



Tennessee Valley Authority

NUCLEAR POWER STANDARD

STD-6.6
Rev. 0
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Title

SAFE PRACTICES FOR OPERATION OF OVERHEAD HANDLING EQUIPMENT

Quality Related

Nonquality Related

Effective Date:

This Standard supersedes interim Standard - STD-10.3.179.

NOTE :

T&CS will perform crane-related activities on TVA nuclear sites in accordance with an Intergroup Agreement (W01 890815 869).

Bellefonte Nuclear Plant (BLN) will implement a limited overhead handling program in accordance with W01 900619 881 while in layup status.

Written by: Edward N. McCoy Signature Reviewed by: David L. Haffley Signature 2/28/91 Date

CONCURRENCES

Concurrence Signature	Date	Concurrence Signature	Date
<input type="checkbox"/> Nuclear Business Operations		<input checked="" type="checkbox"/> Nuclear Quality Assurance <u>RC Parker for LEM</u>	<u>4-2-91</u>
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<input type="checkbox"/>		<input type="checkbox"/> New Generation and BLN	
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APPROVAL

Approved by: RC Buckle for ARB Signature NO Organization 4/2/91 Date

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REVISION LOG

Revision Number	Approval Date	Pages Affected	Description of Revision
0	04/02/91	All	Initial issue. This Standard supersedes interim STD-10.3.179.

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1.0 PURPOSE

This Standard establishes requirements for the control of overhead handling activities at TVA's nuclear sites in accordance with existing nuclear and industrial safety regulatory requirements. This Standard is to be used in conjunction with the Nuclear Maintenance Good Practice MGP-M-175 entitled Nuclear Power Crane, Hoist, and Rigging Manual which provides information and criteria necessary to establish and maintain an effective overhead handling program. This manual will be controlled by Nuclear Maintenance.

2.0 SCOPE

This Standard applies to all TVA employees and contractors involved with overhead handling activities at a TVA nuclear site unless specifically negotiated separately under an intergroup agreement.

This Standard establishes requirements for certification or qualification of craft management and personnel directly involved with overhead handling. These requirements apply to the inspection, testing, maintenance, and operation of overhead handling equipment, including overhead and gantry cranes, mobile cranes, monorail systems, overhead hoists, base-mounted drum hoists, slings and special lifting devices. These requirements do not apply to nuclear fuel handling equipment, e.g., fuel transfer system, spent fuel pit bridge crane, manipulator crane, refueling platform, etc.

3.0 INSTRUCTIONS**3.1 General Requirements**

3.1.1 Personnel directly involved with overhead handling activities at Nuclear Power sites must be qualified and/or certified as required by the following:

A. Qualification requirements - position qualification by training and/or examination shall be required for the following job functions and obtained in accordance with MGP-M-175.

1. Crane coordinators.
2. Crane inspectors (monthly).
3. Instructors.
4. Lead crane maintenance personnel.
5. Pendant crane operators.
6. Rigging personnel.

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7. Signal personnel.

8. Supervisors (as a minimum, Craft Foreman).

B. Certification requirements - position certification by training and/or examination, including a skills test, shall be required for the following job functions and obtained in accordance with MGP-M-175.

1. Overhead Cranes:

a. Annual inspectors (including inspectors outside NP).

b. Certifiers.

c. Crane operators (including cab/pendant and radio-controlled cranes).

2. Mobile Cranes:

a. Annual inspectors (including inspectors outside NP).

b. Certifiers.

c. Crane operators.

C. Medical requirements - annual inspectors, cab-operated overhead crane operators, and mobile crane operators shall pass a medical examination for crane operators as given by Medical Services.

D. Recertification:

1. Personnel certified to inspect or operate overhead cranes must be recertified in accordance with MGP-M-175 every 5 years.

2. Personnel certified to inspect or operate mobile cranes must be recertified in accordance with MGP-M-175 every 3 years.

E. Certification shall be revoked, depending on severity of the incident, for any of the following reasons:

1. Causing an accident due to operator or inspector error.

2. Operating under the influence of drugs or alcohol.

3. Falsifying certification records.

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3.0 INSTRUCTIONS (Continued)

4. Inability to pass the medical examination.
 5. Violating safety rules involving operation of the crane.
- F. Certification shall be suspended for any of the following reasons:
1. When the operator's medical examination becomes delinquent (three years from date of examination for crane operators) or if there is a medical change that prevents the operator from meeting the physical or psychological requirements.
 2. When the operator has been involved in an accident for which an Accident Investigation Team (AIT) has been convened.
 3. When the operator has been involved in a near miss or serious incident, suspend certification for a specified length of time based on the findings of the incident.
- 3.1.2 All overhead lifts at nuclear sites shall be performed in accordance with the following applicable lift categories:
- A. Heavy Load Lifts (NUREG-0612) - these lifts are performed per the requirements of Subsection 3.6 of this Standard in accordance with NRC commitments at each site.
 - B. High Hazard Lifts - these lifts are defined in Section 5.0 and are performed in accordance with Appendix A, including formal documentation per the High Hazard Lift Permit.
 - C. Normal Lifts - these lifts constitute all lifts excluding Heavy Load and High Hazard Lifts and are performed routinely using qualified/certified personnel for operation, rigging, and flagging.
- 3.1.3 Interfaces with Nuclear Engineering and Nuclear Maintenance (NM) are required when dealing with non-routine problems associated with overhead handling equipment operations, maintenance, modification, and procurement.
- A. Nuclear Engineering at each site should review or confirm vendor performed review/recommendations in the areas of:

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1. Modifications.
2. Procurement of overhead handling equipment.
3. NUREG-0612 requirements.
4. Equipment failure/design deficiencies reported in TVA and industry-wide operating experiences.
5. Major rebuild.
6. Special tests of cranes, hoists, and lifting devices.
7. Special overrated load lifts of overhead cranes.

B. Interfaces with NM are to be established to:

1. Develop/maintain inspection, testing, maintenance, and operations programs or procedures.
2. Resolve unusual or significant inspection deficiencies that may be applicable at other sites.
3. Resolve overhead handling requirements that cannot be resolved at the plant level.
4. Perform evaluations of operational and maintenance data in determining trends.
5. Perform generic operating experience reviews relative to operations and/or maintenance activities.
6. Represent NP on generic regulatory concerns relative to operations and maintenance.

3.1.4 Accidents and near-miss incidents involving overhead handling equipment are to be reported immediately to the site Industrial Safety Staff for appropriate investigation.

A. Accidents meeting the serious accident definitions outlined in TVA's "Serious Accident Investigation Procedure" are to be investigated by a TVA appointed Accident Investigation Team.

