COMBUSTION TURBINE POWER PLANTS

CONTRACTORS

SAFETY MANUAL

ASSOCIATED ELECTRIC COOPERATIVE INC.

INTRODUCTION

One of the major objectives of Associated Electric Cooperative, Inc. is to protect the health and safety of individuals involved in work on AECI property. To attain this goal AECI has established a comprehensive Safety and Loss Control program.

This manual is developed to coordinate job site safety between contractors, subcontractors, delivery personnel, and AECI employees. The efforts outlined in this program require the safety awareness and active cooperation of each person on the job. AECI asks for and expects the help of all contract personnel in making this a safe jobsite.

You should become familiar with the contents and use the manual as a guide to help you carry out your work. It is impossible to include safety procedures to meet all contingencies; therefore, in such instances not provided for, you will be expected to use your best judgment.

The best possible efforts have been made to assure compliance with current Federal, State, and Local Regulations. Where inconstancies are found current regulations will prevail.

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General Safety Rules

1. Contractor Requirements

   A. Contractors shall provide a work place free of hazardous, unsanitary or dangerous conditions for all employees.
   B. It shall be the responsibility of the contractor to initiate and maintain such accident prevention programs, hazardous material programs, and other programs as may be necessary to comply with Federal, State, and Local regulations while performing work on AECI property.
   C. It shall be the responsibility of the contractor to assure that all subcontractors and contractor employees abide by the safety rules and regulations established by AECI while on AECI property.
   D. Stay in only their assigned work areas.
   E. Contractor shall not bring any explosives, firearms, alcoholic beverages, or drugs on AECI property.
   F. Wear appropriate clothing at all times. Short pants and shirtless attire are prohibited. Sturdy shoes with steel shoes must be worn at all times. Safety glasses and hard-hats must be worn at all times.
   G. Failure of any contractor complying with these rules is a breach of contract and could result in contract termination. Specific contractor employees could also be banned from any job site for failure to abide by these rules.

First Aid and Medical Services

1. Contractor's are expected to provide standard first aid treatment and treatment for minor injuries for their own employees.
2. Should a serious injury occur, the contractor should call for medical aid by calling 911 from the Electrical Package or Maintenance Building.
3. Do not move the injured person unless absolutely necessary.
4. Do not treat serious injuries yourself.
5. If an injury or illness, that is severe enough to warrant the attention of a physician, and it is determined by the Contractor to be worked related, the Contractor should supply a copy of an Employee injury report to the AECI Site Manager.

Medical Emergency Direct Phone Numbers

Holden

Holden City Hall Business Office	816-850-6400

Essex

Missouri Delta Medical Center	573-471-1600

Nodaway

Ambulance	660-582-8188

Asbestos

No material containing asbestos is known to exist at the Combustion Turbine Power Plants.

Personal Protective Equipment (PPE)

1. General

   PPE includes clothing and other accessories designed to create a barrier between the user and workplace hazards. It should be used in conjunction with engineering work practices and/or administrative controls to provide maximum employee safety and health in the workplace. All contractors are responsible for providing training and insuring the proper use of required personal protective equipment.

2. Hard Hats

   AECI requires that all contract employees, subcontractors, visitors, and delivery personnel wear hard hats on AECI property

3. Hearing Protection

   AECI requires that all contract employees, subcontractors, visitors, and delivery personnel wear appropriate hearing protection to reduce time weighted average exposure levels on noise within OSHA permissible exposure limits.

4. Eye and Face Protection

   AECI requires that all contract employees, subcontractors, visitors, and delivery personnel wear as a minimum; safety eyeglasses. More specialized eye protection should be required by the contractor as work being performed demands. All eye wear shall meet ANSI Z87.1-1968 standards.

5. Respiratory protection

   Respiratory protection that conforms to OSHA regulations shall be used when engineering controls are not adequate to protect employee from exposure to air contaminants. No Contact employee may be assigned to wear a negative pressure respirator unless they have first been evaluated by a physician to determine their physical ability to wear the respirator.

6. Foot Protection

   Steel toe safety shoes are recommended for all workers. Sneakers, sandals or canvas shoes are not permitted.

