0	2-7	3-0
36.1 to 46.0	2-10	3-3
46.1 to 72.5	3-4	4-0
72.6 to 121.0	3-9	4-8
121.1 to 145.0	4-4	5-5
145.1 to 169.0	4-10	6-5
169.1 to 242.0	6-8	10-2
242.1 to 362.0	11-3	18-2
362.1 to 420.0	14-0	22-5
420.1 to 550.0	16-8	27-1
550.1 to 800.0	22-7	37-5

EXCAVATIONS AND TRENCHING

TVA-TSP-18.804

- ◆ Prior to beginning an excavation, an Excavation Permit shall be issued. TVA Form 29205 is used for generating facilities and Form 20958 is used for non-generating facilities.
- ◆ Identify underground installations before digging.
- ◆ A competent person shall be trained and designated to evaluate and monitor all excavation work.
- ◆ Do not work in excavations where water has accumulated or is accumulating without protective measures being in place.
- ◆ Excavations shall be inspected daily by a competent person for evidence of any hazardous conditions such as potential cave in or hazardous atmosphere. Results of the inspection shall be logged on the excavation permit.
- ◆ Before employees are allowed to enter an excavation over four feet deep, the competent person shall have inspected the trench and verified:
 - the shoring/shielding or sloping system meets the requirements for safe entry
 - no hazardous atmospheres exist
 - adequate means of egress are in place at least every 25 feet in the excavation
 - adequate warnings, barricades, or stop logs are in place if mobile equipment is being operated adjacent to the excavation
 - excavated material and equipment are positioned at least two feet from the edge of the excavation

- ◆ Never go beyond the confines of a trench box or beyond areas that have been shored.
- ◆ Do not operate mobile equipment near the edges of trenches. Barricade areas around trenches to keep mobile equipment from coming too close to the edge of the trench.
- ◆ The excavation spoil shall be kept two feet or greater from the edge of the trench.

FALL PROTECTION

TVA-TSP-18.305

- ◆ Identify work activities that have the potential for personnel to fall from heights.
- ◆ Do not expose yourself to a fall of four (4) feet or more, Use one or more of the following fall protection systems:
 - Guardrail System
 - Ladders / Platforms
 - Personal Travel Restriction System
 - Positioning Device System
 - Personal Fall Arrest System
- ◆ Inspect fall protection equipment for visible damage and current inspection tag/markings (as applicable) prior to each use.
- ◆ Use personal fall arrest equipment only in the manner for which the manufacturer intends it.
- ◆ Do not tie or connect two lanyards together or fasten two snap hooks together to lengthen a lanyard.
- ◆ Do not connect a double-locking snap hook to a carabineer.

- ◆ Connect the carabineer to the round metal ring at the base of the snap hook or connect the carabineer through the nylon webbing at the base of the snap hook.
- ◆ Protect lanyards and lifelines from sharp edges of beams and other objects.
- ◆ Remove lanyards from the harness or secure it on the person to prevent entanglement when not in use.
- ◆ Ensure workers below work performed at elevated positions are protected from falling tools or debris. If there is a danger of tools, materials, debris or equipment falling and striking employees below, then use safety signage and barricades to protect workers below.
- ◆ Use connecting components that meet the following requirements:
 - Use lanyards that have double locking snap hooks. Lanyards without a deceleration device shall be used for fall restraint or work positioning only.
 - Use the proper length of lanyard to prevent a fall or keep a fall to a minimum. Lanyards shall be of the length necessary to limit falls to less than 4 feet.
 - Use controlled descent and retractable lanyards made of dielectric or nonconductive material when there is a possibility of contact with energized electrical conductors.

Guardrail Systems

- ◆ Use guardrail systems whenever practical to eliminate fall hazards.
- ◆ Use guardrail systems that comply with the following requirements:
 - Top rails that are 42 inches (\pm) 3 inches above the walking/working surface. The top rail shall be capable of withstanding, without failure, a force of at least 200 pounds in any outward or downward direction, at any point along the top rail.
 - When wire rope is used for top rails, flag it at not more than 6-foot intervals with high-visibility material.
- ◆ Frequently inspect wire, manila, plastic or synthetic rope being used for top rails as necessary, to ensure it continues to meet strength requirements.
- ◆ Install mid-rails midway between the top rail and the walking/working surface. The mid-rail shall be capable of withstanding, without failure, a force of at least 150 pounds applied in any outward or downward direction, at any point along the mid-rail.
- ◆ Use of screens and mesh, when deployed, shall extend from the rail to the walking/working surface and along the entire opening between top rail supports. The screen or mesh shall be capable of withstanding, without failure, a force of at least 150 pounds applied in any outward or downward direction at any point along the mid-rail.

FIRE/FIRE EXTINGUISHERS

TVA-TSP-18.1207

- ◆ Know the emergency reporting process at your facility and immediately report all smolders or fires to the designated emergency number.
- ◆ Be prepared to provide the following information:
 - Your name
 - Location of the fire.
 - Type and extent of fire.
 - Injured personnel, if any
- ◆ Only attempt to extinguish fires using portable fire extinguishers if the fire is small, you know how to safely use the fire extinguisher, and you feel comfortable attempting to extinguish the fire.
- ◆ Always leave a safe way out if you attempt to extinguish a fire.
- ◆ When using a fire extinguisher, remember **PASS**.
 - **P**ull the pin.
 - **A**im low at the base of the fire.
 - **S**queeze the lever above the handle.
Release to stop the flow.
 - **S**weep from side to side, moving toward the fire and maintaining aim low at the base of the fire.
- ◆ Burning materials and fire extinguishers may create an unsafe breathing environment in an enclosed location.
- ◆ Know the location of fire extinguishers in your area.
- ◆ Never block access to fire extinguishers.
- ◆ Always evacuate the building when an alarm sounds unless assigned firefighting or floor warden tasks.

FLOTATION DEVICES

TVA-TSP-18.306

- ◆ Wear personal flotation devices (PFDs) of the appropriate U.S. Coast Guard Type when not protected by standard guardrails or continuous fall protection at the following locations:
 - On flotation pipelines, pontoons, rafts, or float stages.
 - On open decks of barges or tugs.
 - On structures extending over or adjacent to water.
 - In skiffs, small motor boats, or launches (except when inside an enclosed cabin or wheelhouse).
- ◆ Ensure the PFD is the proper size and fit and inspect it before use.
- ◆ Ensure that the PFD will support your weight and the weight of attached equipment and clothing that is wet and/or water-filled.
- ◆ Use of buoyant cushions not permitted.

FORKLIFTS

TVA-TSP-18.805

- ◆ Never operate a forklift unless properly trained.
- ◆ Inspect forklifts prior to use.
- ◆ Where forklifts are used around the clock, inspect them each shift.
- ◆ If conditions are identified that adversely affect the safe operation of the forklift, tag the forklift with a “DANGER - Do Not Use” tag, initiate actions to

correct the deficiency and do not use the forklift until it is repaired.