1. A serious accident involves one or more of the following occurrences:
 - a. A fatality.

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3.0 INSTRUCTIONS (Continued)

- b. Hospital confinement of five injured TVA employees resulting from a single incident.
 - c. Damage to TVA property of \$250,000 or more.
 - B. Other crane accidents and "near-miss" incidents are to be formally investigated using the crane coordinator or equivalent as part of a site appointed investigation team.
 - 1. Use form TVA 18002, "Management Report of Accident Property Damage," to report property damage accidents.
- 3.1.5 The Nuclear Maintenance central crane coordinator shall ensure site overhead handling programs are periodically evaluated and shall represent NP on agency committees including the following:
 - A. Perform overhead handling program reviews at each site based on the requirements of this Standard.
 - B. Coordinate and participate in the annual crane program review by Occupational Health and Safety using the "Criteria for the Safe Operation of TVA Cranes" as the baseline.
 - C. Represent Nuclear Power on a TVA standing committee to periodically review TVA's crane operations and to update the criteria document per the guidelines of Section 14.0 of the "Criteria for the Safe Operation of TVA Cranes."
- 3.2 Overhead and Gantry Cranes - this section provides requirements for the inspection, testing, maintenance, and operation of overhead and gantry cranes, including reactor, auxiliary, turbine, and radwaste building cranes, shop cranes, and any other cranes having the same fundamental characteristics.
 - A. Operation of overhead and gantry cranes shall be performed as follows:
 - 1. Cab, cab/pendant, and radio-operated overhead cranes shall only be operated by certified operators, by trainees under the direct supervision of a certified operator, or by a certified annual inspector during performance of that inspection.
 - 2. Floor-operated (pendant-controlled) cranes shall be operated by qualified operators.
 - 3. Operating practices including operator conduct, load handling, and signals, as contained in MGP-M-175 shall be adhered to.

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4. The crane shall not be loaded beyond its rated capacity except for rated-load test or for "special overrated load lifts" (see Appendix A) on non-safety-related cranes.

CAUTION Side-loading is considered a High Hazard Lift and, while not recommended, may be performed by coordinating with Nuclear Engineering to determine necessary special precautions.

- B. Inspection of overhead and gantry cranes shall be performed as follows:

1. Before initial use, all new, reinstalled, modified, or extensively repaired cranes shall be inspected in accordance with the annual/periodic inspection requirements of this section.
2. Before using this equipment, a visual inspection shall be performed by the operator assisted as necessary by qualified personnel. This inspection shall be valid until the operator leaves the plant/site, unless there has been another operator operating the equipment, whereupon, the crane shall be reinspected. Criteria for the preoperational inspection are included in the MGP-M-175. A log book shall be maintained for each overhead crane to verify completion of this inspection.
3. A periodic, visual inspection shall be performed annually by a Power Services Shops (PSS) certified overhead crane inspector for all overhead cranes in regular use. Criteria governing this inspection are included in the MGP-M-175. Documentation shall be performed as required by Section 5.0.

NOTE NDE of hooks is to be performed by qualified NQA inspectors.

4. Overhead cranes that have been idle for more than one month, but less than six months, shall receive preoperational and wire rope inspections before use. Overhead cranes that have been idle for more than six months shall receive the annual/periodic inspection before use. The log book, or similar means, shall be used to determine which cranes are classified in this category.
5. Inaccessible cranes (e.g., reactor building polar cranes) that have been idle for more than six months shall receive preoperational and wire rope inspections by a PSS certified inspector prior to use. Inaccessible cranes shall receive a periodic inspection at least once per normal refueling cycle at operating sites.

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3.0 INSTRUCTIONS (Continued)

C. Testing of overhead and gantry cranes shall be performed as follows:

1. Before use, all new, reinstalled, altered, repaired, or modified overhead cranes shall be tested to ensure proper operation in accordance with the vendor's operation manual. As a minimum the following functions shall be verified:
 - a. Hoisting and lowering characteristics verified with vendor requirements.
 - b. Trolley and bridge travel checked for smooth starting, controlled stopping, and speed, in compliance with the manufacturer's specification.
 - c. Limit switches (hoisting, lowering, and bridge and trolley travel) checked for proper operation.
2. Before initial use, all new cranes shall be load-tested, using the provisions of MGP-M-175, with the test load as 125 percent of the rated load. For cranes that have been extensively repaired, modified, or altered, with resulting unknown load-carrying capability, only the affected parts or components of the crane must be load tested to 125 percent of rated load.

NOTE If the rope and end connections have been tested and certified by the manufacturer, replacement of running wire rope does not require a rated-load test. If the end connections are installed onsite, the rope must be load tested.

D. Maintenance of overhead and gantry cranes shall be performed as follows:

1. Maintenance personnel shall be qualified in accordance with this Standard to perform corrective maintenance on overhead cranes (with special consideration given to energized controls).
2. Before initiating maintenance activities, the following precautions shall be followed:
 - a. The crane to be repaired shall be moved to a location where it will cause the least interference with other cranes and operations in the area.
 - b. Barricades and/or flagging shall be provided to keep personnel clear of the maintenance area beneath the crane.

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- c. All controllers shall be placed in the "off" position unless they are required for maintenance.
 - d. The main power source shall be disconnected and tagged in accordance with site clearance procedures unless main power is required for performance of maintenance.
3. The crane shall not be restored to service after corrective maintenance until all guards have been reinstalled, safety devices verified operational, functional test performed, and maintenance equipment removed.
 4. Corrective measures in accordance with the site work control program shall be implemented for all rejected conditions that affect the safe operation of the crane. Corrective measures shall be made before the crane is restored for service.
 5. Repair of load-sustaining crane members by welding shall be coordinated with Nuclear Engineering.
 6. A preventive-maintenance and lubrication program based on manufacturer recommendations shall be established and site implementing procedures or instructions issued. The lubrication program requirements may be accomplished using existing TVA oil sample analysis services provided by Central Laboratories Services Branch.

3.3 Mobile Cranes

This Section provides requirements for the inspection, testing, maintenance, and operation of mobile cranes, including fixed-boom cranes (crawler, truck-mounted, and ringer), hydraulic telescoping boom cranes (rough terrain and truck-mounted), commercial truck-mounted cranes, and any variations thereof that retain the same fundamental characteristics.

A. Operation of mobile cranes shall be performed as follows:

1. Mobile crane operators shall be certified in accordance with this Standard on each type of crane they operate.
2. The operator shall be familiar with the assigned crane type, understand applicable portions of the manufacturer's operating manual, and be able to read and understand the load chart.
3. The right crane shall be selected for the job, depending on the weight of the load, radius needed, height to be lifted, and clearances required for machine and boom. The range diagram shall be used to assist in determining the crane configuration and clearances.