Safety Harnesses and Safety Nets

1. Safety Harnesses

   Safety harnesses, lifeline, and lanyards shall be used only for employee safe guarding. Lifelines shall be secured above the point of operation to an anchorage or structural member capable of supporting a minimum dead weight of 5,400 pounds. A lanyard shall be a minimum of ½ inch nylon rope or equivalent with a maximum length to provide for a fall of no greater than 6 feet, or to keep the employee from contacting the next lower level.

2. Safety Harnesses shall be worn when:

   Working on any structure, member, or device that is of a height greater than 6 feet above the next lower level, except when working on an *approved* scaffold.

3. Safety Nets

   Safety Nets shall be provided when work places are more than 25 feet above the ground, water surface, or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines or safety harnesses is impractical.

Fire Protection and Prevention

1. Fire Protection

AECI provides, inspects, and maintains, sufficient fire protection systems and equipment to protect exposures in the permanent plant facilities. AECI employees are trained in the operation and use of these systems and equipment. Contractors in the permanent plant facility are responsible for the following:

A. Report all fires to the AECI Site Manager, no matter how small.
B. Provide the AECI Site Manger with locations and type of all combustible or flammable materials brought on to AECI property.
C. Contract personnel will evacuate immediately to an area designated by AECI plant personnel. Contract supervision is responsible for a roll call of all personnel and should report all present, or any missing personnel with last known location to the AECI Site Manger.

2. New construction or remote location (away from the plant structures area)

Contractors in addition to complying with 1.A thru C shall provide fire protection equipment of the proper type and quantity to protect the construction site, equipment, and materials.

3. Fire Prevention

A. All contract personnel shall practice good housekeeping and will not let combustible scrap or refuse accumulate in the areas they are responsible for.
B. Obey all posted no smoking areas and do not smoke in areas where combustible or flammable material is in use.
C. Store oily, paint soaked, or solvent soaked rags in covered metal containers.
D. Cut or weld only when permitted to do so. Welding or cutting should not take place near locations where flammables are present. An approved fire extinguisher should be located at each welding or cutting area. Refer to the Welding and Cutting section for more details.
E. Store combustible or flammable liquids in proper containers, and use proper bonding and or grounding when transferring fuels.
F. Report all fire hazards to the AECI Site Manager.
G. Open fires of any kind are not permitted.
H. Gas Cylinders should be transported and stored in an upright position. When stored, keep them at least 25 feet from oxygen cylinders.
I. No material should be stored within 3 feet of an electrical panel, outlet or fire suppression system.
J. Smoking is prohibited within 100 feet of any plant enclosure or gas piping and in the Maintenance Building and Substation Control Building.

Housekeeping

1. Keep aisles clear for safe passage of people and material.
2. Clean up slippery substances, such as grease or oil spilled on floors or other work surfaces. Cover with sand or other non-slip material.
3. Keep tools in boxes, racks, or trays when not in use.
4. Nails, pieces of wood with protruding nails, and other sharp objects should not be left on floors and walkways. Store them where they cannot be stepped on.
5. Keep exits clear. Keep fire extinguishers readily accessible and free of obstruction.
6. Do not let materials such as scrap lumber, metal, and debris accumulate which might cause a tripping hazard.
7. Dispose of empty bottles, cans, paper, and other containers by depositing them into the receptacles provided.
8. The job site should be cleaned daily and debris must be disposed of onsite, or offsite, in accordance with all EPA regulations.
9. Failure to maintain adequate housekeeping and clean-up will result in contractual action taken by AECI.

Material Handling

1. Use proper lifting techniques when handling materials. Lift heavy objects as instructed, with leg muscles and not with the back.
2. Stored materials must not block exits, aisles, fire protection equipment, or passageways.
3. Material stored inside buildings or structures under construction must not be placed within 6 ft. of any hoist way or other inside floor opening or within 10 ft. of an interior wall which does not extend above the top of the material stored.
4. Pipe, conduit, and bar stock should be stored on racks or stacked and blocked to prevent movement.
5. The quantity of materials stored on scaffolds, platforms, or walkways must not exceed what's required for 1 day's operation.
6. Materials must never be thrown or dropped from a distance of more than 20 ft. The drop area must be barricaded to protect personnel from being struck by falling materials. Trash chutes are required for dropping materials from heights above 20 ft.
7. Protruding nails must be bent or pulled when stripping forms or uncrating material.
8. All ropes, chains, cables, slings, etc., and other hoist equipment must be inspected each time before use.