- ◆ Know the load capacity of the forklift. Lift only loads within the rated capacity of the forklift.
- ◆ Place the forks under the load as far as possible. Tilt the load back carefully.
- ◆ Lift only stable or safely arranged loads.
- ◆ While driving a forklift on a truck or trailer:
 - Block the wheels of the truck or trailer.
 - Check the floor of the truck or trailer for breaks or weaknesses prior to entry with the forklift.
- ◆ Always look in the direction of the path of travel when operating a forklift.
- ◆ Do not operate forklifts near the edge of unprotected loading docks, ramps and platforms.
- ◆ Slow down and sound the horn at cross aisles or corners when view is obstructed.
- ◆ Never alter the forks and use only approved devices for lifting.
- ◆ Ascend and descend grades slowly. If the grade is in excess of 10 degrees, drive the loaded forklift with the load upgrade.
- ◆ On all grades, tilt the load back and raise only as far as necessary to clear the road surface.
- ◆ Operate forklifts at speeds that will ensure a safe stop.
- ◆ No passengers are allowed on forklifts.
- ◆ Seatbelts shall be worn.
- ◆ Keep others clear of the load.
- ◆ Do not defeat any factory installed safety device.

- ◆ Use a spotter while using “extended height” equipment especially in the area of energized power lines and overhead obstructions.
- ◆ Cell phones shall not be used while operating a forklift.
- ◆ Pedestrians have the right of way.
- ◆ When a forklift is left unattended, forks shall be fully lowered, controls placed in neutral, power shut off, and the brakes set.
- ◆ Do not operate a forklift on any grating unless it is certain the grating can support the load.
- ◆ Personnel can only be lifted by forklifts when all the requirements in TVA-TSP-18.805 are met.

Parking Requirements

- ◆ When possible, select a flat parking surface, where the vehicle does not block doors, pedestrian routes, aisles, exits, etc.
- ◆ Block the wheels if a forklift is parked on an incline.
- ◆ Lower forks fully, place controls in neutral, set the brakes and shut off power.

GRINDING AND CUTTING

TVA-TSP-18.710

- ◆ Before use, inspect the grinder for defects, guard alignment and proper wheel rating.
- ◆ Remove defective grinders from service immediately.
- ◆ Ensure wheel fits freely on the spindle and nut is only tightened enough to hold the wheel in place. Over

tightening the nut could crack the wheel and cause it fly apart.

- ◆ Before mounting a new wheel on a grinder, ensure that it is rated for the maximum operating speed of the grinder.
- ◆ Operate the abrasive wheel with guard in place for one minute before applying the wheel to the work. Stand away from the grinder during test operations.
- ◆ Wear safety glasses or goggles with a face shield along with gloves, long sleeves and a hard hat.
- ◆ Never use a portable grinder without a handle. If you cannot use the handle, contact your supervisor.
- ◆ Never use a grinding tool without a guard. If a guard must be removed to complete a task, contact your supervisor to ensure a job safety analysis is completed and proper precautions and PPE is in place.
- ◆ After completing a grinding operation, remove PPE with care. Vacuum clothing and PPE when possible. Tilt head forward when removing hard hats and eye protection to prevent debris from falling into the eyes.
- ◆ Never pull or carry a grinder by its cord.
- ◆ Keep cords and hoses away from heat, oil and sharp edges.
- ◆ A constant pressure switch must be used on grinders. Lock on controls are allowed as long as turn off can be accomplished with one single motion.
- ◆ Disconnect grinders when not in use.
- ◆ Set up screens to protect other workers.

GUARDING FLOOR AND WALL OPENINGS

TVA-TSP-18.605

- ◆ Every temporary floor opening shall have standard railings, or shall be constantly attended by someone.
- ◆ Guard floor holes into which persons can accidentally walk by either a standard railing with standard toeboard on all exposed sides, or a floor hole cover of standard strength and construction. While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing.
- ◆ Every floor hole into which persons cannot accidentally walk (because of fixed machinery, equipment, or walls) shall be protected by a cover that leaves no openings more than 1-inch wide. The cover shall be securely held in place to prevent tools or materials from falling through.
- ◆ Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width to less than 20 inches.
- ◆ Guard every temporary wall opening with adequate guards. Every wall opening from which there is a drop of more than 4-ft shall be guarded by a rail, roller, picket fence, half door, or equivalent barrier or extension platform onto which materials can be hoisted for handling, and which shall have side rails or equivalent guards of standard specifications

HEAT STRESS

TVA-TSP-18.906

- ◆ Know the key elements to preventing heat related illnesses.
 - **Hydration** - before, during and after work activities
 - **Evaluation** - of environmental conditions, personal health, work demands and clothing to set a safe stay time.
 - **Awareness** - of signs and symptoms of heat related illness in yourself and co-workers.
 - **Time** - never exceed stay time or personal capabilities.

- ◆ Recognize that the ability of an individual to tolerate heat is dependent upon factors such as the following:
 - Age and lifestyle
 - Chronic health conditions
 - History of heat exposure / acclimation
 - Current or recent acute illnesses

- ◆ Use engineering controls as the first line of defense to protect personnel from heat stress. Examples of engineering controls include, but are not limited to:
 - Fans, blowers or ducted air conditioned air
 - Air conditioned cubicles
 - Radiant heat shields
 - Shutdown/cool-down of the plant or plant components, if necessary

- ◆ Use work controls to adjust the way work is done to limit heat exposure and the effects of heat stress. Examples of work controls include, but are not limited to:
 - Acclimatization to heat
 - Personal monitoring
 - Action/check times
 - Work-rest regimens
 - Scheduling and crew size
 - Buddy system
 - Self determination
- ◆ Drink 5 to 7 ounces of cool fluids every 15 to 20 minutes when working in a heat stress environment.
- ◆ Do not depend on thirst as a signal for when to drink.
- ◆ Avoid sugary drinks and caffeine.
- ◆ Follow stay times and work/recovery regimens.
- ◆ Recognize and understand the signs and symptoms of heat related disorders.
- ◆ Intervene if you observe signs of heat related illness in a co-worker.
- ◆ Inform your supervisor of any known health conditions that could adversely affect your ability to tolerate the heat.

Evaluation

- ◆ In environments where the adjusted wet bulb globe temperature exceeds 82 degrees Fahrenheit, TVA-TSP-18.906 applies and shall be followed, if the area meets the definition of a high-heat stress area (90° F and greater WBGT)

- ◆ Supervisors/foreman or other properly trained personnel shall evaluate the work and establish stay times in accordance with the procedure.
- ◆ The individual is most knowledgeable concerning his day-to-day physical condition and is expected to communicate this information during the Heat Tolerance Screening.
- ◆ Contact a TVA safety consultant when necessary for guidance or assistance.