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3.0 INSTRUCTIONS (Continued)

4. Mobile cranes shall be set up in accordance with the manufacturer's operating manual and the following:
 - a. Use the range diagram to assist in determining the crane configuration and clearances.
 - b. Ensure the ground on which the crane sits is reasonably level, well-compacted, stable enough to support the weight of the crane and its load, and has no underground structures which could be collapsed.
 - c. Ensure firm footing under both crawler tracks, all tires, or individual outrigger pads.
 - d. Use outriggers whenever possible with the outrigger beams fully extended.
 - e. Use the "on rubber" load chart if outriggers are not fully extended or not used.
 - f. Level the crane utilizing leveling bubbles or a carpenter's level.
 - g. Do not load the crane beyond the specifications of the load-rating chart except for test purposes.
 - h. Determine the weight of the load to be lifted such that it does not exceed the crane capacity ratings at the selected radius.
 - i. Observe clearances near power lines in accordance with MGP-M-175.
5. Approved barricades shall be provided to prevent entry into hazardous areas near and especially behind the crane.
6. The deck and operator area shall be kept clean and free of oil, grease, rags, cables, chains, and other hazards. Loose parts shall be kept in a tool box. Non-flammable solutions shall be used for cleaning. Shoes shall be clean and dry before operating.
7. Power lines shall be deenergized and grounded where possible. If this is not possible, high hazard lift requirements in accordance with Subsection 3.2.B shall be met in maintaining minimum clearances per ANSI and OSHA guidelines.

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8. The load should be handled smoothly. Slack shall be kept out of hoist line and rigging to avoid impact loading. Impact loads from acceleration or deceleration (quick stops) can overload the crane and/or rigging.

9. A qualified person shall oversee assembly and disassembly of mobile cranes. If the configuration is changed, such as a boom section added or removed, a qualified person or Power's Heavy Equipment Department shall be consulted to ensure the change conforms to the manufacturer's specifications.

10. Special operational requirements shall be implemented with respect to weather conditions to address the following situations:

- a. Operating wind velocity limits of the equipment based on manufacturer's recommendations.
- b. Derating procedures to be instituted in winds of sufficient force to affect the crane loading.
- c. A wind velocity action level for termination of lifting activities.
- d. A wind velocity action level for instituting anchoring procedures, including the lowering and tying down of booms using cribbing as required by manufacturer's specifications.
- e. A derating procedure for the buildup of ice on crane booms in locations where ice buildup is possible.
- f. A warning to all operators and mechanics that shock loading or impact in temperatures below freezing may result in brittle fractures of the steel.
- g. A procedure for lowering and anchoring booms during a severe weather warning or when the equipment is left unattended, which includes the maintenance of clear areas for lowering booms on proper cribbing without delay and, in the case of booms which cannot be lowered because of size, the requirements for attaching the load line to suitable anchors.
- h. An inspection requirement for cranes which have been subjected to severe weather.

B. Inspection of mobile cranes shall be performed as follows:

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3.0 INSTRUCTIONS (Continued)

1. Before initial use all new, modified, and newly erected cranes are to be inspected in accordance with the periodic (annual) inspection requirements by a certified inspector from Power's Heavy Equipment Department/Crane Inspection Unit.

NOTE Boom configuration changes do not mandate a periodic (annual) inspection.

2. A visual inspection shall be performed by the operator before use. The preoperational inspection criteria in MGP-M-175 shall be used. Results of this inspection will be recorded in a log book maintained in the crane cab.
3. A documented visual inspection shall be performed monthly for cranes in regular use on running wire rope in accordance with MGP-M-175.
4. A complete inspection shall be performed annually on all mobile cranes in regular use using the applicable annual inspection criteria in MGP-M-175. Inspections shall be performed by certified inspection personnel from Power's Heavy Equipment Department/Crane Inspection Unit.

NOTE NDE of hooks is to be performed by qualified NQA inspection personnel.

5. A crane that has been idle for a period of one month or more, but less than six months, shall be inspected using the monthly inspection criteria.
 6. A crane that has been idle for over six months shall be inspected using the annual inspection criteria.
 7. Standby cranes shall be inspected at least semi-annually using the annual inspection criteria.
- C. Testing of mobile cranes shall be performed as follows:
1. Any new crane, or any crane that has been disassembled, transported, and reassembled shall be tested to ensure operational requirements are in accordance with the vendor's operating manual. Functions tested shall include:
 - a. Load lifting and lowering mechanisms.

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- b. Boom lifting and lowering mechanisms.
 - c. Boom extension and retraction mechanisms.
 - d. Swinging mechanisms.
 - e. Travel mechanism.
 - f. Safety-devices.
2. All cranes in which load-sustaining parts have been altered, replaced, or repaired shall be load-tested. Replacement of the rope is specifically excluded from this requirement. The following considerations shall be observed:
- a. No modifications or additions that affect the safe operation of the crane shall be made without the manufacturer's approval.
 - b. Test loads shall not exceed 110 percent of the rated load at any selected working radius.
 - c. Written reports showing test procedures and confirming the adequacy of repairs or alterations shall be made a part of the permanent equipment record.
- D. Maintenance of mobile cranes shall be performed as follows:
- 1. Lead maintenance personnel shall be qualified in accordance with this Standard to perform maintenance on mobile cranes.
 - 2. Before making adjustments or repairs on a crane, the following precautions shall be taken as applicable:
 - a. The crane shall be placed where it will cause the least interference with other equipment or operations in the area, and the work area shall be barricaded.
 - b. The boom shall be lowered to the ground, if possible, or otherwise secured against dropping.
 - c. The load-block shall be lowered to the ground or otherwise secured against dropping.
 - d. All controls shall be put in the "off" position and all operating features secured from inadvertent motion by brakes, pawls, or other means.
 - e. Starting means shall be rendered inoperative.

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3.0 INSTRUCTIONS (Continued)

- f. The power plant shall be stopped or disconnected at the power takeoff source.
- g. Before hydraulic components are lowered or removed, hydraulic oil pressure shall be relieved from all hydraulic circuits.
- 3. After adjustments and repairs have been completed, the crane shall not be returned to service until all guards have been reinstalled, trapped air has been removed from the hydraulic system, safety devices have been verified operational, and maintenance equipment has been removed.
- 4. A preventive maintenance program based on manufacturer's recommendations shall be established for mobile cranes owned by Nuclear Power.
- 5. Replacement parts shall be obtained from the manufacturer or in accordance with manufacturer's specifications.
- 6. All identified deficiencies affecting safe operation of the crane shall be corrected prior to additional operation.

CAUTION No derating of mobile cranes because of any deficiencies affecting safe operation is allowed by anyone except the crane manufacturer.

3.4 Monorail Systems, Underhung Cranes, Overhead Hoists, and Base-mounted Drum Hoists

This section provides requirements for the inspection, testing, maintenance, and operation of the subject equipment and any variation thereof that retain the same fundamental characteristics.

- A. Operation of this overhead handling equipment shall be performed as follows:
 - 1. Power-operated hoists shall be operated according to the following guidelines:
 - a. Operation of power-operated hoists shall be limited to the following personnel:
 - (1) Qualified pendant crane operators.
 - (2) Maintenance and test personnel in performance of their duties on the hoist or crane.