9. A load should never be lifted and left unattended.
10. Wear safety gloves when handling materials.
11. Properly stack and secure all materials prior to lifting or moving to prevent sliding, falling, or collapse.

Rigging

1. Rigging equipment shall be inspected prior to use on each shift. Defective rigging shall be removed from service.
2. Rigging equipment shall not be loaded in excess of recommended working load limits.
3. Wire rope shall be removed from service if there is a marked reduction in rope diameter, excessive broken wires, kink damage, or other mechanical damage.
4. Never strain wire rope over sharp corners.
5. Remember that increasing the angle between the legs of a sling, increases the load on each leg.
6. Do not paint hooks.
7. Only qualified personnel may be assigned to rigging operations.
8. Rigging equipment is not permitted to work closer than 10 feet to any power line.
9. All rigging devices should have permanently affixed identification stating size, grade, rated capacity, and manufacturer.
10. "Shop-made" grabs, hooks, clamps or other lifting devices are prohibited.

Hand Tools and Power Tools

1. All hand and power tools and similar equipment, whether issued by the employer or furnished by the employee, shall be maintained in safe condition and properly stored.
2. Wrenches shall not be used when jaws are sprung to the point that slippage occurs.
3. Impact tools, such as drift pins, wedges, chisels, etc. shall be kept free of mushroomed heads.
4. Wooden handles shall be free of splinters, cracks, and be tight in the tool.
5. Electric power operated tools shall either be of the approved double insulated type or grounded in accordance with OSHA requirements.
6. Any power-operated tools designed with guards shall have the guard in place when in use.
7. The use of electric cords for hoisting or lowering tools is not permitted.
8. Only trained employees are allowed to operate powder actuated tools.
9. All powder-actuated tools shall be tested daily, and all defects are corrected before use.
10. All powder-actuated tools should be of the low velocity, cushioned pistol grip, piston type design.
11. Powder-actuated tools should not be used in areas where hazardous, ignitable dust gases, or liquids are present.
12. All maintenance work on powder-actuated tools must be performed according to manufacturer specifications and must be done be qualified persons only.
13. All defective tools and equipment must be reported immediately to your Supervisor and tagged "out of service". Temporary and makeshift repairs are prohibited.
14. Floor stand and bench mounted grinders shall be provided with properly adjusted work rests and grinding wheel guards.
15. Abrasive wheels and tools shall comply with ANSI B7.1-1970, safety code for use, care, and protection of abrasive wheels.
16. All employees using abrasive wheels shall be protected by eye protection equipment appropriate to the equipment and task being performed.
17. Gas powered tools should not be used in unventilated areas and gas should be dispensed from U.L. approved cans only. All gas-powered tools must be turned off before being refueled.

Welding and Cutting and Other "Hot" Work

No "Hot" work is permitted at AECI Combustion Turbine Plants in the presence of flammable or combustible materials. AECI uses the Factory Mutual "Hot Work" permitting system for all heat or spark producing operations except in those areas designate by AECI as safe areas. Hot Work permits are issued by the AECI Site Manager.

The Factory Mutual "Hot Work" permit system and cutting and welding safety is outlined below.

1. Hot work permits are required for any temporary operation involving open flames, or producing heat and/or sparks. This includes, but is not limited to: Brazing, cutting, grinding, soldering, thawing pipe, torch applied roofing, and welding.

    A. Required precautions checklist.

        1. Available sprinklers, hose streams, and extinguishers are in service and operable.
        2. Hot work equipment is in good repair

    B. Requirements within 35 ft. (10m) of work.

        1. Flammable liquids, dust, lint, and oily deposits removed.
        2. Explosive atmosphere in area eliminated.
        3. Floors are swept clean.
        4. Combustible floors are wet down, covered with wet sand or fire resistive sheets.
        5. Remove other combustibles where possible, otherwise protect with fire resistive tarpaulins or metal shields.
        6. All wall and floor openings covered.

    C. Work on ceilings

        1. Construction of wall or ceiling is noncombustible and without combustible covering or insulation.
        2. Combustible material on other side of wall is moved away.