HEAVY EQUIPMENT TVA-TSP-18.711

- ◆ Do not operate heavy equipment unless you are trained and qualified.
- ◆ Conduct daily shift inspections on equipment before use.
- ◆ Know the specific hazards, operating instructions and limitations of the equipment you are operating.
- ◆ Ensure the equipment manufacturer's instruction manual, including applicable build sheets, are in the machine. Refer to it whenever any doubts concerning operating procedures arise. Consult with your supervisor/foreman in the event the manual does not cover a specific situation.
- ◆ Understand hazards of the work environment such as nearby power lines and location of underground utilities when operating heavy equipment.
- ◆ Move equipment on plant/site roadways during the daylight whenever possible.
- ◆ Never jump from the equipment to the ground.

- ◆ Never dismount the equipment while the equipment is in motion.
- ◆ Use handholds and steps to climb on and dismount the equipment.
- ◆ Keep steps and running boards clean of ice, mud, grease, and oil.
- ◆ Before moving earth-moving equipment, make certain that no other personnel or equipment is in the danger area around the equipment. Walk around the machine before starting.
- ◆ Operate machines at normal speeds for the machines and in a manner consistent with conditions of the job.
- ◆ Drive slowly off the shoulders of roads to avoid the sudden dropping of one wheel, which could cause a sudden tilting.
- ◆ When parking a machine, shut off the engine, drop bowls or blades and lower other attachments to the ground.
- ◆ Never leave a running machine unattended.
- ◆ Do not allow other personnel to ride on equipment while the equipment is in motion, except for training purposes, and then only when a seat is provided.
- ◆ Do not climb on equipment in motion.
- ◆ Do not use cell phones during the operation heavy equipment. This includes talking, texting or use of any applications which may be on the phone.
- ◆ Exercise extra caution when operating heavy equipment in congested areas. Identify specific hazards prior to work and implement mitigation measures such as barricades, vested flaggers, etc.

to prevent injury to personnel or damage to equipment and structures.

- ◆ When lifting loads with heavy equipment, follow manufacturer instructions, including load charts.
- ◆ When refueling in the field, the equipment must be shut off and an operator must stand by with a fire extinguisher.
- ◆ If field maintenance is required, set the brakes, secure the boom, lower the dipper or bucket to the ground, take the machine out of gear, and take other appropriate actions to prevent accidental movement.
- ◆ When parking heavy equipment, set the brakes, land blades and/or buckets on the ground and place shift lever in neutral before leaving the equipment in the field at the end of the work shift. Wheeled equipment shall have the wheels blocked if the equipment is parked on a grade. All electrical systems shall be disconnected along with the master switch, if provided.
- ◆ Tires shall only be changed by heavy equipment mechanics who are familiar with safety precautions.

HOT WORK AND IGNITION CONTROL

TVA-TSP-18.1204

- ◆ All hot work performed outside of designated shop or hot work areas requires TVA Form 6561A, Hot Work Permit.
- ◆ Wear protective clothing while performing welding related activities.
- ◆ Inspect all equipment before use.

- ◆ When working in the vicinity of welding operations, wear flash goggles. If necessary to look directly at the weld, use a welding hood.
- ◆ Protect others when they may approach within 75 feet of an arc-welding location by erecting portable screens.
- ◆ Turn off all welding equipment when not in use.
- ◆ Do not place material that is being cut or welded directly on a concrete floor.
- ◆ Cool or clearly mark hot material before leaving it unguarded.
- ◆ Hot work on or near hazardous materials may require special respiratory protection and ventilation. Contact your safety consultant or supervisor if in doubt.
- ◆ When performing hot work that involves cadmium, lead or hexavalent chromium, follow the appropriate TVA procedure. (TVA-TSP-18.904, Cadmium, TVA-TSP-18.909, Lead and TVA-TSP-18.915, Hexavalent Chromium)
- ◆ Use approved welding blankets, welding pads or equivalent as necessary to protect combustibles and cracks in walls, floors and ducts.
- ◆ Do not weld or cut in areas containing combustible gases, vapors or dusts until safeguards have been implemented to prevent fire or explosions.
- ◆ No open flames are allowed near welding.
- ◆ Do not weld or solder on any vessel or tank which may have contained flammable or explosive substances until the vessel has been properly

purged or otherwise handled with special procedures.

- ◆ When performing hot work from an elevated location, barricade or close off the area below and take precautions to prevent hot slag from falling onto personnel or combustible materials.
- ◆ Where a fire watch is necessary, the fire watch shall:
 - Be currently trained to understand the inherent hazards of the work site and of the hot work.
 - Have fire extinguishing equipment readily available that is to be properly rated, inspected, and adequately sized for the task involved. Fire watches shall not remove permanently installed fire extinguisher for fire watch duties.
 - Be permitted to perform additional tasks, but those tasks shall not distract them from their fire watch responsibilities.
 - Maintain surveillance in the work area to detect and extinguish smoldering fires, only when the fires are within the capacity of the equipment available. If the fire is not within the capacity of the equipment, the fire watch shall sound the fire alarm immediately.
 - Have the responsibility to make certain the hot work area is maintained in a fire-safe condition and has the authority to stop the hot work if unsafe conditions are observed.
 - Understand the basic hazards of any combustible construction involved with the

- hot work area and the hazards associated with the occupancy.
- Understand the fire exposure hazard that hot work creates to occupancies adjacent to or below the hot work operation.
 - Understand the need to maintain proper isolation of all hot work operations from combustible or flammable materials.
- ◆ The fire watch duration after the completion of hot work is specified below:
- The fire watch shall be maintained for at least 30-minutes after completion of hot work operations.
 - In areas with combustible dust potential, including coal handling, the fire watch shall be maintained for not less than 2-hours after completion of hot work operations.

JOB SAFETY ANALYSIS (JSA)

TVA-TSP-18.006

- ◆ Use the JSA form to break down the steps of the job, identify the potential hazards associated with each step and determine the best way to control the hazards.
- ◆ Review all work in the area and adjacent areas to determine how each job or evolution affects workers in the area.
- ◆ Look at past incident experience while conducting the same or similar work activities when developing JSAs.

- ◆ Conduct a JSA shall for work that is considered potentially hazardous, high risk, or complex.
- ◆ JSAs that are on file shall be reviewed and updated when there is a change to personnel, processes, equipment, or materials that may introduce new hazards to the job.
- ◆ JSAs shall be reviewed by a knowledgeable person who did not participate in the development of the JSA.
- ◆ Review the JSA during the pre-job brief.