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- (3) Qualified Inspectors.
 - (4) Personnel receiving on-the-job training (OJT) from a qualified pendant crane operator.
 - b. Operators of this equipment shall be qualified in accordance with this Standard for pendant crane operators.
 - c. Operating practices include operator conduct, load handling, and signals, and are the same as for overhead and gantry crane operators.
2. Manually operated hoists shall be operated according to the following:
- a. Operators of manually powered hoisting equipment shall be qualified rigging personnel, and shall adhere to the following practices:
 - (1) The operator shall not engage in any practice that will divert attention from the hoist.
 - (2) Any hold tag on the hoist shall be removed only by authorized personnel before use of the hoist.
 - (3) Before using the hoist, the operator shall verify that all employees are clear of the area.
 - (4) The operator shall be familiar with the equipment and its proper care.
 - (5) The operator shall have safe access to the hand chain.
 - (6) Hand chain-powered hoists shall never be operated by other than hand power.
 - (7) No handle extensions shall be used with ratchet hoists (come-alongs).
 - b. The rated load shall not be exceeded except for load tests.
 - c. The limitations assigned to the use of support structures for portable hoists shall be based on the determinations of a competent engineer designated by plant management. Determinations shall be documented and recorded appropriately.
 - d. The load shall be attached in the following manner:

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3.0 INSTRUCTIONS (Continued)

- (1) The hoist chain shall not be wrapped around the load.
- (2) The load shall be attached to the hook by means of slings or other approved devices.
- (3) The slings or other approved devices shall be seated properly in the saddle of the hook before operating.

e. The load shall be moved in the following manner:

- (1) Before starting to lift, the chain shall be properly seated in the sprockets.
- (2) The load shall not be moved or lifted more than a few inches until it is well balanced in the sling or lifting device.
- (3) Hoists shall not be operated until they are centered over the load to be lifted.
- (4) The operator shall avoid carrying loads over people.
- (5) The operator shall test braking mechanisms each time a load approaching rated-capacity is handled.
- (6) The operator shall not leave the load suspended unless the hand chain has been secured, and specific precautions have been taken to provide protection.

B. Inspection of monorail systems, underhung cranes, overhead hoists, and base-mounted drum hoists shall be performed as follows:

1. All equipment shall be visually inspected before use in accordance with the criteria provided in MGP-M-175.
2. A visual inspection of running wire rope shall be performed annually, in accordance with the criteria of MGP-M-175, for monorail systems, underhung cranes, overhead hoists, or base-mounted drum hoists that use running wire rope.
3. A thorough, visual inspection shall be performed annually by qualified inspection personnel on all equipment in regular use. This inspection shall be in accordance with the periodic inspection criteria of MGP-M-175.

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NOTE NDE inspection of hooks are to be performed by qualified NQA inspection personnel.

4. Before use, equipment that has been idle for one month or more, but less than twelve months, shall be inspected in accordance with applicable preoperational requirements.
 5. Equipment that has been idle for more than twelve months shall be inspected in accordance with preoperational and periodic inspection requirements prior to use.
- C. Testing of monorail systems, underhung cranes, and overhead and base-mounted drum hoists shall be performed as follows:
1. All power operated hoists shall be operationally tested before initial use if they are (1) new, (2) have been altered, or (3) have been idle for more than 12 months. These tests for proper operation shall include the following functions:
 - a. Trolley travel (if applicable).
 - b. Bridge travel (if applicable).
 - c. Hoisting and lowering.
 - d. Travel-limiting device (if applicable).
 - e. Locking and safety-devices for interlocking mechanisms, track switches, drop sections, lift sections, etc., as applicable.
 2. All manually powered hoists shall be operationally tested if they have been altered, repaired, or idle for more than 12 months. The following areas shall be tested:
 - a. All functions of the hoist, including hoisting and lowering, shall be checked with the hoist suspended in the unloaded state.
 - b. After testing in the unloaded state, a load of 50 pounds times the number of load-supporting parts of the chain shall be applied to the hoist in order to check proper control.
 3. All equipment shall be load-tested before initial use if it is new, extensively repaired, or altered, and a written report shall be furnished confirming the load-rating of the system. The following test consideration shall be observed:

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3.0 INSTRUCTIONS (Continued)

- a. The load-rating shall not be more than 80 percent of the maximum load sustained during the test. Test loads shall not be more than 125 percent of the rated load.
 - b. On hoists incorporating overload devices that prevent the lifting of 125 percent rated load, a 100 percent load-test shall be performed, after which the function of the overload device shall be tested.
- D. Maintenance of monorail systems, underhung cranes, and overhead and base-mounted drum hoists shall be performed as follows:
1. The following maintenance precautions shall be observed:
 - a. Power-operated monorail systems or underhung cranes shall be repaired in an area that causes the least interference with other operations. No personnel shall be under the trolley or hoist unless required for performance of hoist maintenance.
 - b. All controllers are to be in the "off" position unless required for the maintenance to be performed.
 - c. The main power source shall be tagged in the deenergized position unless required for maintenance to be performed.
 - d. Hold tags shall be placed on each monorail system, underhung crane, or overhead hoist until maintenance is completed.
 - e. After repairs and adjustments have been made, the equipment shall not be operated until guards have been reinstalled, safety devices verified operational, and tools and maintenance equipment removed.
 2. Corrective maintenance shall be performed to correct any unsafe conditions identified in the preoperational, or periodic inspection shall be corrected before the equipment is returned to service.
 3. A preventive maintenance and lubrication program based on manufacturer recommendation shall be established. The lubrication program requirements may be accomplished utilizing existing TVA oil sample analysis services provided by Central Laboratories.

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3.5 Rigging

This section provides requirements for the inspection, testing, maintenance, use and control of rigging equipment, including wire rope and synthetic slings, lifting beams, spreader bars, turnbuckles, eyebolts, shackles, or any other devices used to attach a load to a crane or hoist hook.

- A. All rigging equipment applicable to this section shall be used in accordance with the qualification requirements and safe operating practices listed below:
1. Only qualified rigging personnel shall be used in performing rigging operations.
 2. All rigging equipment shall be used in accordance with the safe operating practices and conduct for rigging personnel listed in MGP-M-175.
 3. The "Handbook for Riggers", by W.G. Newberry, is the reference guide for rigging to be used by Nuclear Power employees.
- B. Inspection of rigging equipment as listed in Table 3.5-1 shall be performed as follows:
1. An initial inspection shall be performed on all new rigging equipment in Group A before use in accordance with criteria listed in MGP-M-175.
 2. A preoperational inspection shall be performed on rigging equipment in Group B before each use in accordance with applicable criteria listed in MGP-M-175.
 3. A periodic inspection shall be performed on all rigging equipment in Group C at intervals no greater than 12 months in accordance with the criteria listed in MGP-M-175.
 4. Periodic inspections on NUREG-0612 special lifting devices in Group D shall be performed by qualified inspection personnel in accordance with the criteria as prescribed by ANSI N14.6 or ASME B30.9 as defined in Section 5.0 under "Rigging Equipment." Inspection intervals are established in accordance with specific NRC commitments at each site.