D. Work on enclosed equipment

1. Enclosed equipment cleaned of all combustibles.
2. Containers purged of Flammable liquid/vapors

E. Fire Watch/Hot Work area monitoring

1. Fire watch will be provided during and for 60 minutes after work, including any coffee or lunch breaks.
2. Fire watch is supplied with suitable extinguishers or charged small hose.
3. Fire watch is trained in the use of this equipment and in sounding alarm.
4. Fire watch may be required for adjoining areas, above, and below.
5. The AECI Site Manager will see that the hot work area is monitored for 4 hours after the job is completed to assure that no fires have started.

Gas welding and Cutting Safety

1. Valve protection caps shall be in place when moving, transporting, and storing compressed gas cylinders.
2. Cylinders shall be secured on a cylinder truck by chain or other steadying device while in use.
3. Cylinders containing oxygen, acetylene, or other fuel gas shall not be taken into confined spaces.
4. No defective or damaged cylinders shall be used.
5. Fuel gas hose and oxygen hose shall be easily distinguishable from each other, without defects, and fitted with rotary motion disconnect fittings.
6. Torches shall be inspected at the beginning of each work shift. Defective torches shall not be used.
7. All torches shall be fitted with approved flashback control devices.
8. Torches shall only be lighted by friction lighters or other approved devices, and not by matches or from hot work.
9. Employees are required to wear the proper personal protective equipment such as coveralls, safety goggles, face shield, welding hood, welding jacket, etc., as demanded by the type of work completed.

Arc Welding and Cutting

1. Any faulty or defective machines, cables, or electrode holders must be removed from service and reported to the supervisor.
2. Welding cables and connectors:
    A. All welding, cutting cables, and connectors shall be on a completely insulated and flexible type capable of handling the maximum current requirements of the work in progress.
    B. Only cable free from repair or splices for a minimum of 10 ft. from the end to which the electrode is connected shall be used, except that insulated connectors or splices whose insulating quality is equal to that of the cable are permitted.
3. Employees are required to wear the proper personal protective equipment such as coveralls, safety goggles, face shield, welding hood, welding jacket, etc., as demanded by the type of work completed.

Electrical Safety

1. General Requirements
    A. All construction electrical installations and temporary wiring shall be made in accordance with the National Electric Code ANSI/NFPA latest edition and all Federal, State and local codes.
2. Temporary lights will be equipped with guards. Broken burned out bulbs should be replaced.
3. Temporary electric cords must be covered or elevated. They must be kept clear of walkways where they may be exposed to damage or create tripping hazards.
4. Extension cords used with portable electric tools and appliances must be heavy duty (no less than 12 gauge conductors) of the three wire grounding type, and must conform to OSHA standards. NO FLAT ELECTRICAL CORDS ARE ALLOWED ON SITE.
5. Voltages must be clearly labeled on all electrical equipment and circuits. Circuits must also be clearly marked for the areas of service they provide.
6. Prior to performing any work, electricians must "lockout and tagout" the equipment or machinery. The only exception is when power is required for "megging" circuits.
7. All temporary electrical circuits shall be periodically inspected and properly maintained.
8. Safety Related Work Practices
    A. No employer shall permit an employee to work in such proximity to any part of an electrical power circuit that the employee could contact the electrical power circuit in the course of work unless the employee is protected against electrical shock by de-energizing the circuit and grounding or guarding it effectively by insulation or other means.
    B. In work areas where the exact location of underground electrical cables is unknown, employee using jackhammers, bars, or other hand tools, which may contact a line, shall be provided with insulated protective gloves. All insulated protective gloves must be tested prior to use, in accordance with the National Electric Code.
    C. Before work is begun the employer shall ascertain by inquiry, direct observation, or instruments, whether any part of an energized electrical power circuit, exposed or concealed is located so that the performance of the work may bring any person, tool, or machine into physical contact with the circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such line, the hazards involved, and the protective measures to be taken.

Note: AECI is subject to the Power Generation and Transmission OSHA standard 29 CFR 1910.269. Contractors working on AECI premises may also be subject to portions of this regulation.

Lockout and Tagging of Circuits

1. Controls that are to be deactivated during the course of work on equipment or circuits, shall be tagged/locked in accordance with AECI tagging procedure.
2. Equipment or circuits de-energized shall be rendered inoperative and shall have tags and/or locks attached at all points where such equipment or circuits can be energized.
3. AECI Tagging/Lockout Protection Procedure

   The primary purpose of this procedure is to provide protection to employees working on mechanical and/or electrical equipment. It is a method to remove or withhold equipment form service thereby:

   A. Preventing switches, valves, or other devices from being operated which could cause injury to employees working on de-energized equipment.
   B. Identify the boundary of the cleared zone.
   C. Preventing damage to equipment.
   D. Preventing all persons whom are not signed on from entering the protected area.