LADDERS

TVA-TSP-18.712

- ◆ Inspect all portable ladders before use for the following:
 - Free from foreign material to allow visual inspection and reduce possibility of slip hazard to user.
 - Joints between the rungs and side rails are tight and rungs are not damaged.
 - Hardware and fittings are securely attached.
 - Movable parts operate freely without binding or excessive play.
 - Metal bearings of locks, wheels, pulleys, etc., are lubricated.
- ◆ Never “walk” a ladder while standing on it.
- ◆ More than one person shall not use a ladder at a time unless specifically designed for that purpose.
- ◆ Never climb higher than the second step below the top step on portable ladders.

- ◆ Remove defective ladders from service and tag defective until repaired or destroyed.
- ◆ Never reach more than an arms length from a ladder.
- ◆ Know the ladder load capacity and do not overload the ladder.
- ◆ Be sure shoes are free of mud and oil to avoid slips.
- ◆ Always face the ladder when ascending or descending and maintain three points of contact.
- ◆ Never place ladders on boxes, barrels or other unstable surfaces.
- ◆ Do not use metal ladders in locations where they may come in contact with electrical conductors. Special work requiring metal ladders in the 500 kV yards must be approved by supervision prior to beginning work.
- ◆ When using a ladder in front of a door, ensure the door is open, locked, guarded or barricaded.
- ◆ Secure ladders to prevent them from becoming dislodged which could cause personal injury or damage to plant equipment or structures.
- ◆ Return ladders where they were obtained properly store them after use.

Portable Straight Ladders

- ◆ Use portable straight ladders with non-skid bases.
- ◆ Use correct set-up angle or pitch by placing the ladder so the distance between the bottom support of the ladder and the top support is no less than approximately one-fourth of ladders working length.

- ◆ Before working from a portable straight ladder, securely place and hold, tie or otherwise make the ladder secure to prevent slipping or falling.
- ◆ Ensure the ladder extends at least 3 feet above the working surface.
- ◆ Do not splice short ladders together to form a longer ladder.
- ◆ Extension ladders shall not be split apart to make separate ladders.

Step Ladders

- ◆ Use step ladders with legs fully extended and spreader locked to hold the front and back sections of the ladder open when ladder is in use.
- ◆ Ensure firm level footing of ladder legs.
- ◆ Do not use a step ladder as a straight ladder.
- ◆ Use step ladders with non-skid bases.

ERGONOMIC GUIDELINES/LIFTING/HANDLING MATERIALS

TVA-TSP-18.604

- ◆ Plan the work in advance. Consider the size, shape, weight and weight distribution of materials to be handled to determine the most efficient and safest method to accomplish the task.
- ◆ If the load is being lifted manually and weighs more than 50 pounds, a JSA is required.
- ◆ When a load exceeds 50 pounds, consider the use of mechanical equipment to accomplish the lift. If this is not possible, consider the use of two or more people to reduce the risk of injury. When more than two

people are used, good coordination and planning of the lift is essential to prevent injury.

- ◆ Use the proper tools and wear the proper PPE for the task.
- ◆ Consider alternate methods to reduce the risk of injury.
- ◆ Select employees so that work assignments match the worker to the job in terms of knowledge and physical abilities.
- ◆ Review unusual or high-risk operations to ensure that hazards are mitigated.
- ◆ Ensure that when more than one person is involved in lifting, materials are moved in unison.
- ◆ Coordinate lifts so each employee should be alert for what the others are going to do and when.
- ◆ Establish a safe travel path before moving materials.
- ◆ Where grating is present, ensure the load capacity of the grating can withstand the intended load.
- ◆ Be aware of body position and position of extremities. Keep body parts out of the line of fire and away from pinch points
- ◆ When lifting, holding, or pushing, avoid strains and sprains caused by incorrect posture, incorrect lifting techniques, lack of proper assistance and/or lack of lifting aids.
- ◆ Know your limitations. Get help when needed.

Lifting

- ◆ Inspect the object before lifting to ensure there are no nails, staples, oil, grease or other hazards associated with item to be lifted.

- ◆ Test the weight of the load before lifting. Let your arms and legs do the work, not your back.
- ◆ Keep the load close to your body.
- ◆ Bend your knees and hips and lift with your legs.
- ◆ Avoid twisting as you lift.

Bending

- ◆ Kneel on one knee. Use knee pads if performing repeated kneeling.
- ◆ Bend knees and hips, not your back.

Repetitive motions

- ◆ Keep the load small.
- ◆ Turn your whole body instead of twisting.
- ◆ Keep the load close to your body.
- ◆ Change positions frequently.

Reaching

- ◆ Reach only as high as is comfortable; do not stretch.
- ◆ If you need to reach beyond your comfort level, use a ladder.

Pushing and Pulling

- ◆ Stay close to the load; do not lean forward.
- ◆ Push the load rather than pulling.
- ◆ Use both arms.

Material Transport

- ◆ Appropriately secure all transported materials.

- ◆ Inspect load before and after transporting.
- ◆ Safely load and configure materials so they can be safely unloaded.

MATERIAL HANDLING EQUIPMENT

TVA-TSP-18.616

- ◆ Inspect equipment before use to ensure there are no defects and the rated capacity/safe working load is readily visible. Tag defective equipment and remove from service.
- ◆ Make yourself familiar with the selected equipment before the work begins.
- ◆ Ensure that adequate clearances are observed to prevent being struck, caught, or pinned by moving loads or material handling equipment.
- ◆ Position hand trucks and hand-operated forklift trucks a safe distance from personnel in the area prior to lowering the load.
- ◆ Adhere to rigging/hoisting equipment capacities.
- ◆ Remove jack handles whenever possible, and when not in use. Jacks shall be level and set on firm footing.
- ◆ Avoid manually lifting heavy objects overhead.
- ◆ Stack materials at approximately waist height.
- ◆ Ensure the load is properly secured when transporting any material or equipment utilizing handcars.
- ◆ Ensure all carts are labeled with max load ratings before use.

- ◆ Follow TVA-TSP-18.616, Appendix A when transporting loads greater than 75 pounds. Review this information in pre job briefs.

MOWERS

TVA-TSP-18.715

- ◆ Use the correct mower for the job. Use walk behind mowers or specially designed slope mowers for inclines greater than a three to one ration (3:1).
- ◆ Cell phones shall not be used during the operation of mowers. This includes talking, texting or use of any applications which may be on the phone.
- ◆ Read or review the operator's manual to familiarize yourself with the machine.
- ◆ Wear proper PPE.
- ◆ Learn the location and use of controls, gauges, and dials for the tractor.
- ◆ Familiarize yourself with speeds, slope capabilities, braking and steering characteristics, and tractor-mower clearances.
- ◆ Check that the power take off, mower input driveline, drive belts, chains, and gears are all properly guarded. Repair or replace if necessary.
- ◆ Check the discharge chute to see that it is in place and pointed downward.
- ◆ Fill the fuel tank outdoors with the engine stopped and cool. Do not smoke while filling.
- ◆ If you will be driving on public roads, be sure the slow moving vehicle emblem is in place. Check that the warning lights are present and operating.