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TABLE 3.5-1

RIGGING INSPECTION GROUP ASSIGNMENT

<u>Rigging Equipment</u>	<u>Inspection Groups</u>			
	A	B	C	D
1. Slings/Chokers	X	X	X	
2. Spreader Bars	X	X	X	
3. Lifting Beams	X	X	X	
4. Lifting Eyes (rings)	X	X		
5. Special Lifting Devices (NUREG 0612)	X	X		X
6. Shackles	X	X		
7. Turnbuckles	X	X		
8. Snatch Blocks	X	X		
9. Links, Rings, Swivels, Eye Bolts	X	X		
10. Clamps	X	X		
11. Plate Dogs	X	X		
12. Wire Rope Clips	X	X		

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C. Testing of rigging equipment shall be performed as follows:

1. Proof testing by Nuclear Power personnel of used slings, either wire rope or synthetic, shall not be allowed.

NOTE Proof-testing of wire-rope or synthetic slings is performed by the manufacturer on new slings as required by procurement specification or ASME B30.9.

2. Functional and proof testing of special lifting devices is to be performed in accordance with the following:

- a. Special lifting devices used to handle heavy loads (NUREG-0612) are tested in accordance with ANSI N14.6 requirements.

- b. Special lifting devices not used to handle heavy loads are tested in accordance with ANSI B30.20 requirements.

D. Maintenance of rigging equipment shall be performed as follows:

1. All rigging equipment shall be maintained in accordance with manufacturer's requirements unless otherwise authorized by Nuclear Engineering.

2. Rigging equipment that is frayed, worn, or otherwise deteriorated shall not be used.

3. All defective wire-rope slings shall be destroyed.

4. Rigging items such as hooks, shackles, and turnbuckles that appear to have yielded or are distorted shall not be used.

5. A preventive maintenance program based on manufacturer recommendations shall be implemented to:

- a. Ensure wire-rope slings and rigging hardware subjected to harsh environment are properly lubricated.

- b. Ensure special lifting devices are periodically lubricated.

- c. Ensure rigging equipment is kept clean and free of contaminants that are detrimental to the materials being handled.

- d. Ensure seals for hydraulic or pneumatic components on special lifting devices are replaced within the expected service life of the seals.

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Page 24 of 393.0 INSTRUCTIONS (Continued)

E. Control of rigging equipment shall be accomplished as follows:

1. All slings are to be permanently identified with a unique identification number, vertical rated capacity, and storage location, if practical, by one or more of the following methods:
 - a. Attach an identification tag with the required information.
 - b. Use low-stress, round-nose dies to stamp the required information on mechanical-end fittings (1/8-inch for slings up to 1-inch in diameter, and 1/4-inch for slings greater than 1-inch in diameter).
 - c. Use intermittent dot dies to stamp the required information.
 - d. Use etching or engraving pencil on mechanical end fittings to provide the required information.

NOTE

If traceability on a sling is lost, the sling shall either be (1) destroyed; or if it is a wire-rope sling constructed using a flemish-eye splice with a mechanical swage fitting, the rope core is IWRC, and the sling meets periodic inspection requirements; (2) derated to 70% of the vertical rated capacity of improved plow steel wire rope slings.

2. All spreader bars, lifting beams, and special lifting devices are to be permanently identified by a unique identifier that provides traceability, including the storage location, manufacturer's name and serial number (if applicable), device's weight (when greater than 100 pounds), and rated load.
3. All slings, chokers, spreader bars, lifting beams, and special lifting devices are to be color coded annually to verify current inspection status.
4. Slings and standard rigging hardware are to be purchased in accordance with TVA standard procurement specifications when possible.
5. Specially designed slings and special lifting devices are to be purchased in accordance with Nuclear Engineering requirements.

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6. Adequate storage for all rigging equipment is to be provided in accordance with manufacturer or Nuclear Engineering recommendations, and the following requirements apply at each site:

- a. Storage locations are to be established in areas where rigging equipment is protected from mechanical damage, excessive heat, sparks, moisture, acid fumes, etc.
- b. Access to each storage location is to be by either personnel presence or by a lock to prevent unauthorized usage of rigging equipment.

NOTE Rigging equipment (such as large slings or lifting devices), which requires mechanical means of removing from the storage location, is exempt from the secured access but not from adequate protection.

- c. A capacity chart reflecting ASME B30.9 requirements for the three basic hitches for slings shall be posted at each storage location.

7. Control of rigging equipment issuance/receipt shall be established to ensure the following:

- a. Qualified rigging personnel issue, receive, and inspect all rigging equipment at designated storage locations.
- b. Only qualified rigging personnel are issued rigging equipment from the designated storage locations.
- c. Rigging equipment that has been damaged is tagged out using a defective equipment tag (TVA 18004), removed from service, and as appropriate, repaired or destroyed.
- d. Rigging equipment that has been damaged or destroyed is reported to the responsible supervisor and/or the crane coordinator to update equipment records and evaluate the cause.
- e. Avoid surface damage to stainless steel by preventing direct contact of carbon steel rigging equipment with stainless steel except when attached to lifting lugs, eyes, or pads.

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3.6 Control of Heavy Loads (NUREG-0612) - All sites that are operational have overhead handling systems that are used to handle heavy loads in the area of the reactor vessel, near spent fuel in the spent fuel pool (SFP), or in other areas where an accidental drop may damage safe shutdown systems. Accordingly, each operational site has addressed NRC concerns on NUREG-0612 through implementation of guidelines contained in this section.

- A. Administrative controls shall be established at each site to control heavy loads in accordance with the following:
1. Safe load paths are to be established for the movement of heavy loads by:
 - a. Clearly defining in procedures and/or equipment layout drawings.
 - b. Discussing in detail with the crane operator and rigging/flagging personnel before each heavy load lift.
 - c. Clearly marking the path on the floor where practical.
 - d. Obtaining Plant Operation Review Committee approved deviations from defined safe load paths.
 2. Load handling procedures shall be developed for heavy loads to include:
 - a. Identification of required equipment.
 - b. Inspections and acceptance criteria required before movement of the load.
 - c. Steps and proper sequence to be followed in handling the load including weights, sling locations, balance points, methods of attachment, and other pertinent features to be considered as necessary.