Power Plant Tagging Procedures

A. Responsibilities - Definitions

1. The Supervisory Authority is designated by the AECI Site Manager to be responsible for plant tagging/lockout protection.
2. The Operating Authority is a supervisor authorized by the Supervisory Authority to issue, place and remove tags/locks. The Operating Authority may assign qualified personnel to place or remove tags/locks.

B. Description on Tags and Forms

1. A Safety Tagging Request is the approved form that contains the work description, tagging directives, and lines for authorized persons to sign on and off tagging protection.
2. Danger Tags (White with Red Stripes) are issued to permit work on electrical and/or mechanical equipment that has been de-energized, or by means of the operation being blocked.
3. Only approved tags with a non-reusable self-locking attachment device shall be used.

C. Tagging Requests and Placement

1. All prime contractors shall furnish Associated Electric's designated "Operating Authority" with the name of their "Responsible Contractor Authority" who will request, verify, and release all clearance tags applied for his work areas.
2. The designated "Responsible Contractor Authority" shall provide Associated Electric's "Operating Authority" with the names of those individuals who shall be allowed to sign on to Clearance Tags. These "Authorized Persons" shall not be allowed to request clearance tags, but will be allowed to sign on to a clearance tag and sign off of the clearance tag. These individuals shall also at their discretion verify the tagging prior to any work in the area covered by the clearance tag being started.
3. No one other than the "Operating Authority", the "Responsible Contractor Authority", and the "Authorized Persons"" will be allowed to sign onto a clearance tag.
4. The "Operating Authority" provides the 'Clearance Tagging Request' forms and the required tags and padlocks.
5. The Responsible Contractor Authority shall sign and date the 'Safety Tagging Request' form to verify it's accuracy.
6. Any "Authorized Persons" shall then sign onto the Safety Tagging Request form.
7. The "Operating Authority" or designated person will hang the tags and sign and date the "Clearance Tag Hung By" space on the "Safety Tagging Request" form.
8. The "Responsible Contractor Authority" shall verify that the tag(s) associated with the request are in place and shall sign and date the "Safety Tagging Request" form is the designated space.
9. The 'Operating Authority' will install padlocks at the locations requested by the 'Responsible Contractor Authority'. Only padlocks owned and installed by the "Operating Authority" will be allowed.

All padlocks other than those installed by the "Operating Authority" will be forcibly removed.

10. After all tags are verified, -work may begin.

D. Removing Tagging Protection

1. When work in a protected zone is completed, each authorized person who is signed on to the tag must sign off of the tag in the "Released By" space provided on the "Safety Tagging Request" form. He cannot re-enter the protected work area for any reason, unless he again signs on a new entry line.
2. Before Tagging protection is removed:

    (1) The "Operating Authority" shall check that all authorized persons who signed on the "Safety Tagging Request" have signed off, and

    (2) The "Operating Authority" (or designate) shall inspect the work area to ensure that all persons have been safely positioned or removed, that non-essential items have been removed, and that machine or equipment components are operationally intact.
3. If an authorized person is not available to sign off his name, the "Supervisory Authority" must direct the release of the tagging protection in accordance with OSHA standards. In the absence of the "Supervisory Authority", the "Operating Authority" shall have this responsibility.
4. Tags will be removed by the operating authority (or designate)
5. All tags will be returned to the Operating Authority. He shall check each tag against the Clearance Tag Listing, and then destroy all used tags. Tags shall not be reused. Tagging Protection forms will be kept at the site for six months and then will be scanned into the Cooperatives permanent filing system in Springfield, Missouri.

E. New Facility Construction

1. The contractor may use any form of lock-out/tagging that complies with OSHA standards for new facility construction that is outside of and not connected to permanent facilities until such equipment or facilities are accepted by AECI.
2. Warranty work or modifications performed after acceptance will be performed under AECI tagging protection.
3. Final connections whether mechanical or electrical will be made under AECI tagging protection procedures.