- ◆ Inspect the work area for debris, ditches, potholes, stumps, irrigation valves, etc. Clear removable items and mark others.
- ◆ Do not tamper with the blade while the mower is running.
- ◆ Avoid holes and obstacles, such as stones, rocks, or stumps.
- ◆ Slow down when vision or visibility is limited or when operating on rough ground.
- ◆ Never remove guards or safety devices unless required for maintenance and then replace before returning the mower to service.
- ◆ Disable the mower engine before inspecting, adjusting, or changing attachments.
- ◆ Wear gloves shall when handling mower blades.
- ◆ Keep feet away from the blade when starting the mower.

OFFICE SAFETY

TVA-TSP-18.611

- ◆ Know the location of emergency exits in your area.
- ◆ Inspect electrical cords for damage before use.
- ◆ Do not connect multiple electrical cords and power strips.
- ◆ Do not connect small appliances and portable heaters to temporary power such as extension cords and power strips.
- ◆ Ensure file cabinets are secured from tipping.

- ◆ Load cabinets from the bottom drawer up with the heaviest items loaded in the bottom to avoid tipping of the cabinet.
- ◆ Do not leave desk drawers and file cabinet drawers open when not in use.
- ◆ Do not carry bulky objects in such a way as to obstruct the view ahead.
- ◆ Clean up water, coffee, and other liquids spilled on floors immediately.
- ◆ Keep aisles clear of tripping hazards.
- ◆ Use ladders or stands provided to reach material on high shelves.
- ◆ Never use office furniture as a substitute for the proper ladder or step stool.
- ◆ Keep aisles and corridors clear.
- ◆ Store materials in a manner that does not create a hazard such as a tripping hazard or fire hazard.

PERSONAL PROTECTIVE EQUIPMENT TVA-TSP-18.302

EYE AND FACE PROTECTION

- ◆ Wear the appropriate eye protection for the job. Reference the table in this section for guidance.
- ◆ Wear a face shield over safety glasses with side shields, monogoggles or spoggles for any task that creates the potential for flying particles, objects or splashed hazardous liquids.
- ◆ Wear the appropriate eye protection if an area is posted with eye protection requirements. Eye protection is required in powerhouses, warehouses, shops, coal handling areas and construction areas. Control rooms, offices, computer rooms, training rooms, lunch/assembly areas, bathrooms and similar areas are exempt.
- ◆ Install barricades or signage around the area to warn others when performing tasks that could result in eye hazards. This includes welding activities where the welding flash poses a hazard.
- ◆ Do not wear dark-tinted lenses indoors except for activities that emit harmful light rays such as welding.
- ◆ Contact lenses are permitted if appropriate eye protection is worn. If chemical protection is necessary when wearing contact lenses, wear chemical goggles.
- ◆ Eye protection shall be used under face shields.
- ◆ Clean and inspect eye/face protection and replace when damaged. Do not modify eye protection.

Eye and Face Protection Selection Guide

Operation	Hazards	Required Protection
Acetylene-burning, cutting, welding	Sparks, harmful rays, molten metal	Welding goggles
Chemical handling	Splash, burns, flying particles	Chemical goggles, face shield for severe exposures
Chipping	Flying particles	Face shield over safety glasses
Electric (arc) welding	Sparks, intense rays, molten metal	Welding helmet with required lens, safety glasses
Energized electrical	Electric arc flash, burns	Tinted face shield over safety glasses
Mowing/weed eating/hammers or other impact tools	Flying objects	Goggles or safety glasses
Grinding and disc cutting/Machining	Flying particles	Face shield over safety glasses
Portable Power Tools	Flying particles	Face shield over safety glasses
Soldering	Molten metal	Face shield over safety glasses
Compressed air	Flying particles	Face shield over safety glasses
Wire and metal band cutting	Flying objects	Safety glasses with side shields

FOOT PROTECTION

- ◆ Maintain shoes and laces in a clean and serviceable condition.
- ◆ Wear footwear designed for industrial work exposures and constructed of substantial materials in industrial areas. Substantial materials are strong, durable materials that provide protection against abrasions, heat, flame, chemical irritants, oils, and limited impact forces. Leather is the most common material that meets the criteria. Soles made out of rubber or other materials that are resistant to oils and chemicals are preferable.
- ◆ All footwear shall have a defined heel up to 1 1/2 inches.
- ◆ Flip flops and similar footwear are limited to showers and locker rooms only.
- ◆ Open toe or high heel shoes, sandals or shoes made of cloth, canvas or similar material are prohibited in any industrial environment.
- ◆ The following areas are typically not considered Industrial work areas:
 - Break areas/cafeterias.
 - Control rooms (including area behind the Control Room panels).
 - Bathrooms/locker rooms
- ◆ Safety footwear is required for employees performing construction, maintenance and material handling work activities. Where safety footwear is required, it shall have a protective toe and meet current ASTM F2413 standards.

HAND PROTECTION

- ◆ Wear hand protection to protect against cuts, punctures, burns, cold, hazardous chemicals, etc. Some examples include:
 - Working with a tool that could slip and cause a hand injury
 - Using a brush to clean metal shavings/cuttings from machining processes
 - Operating valves where there is a possible danger to the hands
 - Sandblasting
 - Handling ropes, slings, chokers, or cables
 - Handling lumber or scaffolding
 - Unpacking or un-bailing packing crates where injury from nail, wire, metal bands, and splinters is possible
 - Handling solvents or corrosives
 - Insulation lagging or canning
 - Electrical trays
 - Electrical cable shielding material
 - Sheet metal
 - Glass
- ◆ Do not wear gloves when working with rotating equipment that may cause a hazard of the glove being caught in the equipment.

HEARING PROTECTION (TVA-TSP-18.908)

- ◆ Hearing protection shall be worn in posted areas.
- ◆ Wear double hearing protection in any posted areas or when performing an activity where single hearing protection is not adequate.
- ◆ A variety of hearing protectors from which employees may choose shall be provided by the facility.
- ◆ Wear hearing protection with a noise reduction rating (NRR) of 28 or greater.
- ◆ Keep hearing protection in clean and sanitary condition.
- ◆ Report any problems wearing hearing protection to your supervisor immediately.

HEAD PROTECTION

- ◆ Wear hard hats in any work area where there are known hazards that may cause a head injury.
- ◆ Wear ANSI-approved hard hats. In power plants, Class E hard hats are required.
- ◆ Do not alter the hard hat's suspension and shell.
- ◆ Do not use paints, solvents, chemicals, adhesives, or petroleum products on hard hats unless approved.
- ◆ Frequently clean and inspect hard hats.
- ◆ Hard hats shall be worn with the brim to the front. Reversed hard hats designed with reversible suspension may be worn by those who frequently attach protective devices such as welding helmets and face shields or when the brim of the hat interferes with proper respirator fit.