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3.0 INSTRUCTIONS (Continued)

- d. Safe load path.
 - e. Special handling precautions due to the weight, size, susceptibility to shock damage, high nil ductility transition temperatures, or any conditions that warrant special consideration.
 - f. Miscellaneous lifts in critical lifting zones shall be limited to 50% of the crane/hoist rated capacity, and rigging equipment shall be rated at twice the weight of the load.
- 3. Crane operators are verified to be certified or qualified in accordance with this Standard.
 - 4. NUREG-0612 Special Lifting Devices shall satisfy the guidelines of ANSI N14.6 including a minimum factor of safety of 5 to 1.
 - 5. Ensure lifting devices that are not specially designed are maintained and used in accordance with the guidelines of ANSI B30.9 including a minimum factor of safety of 5 to 1.
 - 6. A crane or hoist used for heavy load lifts shall comply with the inspection, testing, and maintenance requirements of this Standard before each identified lift.
 - 7. Heavy load handling cranes or hoists must meet the applicable criteria and guidelines of the applicable ANSI standard for which the hoist was designed.

4.0 RECORDS

4.1 QA Records

- A. Periodic (annual) inspections for safety-related cranes, hoists, and NUREG-0612 special lifting devices.
- B. Crane lift records including heavy load lifts and high hazard lifts made using safety-related cranes or hoists shall be maintained along with the work package under which the lift was made.

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- C. Rated-load test records and certificates of conformance for safety-related cranes, hoists, and NUREG-0612 special lifting devices.
- D. Equipment maintenance records for safety-related cranes, hoists, and NUREG-0612 special lifting devices including Work Request and Preventive Maintenance (PM) records.
- E. Engineering records for safety-related cranes, hoists, and NUREG-0612 special lifting devices including design drawings, design/engineering change notices, modifications, special overrated load lift evaluations, plant preoperational test records, vendor manuals, and engineering calculations.

4.2 Non-OA Records

- A. Training, qualification, and certification records for operators, rigging, and lead maintenance personnel, and annual inspectors of cranes, hoists, and rigging equipment.
- B. Crane lift records of high hazard lifts made using non-safety-related cranes or hoists shall be maintained along with the work order under which the lift was made.
- C. Rated-load test records and certificates of conformance for non-safety related cranes, hoists, and rigging equipment.
- D. Equipment maintenance records for nonsafety-related cranes, hoists, and rigging equipment including WR and PM records.
- E. Monthly and periodic (annual) inspections for nonsafety-related cranes and hoists.
- F. Annual inspection of all rigging equipment (except NUREG-0612 special lifting devices).
- G. Engineering records for nonsafety-related cranes, hoists, and rigging equipment including design drawings, design/engineering change notices, modifications, special overrated load lift evaluations, plant preoperational test records, vendor manuals, and engineering calculations.

5.0 DEFINITIONS

Crane - A device defined by the appropriate ANSI standards as follows:

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5.0 DEFINITIONS (Continued)

- A. B30.2, "Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)"
- B. B30.3, "Hammerhead Tower Cranes"
- C. B30.4, "Portal, Tower, and Pillar Cranes"
- D. B30.5, "Mobile and Locomotive Cranes" (Includes old ANSI B30.15 "Mobile Hydraulic Cranes")
- E. B30.7, "Base Mounted Drum Hoists"
- F. B30.8, "Floating Cranes and Floating Derricks"
- G. B30.11, "Monorails and Underhung Cranes"
- H. B30.16, "Overhead Hoists (Underhung)"
- I. B30.17, "Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)"

NOTE The following equipment, for purposes of this document, is excluded:

1. Machines designed specifically for backhoe, dragline, or shovel operations.
2. Conveyors, elevators, and "sky-climbers."
3. Equipment covered by ANSI A92.2, "Vehicle-Mounted Elevating and Rotating Aerial Devices."

Crane Coordinator - A full-time qualified person designated at the plant or site who is responsible for the overall coordination of crane activities. The crane coordinator shall be uniquely qualified by experience and training in crane operations, and in rigging and flagging, for all crane-related equipment being used at the site.

Critical Lift Zone (CLZ) - Areas, whether permanent or temporary, in designated strategic regions of the plant where a load-drop impact could potentially release radioactive material into the environment or prevent equipment from functioning that may be required to achieve and maintain safe shutdown.

Heavy Load Lift (NUREG-0612) - Any load carried in a CLZ after a plant becomes operational that weighs more than the combined weight of a single-spent fuel assemble and its associated load-handling tool for the specific plant.

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High Hazard Lift (excluding heavy load lift) - The following are types of high hazard lifts:

- A. Any lift that could cause significant damage to equipment or injury to personnel due to unspecified hazards, or to any of the following conditions:
 - 1. When a capacity or near-capacity lift is being made at 85 percent of rated capacity for overhead cranes, 100 percent for monorails and other similar cranes, or 85 percent of rated capacity for mobile cranes.
 - 2. When a special overrated load lift is made (see Appendix A).
 - 3. When operating on an inherently hazardous location or under severe weather or emergency conditions.
 - 4. When operating with specific operational limits due to abnormal conditions existing with equipment, load, rigging, or facilities.
- B. Any lift whose failure could damage a high-value, long-lead time procurement item, or could have significant impact on plant operations, shutdown, or equipment availability.
- C. Any lift in which the crane working clearances to adjacent equipment or electrical powerlines are within plus 10 percent of minimum clearances specified in the ANSI standard for the respective crane, excluding approved hotline work.
- D. Any lift utilizing more than one crane or one hook.
- E. Any lift of personnel with platforms attached to a load line.
- F. Any lift of material or equipment over personnel (under special or unique conditions requiring such lifts).

Miscellaneous Lift (in CLZ) - A NUREG-0612 lift not previously defined which is limited to 50% of the crane/hoist rated capacity and is made using rigging equipment rated for twice the load weight.

Qualified Person - An individual who possesses a recognized degree, certificate of professional standing or record of training, and experience that successfully demonstrates his/her ability to solve problems and perform work related to the subject matter.

Rigging Equipment - Any hardware used to suspend a load from a crane, including items used between the load block and the load. This includes equipment defined in the following ANSI/ASME standards:

- A. B30.9, "Slings."
- B. B30.10, "Hooks."

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5.0 DEFINITIONS (Continued)

- C. B30.20, "Below-the-Hook Lifting Devices."
- D. N14.6, "American National Standard for Radioactive Materials - Special Lifting Devices for Shipping Containers Weighing 10,000 (4500 kg) Pounds or More."

Specific hardware in this definition includes off-the-shelf type items such as slings (wire-rope and synthetic), chains, spreader bars, lifting beams, lifting eyes or rings, shackles, wire-rope clips, turnbuckles, hooks, clamps, and plate clamps as well as specialty items for the handling of nuclear components/equipment. Sometimes off-the-shelf items are used with/as part of special lifting devices to perform NUREG-0612 lifts. Typically, the off-the-shelf items are design/inspected/tested in accordance with ASME B30.9 or other applicable standards while the specialty items must meet the ANSI N14.6 requirements. Generally, these requirements apply to critical load bearing welds or members.