Scaffolding

1. All scaffolds shall be erected in accordance with appropriate OSHA standards for the type and application used.
2. The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement.
3. Guardrails, mid rails, and toe boards must be installed on all open sides of scaffolds 10 feet or more in height. Guardrails must be 2x4 inches or equivalent, supported at intervals of not more than 8 feet. Toe boards shall be a minimum of 4 inches in height.
4. Where persons are required to work, or pass under, the scaffolds shall be provided with a screen between the toe board and rail, extending along the entire opening, consisting of # 18 gauge U.S. standard wire ½ inch mesh or equivalent.
5. Overhead protection shall be provided if employee working on scaffolds are exposed to overhead hazards.
6. Scaffold and their components shall be capable of supporting without fail at least 4 time the maximum load intended.
7. Any scaffolding including all accessories, damaged or weakened from any cause shall be immediately repaired or replaced.
8. All planking shall be scaffold grade as recognized by approved grading rules for the species of wood used, and of full 2x10 thickness.
9. An access ladder or equivalent safe access shall be provided.
10. Scaffold planks shall extend at least 6 inches but no more than 12 inches over the end of the support.
11. All scaffolds must be two planks wide; no employee may work from a single plank.
12. Scaffold planks must be visually inspected before use. Damaged planks must be removed from service.
13. Scaffold must be tied to the building or structure at intervals, which do not exceed 30 feet horizontally, and 26 feet vertically.
14. Lean to scaffolds and makeshift platforms are prohibited.
15. All scaffolds over ten feet high are required to have load footprints and limits that can be obtained from the scaffold manufacturer.
16. When erecting and dismantling scaffolds, OSHA's Project Six-Foot Fall Protection Requirements must be followed.
17. Ladders must be used to climb scaffolds at all times. Workers should never climb a scaffold's cross bracing. Both hands should be free of tools/materials when ascending or descending a scaffold. Employees should not propel themselves while working on scaffolds.

Floor and Wall Openings

1. Floor openings shall be guarded by a standard rail and toe board or cover. In general the railing shall be provided on all exposed sides, except at entrances to stairways.
2. Wall openings from which there is a drop of more than 4 feet and the bottom of the opening is less than 3 feet above the working surface will have a standard guardrail.
3. Open sidled floor or platforms 6 feet or more above the adjacent floors or ground level and runways 4 feet or more above the ground floor level shall be provided with standard handrails and toe boards.
4. Stairways having four or more risers shall be equipped with standard stair railing on both sides.
5. Guardings and/or covers are not to be removed until other means of fall protection are in place. Employees installing or removing guarding or covers should be protected by alternative fall protection.
6. Employees are prohibited in any area that could expose them to a fall unless proper fall protection procedures are in place.
7. Stairways should be free of hazardous projections, debris, and other loose materials.

Cranes, Hoist, Elevators & Conveyors

1. Cranes

   A. All cranes must be operated and maintained in accordance with established standards, specifications, and limitations.
   B. Only trained, qualified employees are permitted to operate any crane or rigging equipment. Training includes an in-depth review of the operating characteristics and limitations of the equipment.
   C. A fire extinguisher is to be kept in the crane's cab at all times.
   D. "Shop-made" grabs, hooks, clamps, or other lifting devices are prohibited.
   E. A licensed engineer must inspect all lifting beams and spreader bars to make sure that they are the proper size for the capacity.
   F. Slings should not be shortened by using knots, bolts, or other make shift designs.
   G. Wire rope slings should be padded to protect against damage from sharp corners.
   H. Hard hats and proper personal protective equipment should be worn while operating or working close to a crane.
   I. Rated load capacities and recommended operating speeds, special hazard warnings, or instruments shall be conspicuously posted.
   J. Cranes shall be inspected prior to use each shift. Records of inspections shall be kept as required by law.
   K. Hand signals to crane operators shall be by ANSI standards for the type of crane in use.
   L. Accessible areas within the swing radius must be barricaded.
   M. Do not ride hook or load.
   N. Safety latches are required on all crane hooks.
   O. Do not operate crane or bring its loads within 10 feet of electrical distribution lines.
   P. The use of a crane to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling or conventional means of reaching the work site would be more hazardous or is not possible because of structural design or work site conditions. The following precautions are required when using cranes to hoist personnel:

      1. Hoisting of the personnel platform shall be performed in a slow, controlled manner with no sudden movements of the crane platform.
      2. Load lines shall be capable of supporting without failure at least ten times the maximum intended load.