- ◆ Replace hard hat when damaged or by the expiration date found inside the hard hat.
- ◆ Only items specifically designed to be worn under hard hats may be worn underneath a hard hat. No baseball or similar caps are allowed.

PORTABLE HEATERS

TVA-TSP-18.719

- ◆ Use safety stands with oil-fired or kerosene-fired space heaters designed for safety stand use.
- ◆ Store heater fuel in an approved, properly labeled, container.
- ◆ Oil-fired or kerosene-fired space heaters:
 - Shall be used only in properly ventilated areas
 - Shall not be operated where flammable vapors or dust presents an explosion hazard
 - Shall be properly maintained and inspected before use
 - Shall not be operated close enough to combustible material or clothing to create a fire hazard
 - Shall not be left unattended while in operation
 - Shall be refueled outdoors
 - Shall not be transported, refueled, or lighted while hot

RAILROAD OPERATIONS

TVA-TSP-18.812

- ◆ Only operate railroad equipment if trained and qualified.
- ◆ Use the locomotive horn before moving to give a warning to employees in the area.
- ◆ Conduct a pre-job brief daily for railroad operations.
- ◆ Observe the 5 mph locomotive speed in the yard and the 10 mph speed on the main line.
- ◆ Maintain adequate distance (at least arm length) from any rotating or moving equipment at all times.
- ◆ When stepping between rail cars, be alert for moving equipment working on adjacent tracks.
- ◆ Immediately report defects or obstructions found on tracks or bridges to your supervisor/foreman. If the contract rail carrier utilizes the tracks in question, the master dispatcher for the railroad company shall be notified.
- ◆ Never crawl under a rail car until clearance precautions have been taken for maintenance or repair.
- ◆ Use three-way communication with the operator and the switchman on repairs.
- ◆ Rail car shall not be moved until the maintenance employee communicates face to face with the locomotive operator and switchman that all work is complete.
- ◆ When the locomotive is in service, never crawl over or between couplings unless clearance precautions have been taken for maintenance or repair.

- ◆ Do not ride on the lead footboard of an engine or sit on handrails, uncoupling rods, or draw heads of engines or rail cars.
- ◆ Any signal, voice, or radio communication that is not fully understood by the train operator shall be considered a stop signal until resolved.
- ◆ Avoid walking or standing on the tracks except in the performance of their assigned duties.
- ◆ All hand, light, or radio signals from the switchman or other employees must be transmitted from a position that can be clearly understood by the engineer from their normal operating position.
- ◆ Ensure that rail car brakes are properly set before leaving them uncoupled from the engine.
- ◆ Do not intentionally roll rail cars.
- ◆ Visitors shall be escorted at all times and shall report to the switchman and operator when leaving the car dumper area.
- ◆ Personal Protective Equipment (PPE) is required for rail car operation which includes hard hat, safety glasses with side shields, gloves, hearing protection, and monogoggles available in case of windy or dusty situations.
- ◆ Cell phones shall not be used during the operation of locomotives. This includes talking, texting or use of any applications which may be on the phone.

REPORTING EVENTS

TVA-SPP-18.013

- ◆ Report injuries, illnesses, near misses and good catches to your supervisor in accordance with TVA-SPP-18.013.
- ◆ Enter all work related injuries and illnesses in the Medgate Reporting module by using the Preliminary Injury & Incident Report (PIIR) found on TVA InsideNet and on the TVA Safety website.

RESPIRATORS

TVA-TSP-18.916

- ◆ Respirators shall be issued and used whenever employees are exposed to harmful concentrations of toxic vapors, gases, dust, or oxygen deficiencies which cannot be controlled by other means.
- ◆ Do not wear a respirator until you are medically cleared, fit tested and have completed required training.
- ◆ Ensure you are clean-shaven on facial areas where the sealing surface of the respiratory device contacts the skin.
- ◆ If prescription glasses are necessary for a full face respirator, use an appropriate mounting frame.
- ◆ Use of contact lenses is permitted with respirator wear the individual has previously demonstrated had successful experience wearing contact lenses.
- ◆ Use only respirators listed as suitable for protection against oxygen deficiency and/or hazardous atmosphere when there is doubt about the hazardous atmosphere.

- ◆ Replace filters when damaged, soiled, or causing noticeably increased breathing resistance (e.g., causing discomfort to the wearer).
- ◆ Monitor physiological condition when using respirators in hot areas (exceeding 80°F WBGT). Reference TVA-TSP-18.906, Heat Stress, for specific monitoring requirements.
- ◆ Conduct user seal checks (fit-checks) each time you wear a respirator.
- ◆ Perform a pre-use visual inspection of respiratory equipment with each use.
- ◆ Do not wear headphones, jewelry, or other articles that may interfere with the face-to-respirator seal.
- ◆ Store respirators properly when not in use, free from damage, contamination, dust, extreme sunlight and stored in a manner which will not damage the facepiece and exhalation valve.

RIGGING

TVA-TSP-18.721

General Safe Work Practices

- ◆ Everyone participating in the lift shall participate in the pre-job brief.
- ◆ Complete TVA Form 20399, TVA Rigging Card before performing lifts.
- ◆ A qualified rigger shall direct rigging activities.
- ◆ Control the Load Drop Zone (LDZ) to prevent unauthorized entry.
- ◆ Never exceed a component's rated capacity.

- ◆ Tag defective rigging with TVA Form 18004, Defective Equipment Tag and remove from service.
- ◆ Inspect rigging equipment prior to use, during use as necessary and after use. Use only rigging equipment that has a current annual inspection.
- ◆ Use only established and approved rigging practices as described in the TVA Rigging Manual and presented in training.
- ◆ Determine an accurate weight before making the lift.
- ◆ Do not weld or alter any rigging devices; only approved rigging devices are to be used.
- ◆ Always establish and maintain clear communications between the rigger and crane operator.
- ◆ Except for emergency stop signals, the crane operator should respond only to the designated signal person.
- ◆ Stop a lift if an unsafe condition is suspected.
- ◆ Never ride a load or the load block.
- ◆ Do not place yourself between loads and stationary objects where there is a potential to be trapped or crushed.
- ◆ Remain outside the LDZ unless specific permission is given by the person in charge to be in the area.
- ◆ Use tag lines to help control the load.
- ◆ Properly store all rigging when not in use.
- ◆ Be aware of pinch points when rigging. Never place hands or fingers between any portion of the rigging and the load.
- ◆ Reference TVA-TSP-18.721A, Rigging Manual, as a tool to assist in safe performance of lifting and rigging activities.