Safe Load Path (NUREG-612) - A path defined for transport of a "heavy load" that will minimize adverse effects in terms of releases of radioactive material and damage to safety systems if the load is dropped. This path is administratively controlled by procedures and/or clearly outlined by markings on the floor where the load is to be handled. It may also be enforced by mechanical stops and/or electrical interlocks.

Special Overrated Load Lifts (Overhead Cranes) - High hazard lifts that are in excess of the rated capacity of the crane. Each instance is a specific problem which must be formally addressed as outlined in this Standard.

6.0 SOURCE DOCUMENTS

"Criteria for the Safe Operation of TVA Cranes"

"NRC Generic Letter 81-07 (NUREG-0612, Control of Heavy Loads)"

"TVA Nuclear Quality Assurance Plan"

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APPENDIX A

HIGH HAZARD LIFTS

1.0 OPERATIONS INVOLVING LIFTING OF PERSONNEL

When personnel are to be lifted, the following special procedures are followed:

- 1.1 The person on the jobsite specifically responsible for the overall work function to be performed determines that there is no practical alternate way to perform the needed work, and authorizes lifting of personnel using either overhead or mobile cranes.
- 1.2 For each instance of such lifting, the person responsible for the task attests to the need for the operation by issuing a statement describing the operation and its timeframe, and determines that each of the following requirements have been met:
 - A. Before lifting personnel, ensure monthly and annual inspections are current, and perform a preoperational inspection with special emphasis on wire-rope condition.
 - B. Prepare prelift plans in accordance with the High Hazard Lift Plan sample in this appendix.
 - C. If a mobile crane is to be used, ensure the total weight of the loaded personnel platform and related rigging does not exceed 50% of the rated capacity for the radius and configuration.
 - D. Make a full-cycle operational test lift before lifting personnel with the platform loaded to the anticipated lift weight.
 - E. Conduct a meeting attended by the crane operator, signal person, person(s) to be lifted, and the person responsible for the task to be performed to plan and review procedures to be followed. This includes procedures for entering and leaving the man-lift platform and the points at which persons will enter and leave the platform.
 - F. Maintain positive communication between the crane operator, signal person, and person(s) being lifted. Visual contact between the operator and signal person must be maintained even if audible communication is being used.
 - G. All lifts are made with NE-approved personnel lifting platforms with the following exception. Manufacturer supplied personnel lifting platforms meeting OSHA [29 CFR 1926.550(g)] are considered acceptable for use without specific NE evaluation and approval.

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- H. A firm footing for mobile cranes is provided so that the crane can be level. For mobile cranes, outriggers are used when hoisting employees.
- I. For a mobile crane, verify the stability of the footing during the full-cycle operational test.
- J. The load line on which the platform is suspended shall have control load lowering. The free-fall option shall not be used with suspended work platforms. Maximum speed shall not exceed 100 feet per minute.
- K. Verify warning or limiting devices are installed to prevent two-blocking, unless audible communication has been provided for mobile cranes and one of the persons being lifted has been specifically assigned the task of warning of the approach of a two-block condition.
- L. When welding is done by an employee on the platform, ensure the electrode holders are protected from contact with metal components of the platform.
- M. Ensure employees on the platform wear safety belts with lanyards attached, preferably above the hook or shackle.
- N. Ensure the operator remains at the controls when the platform is suspended.
- O. Lifting bridles on working platforms suspended from cranes shall consist of four legs attached so that the stability of the platform is ensured. These shall be secured by a shackle or attached by a closed hook that cannot open due to load position in the hook.
- P. Ensure hook is equipped with a positive locking type hook latch.
- Q. Ensure standard hand signals are used unless voice communication equipment (telephone, radio, or equivalent) is used. Signals shall be visible or audible to the operator at all times.

2.0 OPERATIONS NEAR ELECTRIC POWER LINES OUTSIDE SWITCHYARDS

- 2.1 Know where the overhead power lines are located in the work area.
- 2.2 Treat all wires and electrical equipment as energized until confirmed with hold order. Preplan the work activity to identify and maintain clearance during the operation.

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- 2.3 When equipment is set up to operate within boom's length of the minimum clearance distance to power lines, develop a high hazard lift plan. The plan should cover all specific job activities and should be discussed with all persons involved in the operation.
- 2.4 Whenever possible, operate cranes near power lines only when they have been deenergized and visibly grounded at both sides of the point of work.
- 2.5 If necessary to work near energized lines, erect insulating barriers where possible to prevent physical contact with the lines. The barriers cannot be a part of or an attachment to the equipment or machine.
- 2.6 If necessary to work near energized lines without insulating barriers, observe the following restrictions:
- A. Maintain minimum clearances given in Table A-1.
 - B. Designate a person to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. Specifically, the qualified signal person is assigned to observe the clearance when the crane moves within a boom's length of the minimum clearance distance.
 - C. When cage-type boom guards, insulating links, or proximity warning devices are used on cranes, ensure such devices do not alter the requirements of any other regulation of this part, even if such devices are required by law or regulation.
 - D. Any overhead wire is considered to be an energized line unless and until the appropriate TVA systems dispatcher notifies that it is not an energized line and it has been visibly grounded.
 - E. Before working near transmitter towers where an electrical charge can be induced in the equipment or materials being handled, the transmitter is deenergized, or tests are made to determine if an electrical charge is induced on the crane. The following precautions shall be taken when necessary to dissipate induced voltages:
 - 1. Provide the equipment with an electrical ground directly to the upper rotating structure supporting the boom.
 - 2. Attach grounded jumper cables to material being handled by boom equipment when electrical charge is induced while working near energized transmitters. Provide crews with nonconductive poles having large alligator clips or other similar protection to attach the ground cable to the load.

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3. Remove combustible and flammable materials from the immediate areas prior to operation.
- 2.7 If after reviewing this procedure, any questions arise regarding crane operations near power lines contact the responsible supervisor or the crane coordinator for assistance.

TABLE A-1

REQUIRED CLEARANCE FOR OPERATIONS NEAR HIGH-VOLTAGE
POWER LINES AND FOR OPERATIONS IN TRANSIT
WITH NO LOAD AND BOOM FOR MAST LOWERED

<u>Normal Voltage, kV</u> <u>(Phase-to-Phase)</u>	<u>Minimum</u> <u>Required Clearance, ft</u>
Operation Near High-Voltage Power Lines	
0 to 50	10
Over 50 to 200	15
Over 200 to 350	20
Over 350 to 500	25
Over 500 to 750	35
Over 750 to 1000	45
Operation in Transit With No load and Boom or Mast Lowered	
0 to 0.75	4
Over 0.75 to 50	6
Over 50 to 345	10
Over 345 to 750	16
Over 750 to 1000	20

3.0 SPECIAL OVERRATED LOAD LIFTS

Before making lifts in excess of the rated load, the following requirements shall be met:

- 3.1 Nuclear Engineering must determine the accurate weight of the load to be lifted by use of approved drawings or calculations.