3. A trial lift with the unoccupied personnel platform loaded at least to the anticipated lift weight of personnel and material, shall be made from the ground level with full crane operational tests. The trial lift shall be repeated prior to hoisting personnel any time the crane is moved and set up in a new location or returned to a previously used location. In every case the trial lift must be conducted at the beginning of every shift.

4. Work Practices
    A. Employees shall keep all body parts inside the platform during raising, lowering, or positioning.
    B. Employees being hoisted shall remain in continuous sight of and direct communication with the crane operator.
    C. Employees occupying the personnel platform shall use a body belt/harness system with the lanyard attached to the lower load block, overhaul ball, or structural member within the platform.
    D. Hoisting of employees while the crane is traveling is prohibited.

Motor Vehicles and Equipment

Contractors may not drive privately owned vehicles on AECI property unless the vehicles are covered by the contractor's liability insurance. Proof of coverage must be provided to the AECI Site Manager prior to vehicle entry to AECI property.

1. The parking brake must be set whenever the vehicle is parked. Equipment parked on an incline must have the wheel chocked.
2. Seat belts must be provided and used on all vehicles and equipment on AECI property.
3. Do not ride on the bed of trucks containing materials which are not properly secured to prevent movement.
4. All personnel are prohibited from riding on loads, fenders, running boards, tailgate or with arms or legs dangling over the side.
5. Drivers must not move vehicles until riders comply with all safety rules.
6. Do not back up vehicles when the view to the rear is obstructed unless:

    A. It is equipped with an audible back up alarm which is audible above the surrounding noise for a distance of 200 feet.
    B. An observer signals it is safe to do so.

7. Obey posted speed limits.
8. Only authorized, licensed drivers are permitted to operate vehicles or equipment. Accidents must be reported to the AECI Site Manager immediately.
9. Engines must be shut off during all maintenance and fueling operations.
10. Employees are required to obey all state law, local, and company laws, rules and regulations while operating vehicles or equipment.
11. Any vehicle or piece of equipment with material extending four feet or more from the rear of the vehicle must have a red flag or cloth 12 inches square attached to the material.

Excavations and Trenching

1. All excavations and trenching operations must conform to established regulations and standards.
2. Sides of excavations in unstable or soft material or more than 5 feet in depth shall be shored, sloped, or otherwise supported.
3. When employees are required to work in trenches 4 feet or more deep, an adequate means of egress shall be provided so as to require no more than 25 feet of lateral travel for employees.
4. Never pile soil or material closer than 2 feet from the edge of excavations.
5. Walkways with standard guardrails must be provided where employees are required to cross over excavations or trenches.
6. Daily inspections of excavations shall be made by a competent person for evidence of a situation that could result in cave-ins, indications of protective systems, failures, hazardous atmospheres, or other hazardous conditions. Inspections shall also be conducted after every rainstorm or other hazard increasing occurrence. These inspections are only required when employee exposure can be reasonably expected.
7. Shoring systems should be installed from the top down. Crossbeams should be placed in a horizontal position and spaced vertically at appropriate intervals. Braces must also be secured to prevent sliding, falling, or kickouts.
8. One of the following methods of support should be used to ensure worker safety: shoring-sheeting; tightly placed timber shores; bracing; trench jacks; piles; or other materials installed in a manner strong enough to resist the pressures surrounding the excavation.
9. OSHA standards require that diversion dikes or ditches be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. Water should not accumulate in a trench or excavation as it causes erosion and soil softening.
10. Excavations greater than four feet deep should be inspected daily for oxygen deficiencies and hazardous gases, etc. If hazardous conditions exist, proper respiratory protection or ventilation should be provided by the Contractor.
11. Locations of all underground utilities should be located before excavation begins.

Ladders

1. All ladders shall be inspected for defects prior to use. Any defective ladder should be removed form service and reported to your supervisor for repair or replacement.
2. Portable ladders shall be placed on a substantial base at a 4 to 1 pitch, have clear access at top and bottom, and extend at least 36 inches above the landing and be secured against movement when in use.
3. Always face the ladder and use both hands when climbing up or down. If you have to raise or lower tools, use a line.
4. Do not use metal ladders for electrical work or where they may contact electrical conductors.
5. Do not use stepladders as strait ladders.
6. Avoid over reaching when working from ladders.
7. Manufactured ladders must comply with OSHA, ANSI, manufacturer and job specifications.
8. The six-foot fall protection procedure applies when working from a ladder. All ladders should be secured with a rope or other substantial device.
9. Ladders should be maintained free of lines, ropes, hoses, wires, cables, oil, grease, and debris. No objects should be left on ladders.
10. Never stand or sit on the top rung of a stepladder.
11. Never climb or work from the back of a ladder.
12. Never work with another person on the same ladder.
13. The contractor should provide training programs on ladders for all employees.