Slings (Wire Rope, Chain, Synthetic)

- ◆ Sling capacity can be affected by the type of hitch used. Use the safest hitch based on the individual load.
- ◆ Protect slings from sharp edges of loads.
- ◆ Mechanical equipment should not be used to pull slings from under loads.
- ◆ Sling angles less than 45 degrees above horizontal are considered Complex Rigging and shall require the use of TVA Form 20403, TVA Rigging Plan.

Shackles

- ◆ Install shackles so the running line does not loosen the pin.
- ◆ Keep shackle pins and bodies as a set.

Hooks

- ◆ Ensure safety latches are installed and operable.
- ◆ Do not point-load the hook.
- ◆ Do not paint hooks.
- ◆ Equally load each side of a sister hook (double hook).

Come Along/Chain Falls

- ◆ Ensure load hooks and attachment hooks have functioning safety latches.
- ◆ Ensure come along/chain falls are clearly marked with the rated capacity.
- ◆ Select come along/chain falls based upon anticipated weight and rigging configuration.

- ◆ Position come along/chain falls in a manner so the chain feeds through without binding.
- ◆ Do not side load hooks.

SIGNS AND BARRICADES

TVA-TSP-18.602

- ◆ Use the correct barricade for the hazard. See the table at the end of this section for guidance.
- ◆ Ensure barricades are set up and maintained in a way that they are an effective warning for workers.
- ◆ Remove the barricade when the hazard no longer exists.
- ◆ Never use barricades constructed of conductive material around an electrical hazard.
- ◆ Employees working inside a barricaded area shall be briefed on the hazards and necessary precautions.
- ◆ Ensure signs are visible at all points of potential access.
- ◆ Signs used with barricades shall identify the person in charge, the hazard, and the contact phone number.

Signal Word	Color	Instructions for Use
Danger	Red	To be used in hazardous situations. Special precautions are necessary to avoid serious injury or death
Danger	Orange	To be used for electrical hazards only. Special precautions are necessary to prevent serious injury or death.
Danger	Yellow/Magenta	Radiation
Caution	Yellow	To be used to warn of potential hazards or to caution against unsafe practices that could result in minor or moderate injury.

SCAFFOLDS AND TEMPORARY WORK PLATFORMS

TVA-TSP-18.813

- ◆ Do not erect or dismantle scaffolds and temporary work platforms unless properly trained.
- ◆ A scaffold permit is required for all scaffolds over four feet high.
- ◆ Remove scaffolds when no longer needed.
- ◆ Maintain scaffolds shall be maintained in a safe condition.
- ◆ Scaffolds shall be sound, rigid and capable of supporting the maximum intended load without settling or shifting.

- ◆ Do not work from any scaffold over four feet high that has not been inspected by a competent person and does not have a scaffold permit attached. Permit tags shall be consistent with the following color scheme:
 - Green - Complete scaffold, no fall protection required
 - Yellow - Incomplete scaffold - fall protection required
 - Red - Do not use
- ◆ Keep platforms clear of debris, ice and snow.
- ◆ An access ladder or safe access point shall be present on all scaffolds.
- ◆ Use a tag line when hoisting material onto a scaffold.
- ◆ Install overhead protection on scaffolds when workers are exposed to overhead hazards.
- ◆ Do not attach scaffolds to plant equipment without prior approval.
- ◆ Nuclear Power Group employees shall reference MMTP-102 for scaffold requirements.

TEMPORARY ELECTRICAL AND USE OF POWER STRIPS

TVA-TSP-18.1004

- ◆ Do not use extension cords as permanent wiring.
- ◆ Ensure all extension cords and power strips have the current color-coded inspection.
- ◆ Inspect extension cords and power strips before every use. Discard any cords that are damaged.
- ◆ Keep cords unwound and free of kinks when in use.

- ◆ Never run a cord under a rug or heavy furniture.
- ◆ When possible, run extension cords in low traffic areas. Protect cords from damage and personnel from tripping in heavy traffic areas.
- ◆ Temporary electrical power and lighting installations are only permitted for a period not to exceed the duration of the task.
- ◆ Interconnecting power strips either with an extension cord or multiple power strips is prohibited.
- ◆ Extension cords shall be approved (e.g. UL Listed) and suitable for conditions of use, load rating, location, and length.
- ◆ Use a ground fault circuit interrupter (GFCI) with 120 volt A/C portable lights and electrical tools operated in wet, moist and conductive environments.
- ◆ Do not use an extension cord or power strip to power appliances with high power loads such as coffee makers, microwaves and portable heaters.

TOOL SAFETY

TVA-TSP-18.606

General Safe Work Practices

- ◆ Use the right tool for the job and keep tools in good condition.
- ◆ Inspect tools for damage or defects before use. If defects are found, repair the tools prior to use, or remove from service and tag as defective.
- ◆ Keep impact tools, such as wedges and chisels, free of mushroomed heads.
- ◆ Keep wooden handles of tools free of splinters or cracks and keep the handles tight in the tools.

- ◆ When removing chips and shavings from operating machinery, use a chip removal tool that will keep hands clear of the chips.
- ◆ Never use a “cheater” bar to extend the handle of a hand tool.
- ◆ Where guards are provided on a tool, they shall be properly installed and in good condition.
- ◆ Never use excessive force with tools.
- ◆ Any modified or fabricated tools shall be in accordance with TVA-TSP-18.606.
- ◆ Use the proper PPE for the tool being used.
- ◆ Store tools properly and in a manner that does not create a hazard. For example, remove or guard blades and bits to prevent cuts and puncture wounds.

Electric Tools

- ◆ Do not carry, raise or lower tools by the cords.
- ◆ Disconnect tools when not in use or before servicing.
- ◆ Inspect the power receptacle before plugging in an electric tool.
- ◆ If an extension cord is used with an electric tool, it shall be of the proper size for the load likely to be imposed.
- ◆ Electric tools shall have a plug equipped with a ground prong, or be a double-insulated type.
- ◆ Do not use electric tools or equipment around flammable gases, vapors, liquids, combustible dusts and ignitable fibers unless they are approved for this type of use or measures are taken to prevent hazardous conditions from developing.

Fuel Powered Tools

- ◆ Turn off fuel powered tools and allow time to cool off before refueling and servicing.
- ◆ Refuel in a well ventilated area.
- ◆ When using fuel powered tools in enclosed spaces, evaluate for atmospheric hazards.
- ◆ Store fuel powered tools in well-ventilated areas.

Power Actuated Tools

- ◆ Employees shall be trained in the operation of powder actuated tools and authorized in their use.
- ◆ Always wear the proper PPE.
- ◆ Prior to use, test power actuated tools in accordance with the manufacturer's recommendations to ensure safety devices are in proper working condition.
- ◆ Load tools just prior to the intended firing time. Never leave a loaded tool unattended.
- ◆ Point tools away from employees.
- ◆ Keep hands clear of the barrel.
- ◆ Never leave power actuated tools unattended.
- ◆ All powder actuated tools shall be kept in a dry metal container and secured by lock and key.
- ◆ Never attempt to drive fasteners into very hard or brittle materials including cast iron, glazed tile, surface hardened steel, etc.
- ◆ Never drive fasteners into easily penetrated materials unless such materials are backed by a substance that prevents the pin or fastener from passing through creating a flying missile hazard on the other side.