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3.0 SPECIAL OVERRATED LOAD LIFTS (Continued)

- 3.2 The maintenance history of the crane shall be reviewed, including reports of any prior special overrated load lifts.
- 3.3 Structural, mechanical, and electrical components of the crane design shall be checked by Nuclear Engineering.
- 3.4 The crane-supporting structural design shall be checked by Nuclear Engineering for conformance to AISC or other applicable design standards.
- 3.5 A complete periodic inspection of the crane shall be made just before making the lift. The crane support shall be inspected and any deterioration or damage shall be taken into consideration in Nuclear Engineering calculations.
- 3.6 The lift plan shall be approved with signatures by the Plant Manager/Project Engineer or their designees.
- 3.7 The lift shall be made as a high-hazard lift under the direction of a person designated by the responsible supervisor.
- 3.8 The operator shall test the crane during the special overrated load lift by lifting the load a short distance and allowing the brakes to set to assure they will hold the load.
- 3.9 Complete records of the lift shall be maintained by the crane coordinator.
- 3.10 After the special overrated load lift is concluded, a thorough inspection shall be made of all critical parts designated by Nuclear Engineering.

4.0 GENERAL REQUIREMENTS

In performing all high-hazard lifts, due consideration shall be given to the following:

- 4.1 Performance of the lift shall be evaluated based on weight, size, susceptibility to shock damage, high nil ductility transition temperatures, or any other conditions that warrant special consideration.
- 4.2 Special steps should be taken based on weights, sling locations, balance points, methods of attachment, maximum hoist line speeds, and other pertinent features affecting safe handling.

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HIGH HAZARD LIFT PLAN

I. CATEGORY OF HIGH-HAZARD LIFT (CHECK APPROPRIATE BOX)

- 1. PERSONNEL LIFT
- 2. SPECIAL OVERRATED LOAD LIFT
- 3. MULTI-HOOK/CRANE LIFT
- 4. LIFT OVER PERSONNEL
- 5. LIFTS NEAR ELECTRICALLY ENERGIZED POWERLINES, EQUIPMENT, AND SWITCHYARDS
- 6. NEAR CAPACITY LIFTS (85 PERCENT - OVERHEADS AND MOBILE CRANES)
(100 PERCENT - MONORAIL SYSTEMS AND OVERHEAD HOISTS)
- 7. SEVERE WEATHER CONDITIONS
- 8. ABNORMAL LIFT CONDITIONS DUE TO EQUIPMENT, LOAD, RIGGING, OR FACILITIES.
- 9. LIFT IN WHICH FAILURE COULD DAMAGE HIGH VALUE, LONG LEAD TIME PROCUREMENT ITEM OR SIGNIFICANTLY IMPACT PLANT OPERATIONS
- 10. LIFTS INVOLVING SIDE-LOADING OF CRANE/HOIST

II. 1. CRANE/HOIST ID _____ 2. LOCATION _____

3. LIFT DESCRIPTION: _____

4. WEIGHT OF LOAD _____

5a. CRANE/HOIST RATED CAPACITY _____ 5b. RADIUS (MOBILE) _____

6. RIGGING ID/SIZE _____ / _____

7. RIGGING CAPACITY FOR PRESCRIBED LIFT _____

8. PERSON-IN-CHARGE (PIC) _____

9. CERTIFIED/QUALIFIED OPERATOR _____

10. QUALIFIED RIGGER/FLAGGER _____

11. WORK REQUEST/WORK PACKAGE _____

III. PREREQUISITES TO PERFORMING HIGH-HAZARD LIFT (APPLICABLE CATEGORIES FROM SECTION I ARE IDENTIFIED IN PARENTHESES)

1. SITE CRANE COORDINATOR/RESPONSIBLE SUPERVISOR/ SIGNATURE DATE

COGNIZANT PERSON APPROVAL (ALL) _____ / _____

2. NUCLEAR PROJECTS APPROVAL _____ / _____

(2, 8, 10)

REF. NP CALC. PKG./DWG. _____

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	<u>SIGNATURE</u>	<u>DATE</u>
3. PERIODIC INSPECTION PERFORMED JUST PRIOR TO LIFT (2)		/
4. CRANE/HOIST IN COMPLIANCE WITH PERIODIC (ANNUAL) AND WIRE ROPE INSPECTION REQUIREMENTS (1, 3-10)		/
5. RIGGING/SPECIAL LIFTING DEVICE IN COMPLIANCE WITH PERIODIC (ANNUAL) INSPECTION REQUIREMENTS (ALL)		/
6. OPERATOR CERTIFICATION VERIFIED (ALL)		/
7. RIGGING/FLAGGING PERSONNEL QUALIFICATIONS VERIFIED (ALL)		/
8. PRE-LIFT COORDINATION MEETING WITH OPERATOR, RIGGERS/FLAGMAN, AND PIC COMPLETE (ALL)		/
9. PREOPERATIONAL CRANE/HOIST AND RIGGING INSPECTION COMPLETE (ALL)		/
10. SPECIAL REQUIREMENTS FOR "OPERATIONS INVOLVING LIFTING PERSONNEL" PER APPENDIX A OF STD-6.6 HAVE BEEN COMPLETED, INCLUDING PRE-LIFT FULL-CYCLE OPERATIONAL TEST (1)		/
11. SPECIAL REQUIREMENTS FOR "OPERATIONS NEAR ELECTRIC POWER LINES AND IN TRANSFORMER YARDS AND SWITCHYARDS" PER APPENDIX A OF STD-6.6 HAVE BEEN COMPLETED (5)		/
12. SPECIAL REQUIREMENTS FOR "SPECIAL OVERRATED LOAD LIFTS" PER APPENDIX A OF STD-6.6 HAVE BEEN COMPLETED EXCEPT FOR POST-LIFT INSPECTIONS (2)		/

<p>NP STANDARD</p>	<p>SAFE PRACTICES FOR OPERATION OF OVERHEAD HANDLING EQUIPMENT</p>	<p>STD-6.6 Rev. 0 Page 39 of 39</p>
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APPENDIX A (Continued)

SIGNATURE

DATE

IV. POST HIGH-HAZARD LIFT REQUIREMENTS

1. PERFORM POST-LIFT INSPECTION UNDER NUCLEARPROJECTS DIRECTION AFTER SPECIAL OVERRATED LOAD LIFT (2)

_____ / _____

2. FORWARD A COPY OF THIS COMPLETED FORM, ALONG WITH SUMMARY OF ANY PROBLEMS ENCOUNTERED BEFORE, DURING, OR AFTER THE LIFT, TO THE SITE CRANE COORDINATOR. THE ORIGINAL IS TO BE RETAINED AS PART OF THE WORK PACKAGE (ALL)

_____ / _____

V. COMMENTS INCLUDING ANY SPECIAL OR SPECIFIC REQUIREMENTS FOR PERFORMANCE OF THIS LIFT:

_____ / _____
 PIC Date