Compressed Gas Cylinders

1. The protective caps of gas cylinders must be kept on all cylinders when not in use.
2. All cylinders must be properly secured to prevent tipping.
3. All gas cylinders whether in use or in storage must be secured in an upright position by some substantial means such as chains or ropes.
4. Oxygen and Fuel gas cylinders in storage, must be separated from each other by a separation of 20 feet or by a 5-foot high barrier wall which has a minimum 1-hour fire rating.
5. Compressed Gas cylinders shall not be taken into confined spaces.

Permit Required Confined Spaces

1. Only contract employees who have been trained in compliance with OSHA confined space standard 29 CFR 1910.146 may enter permit required confined spaces.
2. Only trained attendants shall be used to monitor permit required confined spaces while authorized entrants are inside.
3. No person should enter a confined space until all preparations for entry have been completed, the permit has been approved, all conditions of this Entry Procedure have been met, and the entry is authorized.
4. No person should enter a confined space unless an attendant is on duty. The attendant must maintain visual and/or voice contact at all times with personnel in the confined space.
5. Personnel using monitoring equipment should be trained in its use and calibration.
6. All electrical shock hazards should be protected by use of low voltage systems and/or ground fault protector.
7. Explosion-proof electrical equipment is required for entry into spaces where potential fire and/or explosion exists.
8. If conditions in the confined space change, personnel should be removed, the changes investigated, lock-outs re-verified, and the area re-monitored.
9. If confined space work continues past the initial shift, the Contractor should sign the permit, re-verify the lock-outs, re-monitor the atmosphere and record the data on the permit, verify that all other requirements of this procedure have been met, and inherit all of the responsibilities associated with the entry. This process should be repeated at the beginning of each subsequent shift.
10. When the job has been completed, the competent person should verify that all personnel and equipment have been removed from the confined space by signing the permit. This completed permit should then be retained by the Contractor for the duration of the job.
11. No one should enter confined spaces without a permit. Violations are grounds for dismissal. The AECI Site Manager should identify all confined spaces by sign, placard or other appropriate means. He should also identify the "permitter". Only authorized permitter's can issue a permit. The permitter should personally inspect, examine and evaluate the confined space before entry and should assure that all hazards have been identified before allowing entry.
12. The permitter should discuss the following with all personnel:
    1. Emergency procedures.
    2. What the emergency - standby person must do.
    3. All permits are null and void in case of an emergency.
    4. How to request a re-check of the permit.
    5. What the permit does and does not authorize.

. 6. The duration of the permit - one shift (or the duration of the entry, whichever is shorter).

7. Permit postings. The perimeter should post the permit as follows:
   1) The original - at the point of entry.
   2) The second copy - Contractor's office.
   3) The third copy - in the AECI Site Managers office.

8. The following work rules are unconditionally and automatically the requirements for confined space entry procedures:

A. Ventilation should be of adequate volume to safely maintain the airflow within the confined space

B. It is the responsibility of the Contractor to immediately report unsafe conditions.

C. A flashlight should be carried by each person entering a confined space.

D. Lighting used must be explosion proof, 12-volt system or flashlight.

E. Welding, cutting, brazing, and purging operations require specific requirements - consult with the permitter.

F. Chemicals used or transported inside the confined space require specific requirements - consult with the permitter.

Should confined space rescue or emergency services be needed, they may be obtained by contacting the AECI Site Manager.

The following locations and structures have been designated by AECI as permit required confined spaces at the Combustion Turbine Power Plants:

a. Exhaust bearing tunnel
b. Inlet air duct between the evaporative cooler and inlet silencers
c. Inlet air duct between the inlet silencers and compressor
d. Electrical vault
e. Stack
f. EHC skid reservoir
g. Gas filter separator vessel
h. Lube oil reservoir
i. Turbine building ventilation fan and exhaust hood enclosures
j. Evaporative cooler water supply valve pit