- ◆ Do not use powder actuated tools in an explosive or hazardous atmosphere.
- ◆ Always use the correct shield, guard, or attachments recommended by the manufacturer.
- ◆ Keep observers at a safe distance from the work area.

Pneumatic and Hydraulic Tools

- ◆ Do not lock supply control valves open at any time.
- ◆ Never exceed safe operating pressures for hydraulic and pneumatic tools, hoses, valves, pipes, filters and fittings.
- ◆ Do not use hydraulic or pneumatic tools where they may contact exposed electrical conductors unless designed and maintained for such use.
- ◆ If pneumatic tools are used on energized electrical lines or equipment, provide protection against the accumulation of moisture in the air supply.
- ◆ Secure pneumatic power tools to the hose by some positive means to prevent the tool from becoming accidentally disconnected.
- ◆ Use safety clips or retainers on pneumatic impact tools to prevent them from being accidentally expelled.
- ◆ Release pressure before connections are broken, unless quick acting, self-closing connectors are used.
- ◆ Do not kink hoses.
- ◆ Do not use any part of your body to attempt to locate or stop a hydraulic or pneumatic leak.
- ◆ Do not hoist or lower tools by the hoses.

TRAFFIC CONTROL

TVA-TSP-18.815

- ◆ Traffic control plans must be in place for roadways where the movement of vehicles poses a hazard to workers conducting tasks on or near the roadway.
- ◆ Traffic control plans must ensure drivers, workers on foot and pedestrians can see and understand the routes they are to follow.
- ◆ Follow federal, state and local requirements when establishing traffic control.
- ◆ Use standard highway signs for information, speed limits and work zones that meet MUTCD requirements.
- ◆ Use standard traffic control devices such as cones, barrels and barricades to instruct drivers to the path to be followed.
- ◆ Flagging stations shall be located far enough in advance of the worksite to give approaching traffic sufficient distance to reduce speed.
- ◆ Flaggers shall wear high visibility clothing with a background of fluorescent orange-red or yellow-green with retro reflective material of orange, yellow, white, silver or yellow-green. This clothing shall make the worker visible for at least 1000 feet and be of Class 2 rating.
- ◆ Place signage so that drivers are warned that a flagger is ahead.
- ◆ Illuminate flagger stations at 5 foot candles or greater.
- ◆ Do not flag unless properly trained.

- ◆ The minimum PPE for all workers setting up traffic control is a hard hat, work boots, Class 2 Safety vest with retro-reflective striped and gloves.

VEHICLE SAFETY

TVA-TSP-18.610

- ◆ Remain alert and aware to avoid accidents.
- ◆ Use a vested flagger as a spotter when moving or positioning vehicles in congested areas or where contact with structures or other equipment, vehicles or pedestrians is likely.
- ◆ Do not operate motor vehicles without authorization and a valid state operator license or permit applicable to the type of vehicle being operated.
- ◆ Clear all windows of dirt, snow, ice, frost or any other obstruction before operation.
- ◆ Familiarize yourself with the location of critical vehicle controls such as light switches, wipers, hazard lights and turn signals before operating the vehicle.
- ◆ Use of a cell phone during vehicle operation in other than hands free mode is prohibited.
- ◆ Texting while operating a motor vehicle is strictly prohibited.
- ◆ Aggressive driving behaviors such as speeding, tailgating, weaving in traffic, making obscene gestures, failing to signal a lane change and yelling are strictly prohibited.
- ◆ Seatbelt use is required for the driver and each occupant of any TVA fleet, rented or privately owned motor vehicle being used for TVA business.

- ◆ Exit vehicles only after they have come to a complete stop.
- ◆ Do not allow loose items on floors, front seat, rear window or dash as these can become projectiles in a crash and injure occupants.
- ◆ Secure tools and other items with injury potential or install a protective screen between the cargo area and the vehicle occupants.
- ◆ Use caution when approaching and driving through areas where pedestrians frequent and at all pedestrian crossings. Be prepared to stop and then stop as required when pedestrians are in the crosswalks.
- ◆ Shut off the motor when refueling. Do not use electronic devices or smoke while refueling.
- ◆ When using a company owned vehicle, conduct a 360 degree Vehicle Walk Around prior to use by walking around the entire vehicle and making sure the back and sides of the vehicle is clear of obstacles.
- ◆ When parking a vehicle, choose the parking spot with the least potential for an accident. When possible, pull though the spot so no backing is required upon exit.
- ◆ Employees shall ride in or on only properly protected area of vehicles in motion - never on bumpers, tail gates, running boards, fork-lift forks, fenders or other hazardous locations.
- ◆ Do not smoke in a company owned vehicle.

TVA VALUES

Safety - We share a professional and personal commitment to protect the safety of our employees, our contractors, our customers, and those in the communities that we serve.

Service - We are privileged to be able to make life better for the people of the Valley by creating value for our customers, employees and other stakeholders, being good stewards of the resources that have been entrusted to us, and by being a good neighbor in the communities in which we operate.

Integrity - We conduct our business according to the highest ethical standards and seek to earn the trust of others through words and actions that are open, honest, and respectful.

Accountability - We take personal responsibility for our actions, our decisions, and the effectiveness of our results, which must be achieved in alignment with our company values.

Collaboration - We're committed to fostering teamwork, developing effective partnerships, and valuing diversity as we work together to achieve results.

TVA CORE COMPETENCIES

TVA's five Core Competencies define expectations and behaviors expected from all TVA employees and leaders and reinforce our values. Below are examples of how core competencies can be exhibited related to this handbook.

Accountability and Driving for Results

- Protecting the safety of yourself and co workers
- Exhibiting ownership of the work and safe work conditions by following rules, procedure use and adherence, good housekeeping, following work plans, etc.
- Good post job reviews to improve conditions and performance

Continuous Improvement

- Improve existing conditions
- Reporting good catches and safety suggestions
- Reporting problems with procedures and making suggestions to improve procedures
- Possess and display a questioning attitude

Leveraging Diversity

- Seek help from other crafts when problem solving
- Value perspective from all levels of experience
- Respect co-workers commitment to safety

Adaptability

- STOP When Unsure and Seek Help
- Adjust behaviors to support changes in the work environment

- Perform two minute rule and make changes necessary to ensure the safety of yourself and others
- Maintain quality and safety of work during changing conditions

Effective Communication

- Use three way communication as warranted to ensure messages are understood
- Listen to the input of others
- Provide honest answers to questions in a timely manner.

