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12.0 HOISTS, JIB CRANES, AND MONORAIL SYSTEMS

12.1 SCOPE

This chapter applies to the marking, construction, installation, inspection, testing, maintenance and operation of the following:

- Underhung cranes and monorail systems,
- Hand chain-operated chain hoists and electric and air-powered chain and wire rope hoists
- Ratchet and pawl and friction brake type manually lever operated chain, wire rope, and web strap hoists used for lifting, pulling, and tensioning applications

The proper and safe use of hoists, jib cranes, and monorails is governed by the American Society of Mechanical Engineers (ASME) standards and Occupational Safety and Health Administration (OSHA) regulations. This section implements required criteria from DOE/RL-92-36 and the following standards: ASME B30.11-Monorails and Underhung Cranes, ASME B30.16-Overhead Hoists (Underhung), ASME B30.21-Lever Hoists, OSHA 29 CFR 1926 Subpart CC Overhead and Gantry Cranes (only applies to temporarily installed cranes), and OSHA 29 CFR 1910.179 Overhead and Gantry Cranes.

The responsible engineer may invoke ASME NUM-1, Rules for Construction of Cranes, Monorails, and Hoists (with Bridge or Trolley or Hoist of the Underhung Type), for cranes used at nuclear facilities. ASME NUM-1 applies to the design, manufacture, testing, inspection, shipment, storage, and erection of monorails and hoists (with bridge, trolley, or hoist of the underhung type).

This chapter implements the following criteria and the applicable national standards and/or federal specifications that are mandatory requirements for each item.

- ASME B30.11-Monorails and Underhung Cranes
 1. Construction and Installation, Chapter 11-1
 2. Inspection, Testing and Maintenance, Chapter 11-2
 3. Operation, Chapter 11-3
- ASME B30.16-Overhead Hoists (Underhung)
 1. Marking, Construction, and Installation, Chapter 16-1
 2. Inspection, Testing and Maintenance, Chapter 16-2
 3. Operator Training and Operation, Chapter 16-3
 4. Maintenance Training and Maintenance, Chapter 16-4
- ASME B30.21-Lever Hoists (*NOTE: Each chapter specifies marking, construction, inspection, testing, maintenance, and operation criteria*)
 1. Construction and Installation, Chapter 21-1
 2. Inspection and Testing, Chapter 21-2
 3. Operation and Operator Training, Chapter 21-3
 4. Maintenance and Maintenance Training, Chapter 21-4

12.2 GENERAL REQUIREMENTS

Contractors should access ASME via one of the following options:

1. IHS Engineering Standards, Regulations and Technical Specifications at <http://www.ihs.com/> . The contractor must have paid for access to the specific standard. To print IHS file go to <http://www.ihs.com/>

2. Thomson Reuters TECHSTREET ENTERPRISE at techstreet.subscriptions@thomsonreuters.com. The contractor must have paid for access to the specific standard.
3. To purchase standards directly from ASME go to <http://www.asme.org>
4. To access OSHA standards go to the following links
 - 29 CFR 1910.179 Overhead and Gantry Cranes
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9830
 - 29 CFR 1926.554 Overhead Hoists
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10764

12.3 IMPLEMENTATION

Contractors shall be compliant to OSHA, ASME, DOE/RL-92-36, and the hoist or jib crane or monorail manufacturers' requirements. It is the responsibility of the user of this manual to implement all of the requirements from listed sources. When two standards set forth inconsistent requirements, the user shall adhere to the standard containing the most stringent requirements. ASME standards provide the most comprehensive information. Users should contact a Hanford Hoisting and Rigging Committee (HHRC) representative or send an email to ^Hanford Hoisting and Rigging for a formal interpretation. See Chapter 17.0, *Interpretations*, for the process to be followed when requesting an interpretation. Notify the HHRC if any inconsistent standards are identified.

It is not the intent of this manual to require retrofitting of existing equipment. However, when any hoisting or rigging equipment is modified, its performance requirements shall be reviewed relative to the requirements within the current manual. The need to meet the current requirements shall be evaluated by a qualified person selected by the owner (user). Recommended changes shall be made by the owner (user) within one year.

12.4 INCONSISTENT STANDARDS

No inconsistencies between standards currently identified

12.5 HANFORD SPECIFIC REQUIREMENTS AND PRACTICES

CAUTION: Working on or under a suspended load is prohibited, except when the load can be supported by blocking or cribbing, can be securely braced, or can be supported substantially by some other means that would prevent the load from moving. Some loads being lifted and set in place may require special handling control measures such as inspecting, landing, setting, or controlling the load, that may require personnel to position their hands or other body parts under the load when no other method is feasible. These special handling control activities **MUST BE APPROVED** by management and industrial safety **PRIOR TO BEING PERFORMED**.

12.5.1 Lever Hoists

NOTE: *Wire rope ratchet and pawl lever-operated hoists are not recommended for use in lifting service at Hanford. If wire rope ratchet and pawl lever-operated hoists are used they shall comply with requirements of ASME B30.21.*

12.5.2 Load-Test Weight

The load-test weight should be within a tolerance of +0 %, -5 % and shall be traceable to a recognized standard or verified by calculations. Load tests shall never be less than minimum requirements defined in the applicable ASME Standard. Any one of the following options will meet this requirement:

1. Use a calibrated (+0 percent, -5 percent) load-measuring device during the load test.
2. Determine the test load with a calibrated load-measuring device before the test.
3. Calculate the test load based on known unit weights and dimensions of the test fixture. Dimensions and calculations shall be checked (signed and dated) by a qualified engineer and determined to be accurate within tolerance (+0 percent, -5 percent).

12.5.2.2 Load-Test Report

After the test is completed, the load-test report shall be signed and dated by the person in charge of conducting the load test. The person in charge shall ensure that the test is placed in the maintenance file.

12.5.3 Maintenance Files

The maintenance file is a compilation of various documents and records relating to operation, maintenance, inspection, testing, evaluation, and repair of the equipment. The file may be centrally located or proportioned into satellite holding areas. The methods selected for establishing adequate information retention and retrieval shall be determined by the equipment custodian, who is the responsible person for ensuring that a safe and reliable maintenance program is in place.

12.5.3.1 Intent of Maintenance Files

The maintenance file shall contain, as a minimum, the required current dated periodic inspection records and other documentation to provide the user with evidence of a safe and reliable maintenance program. Inspection records should be retained in a format and location that allows easy accessibility. Maintenance file information should provide a source for comparing existing and past conditions to determine whether existing conditions show a trending pattern of wear, deterioration, or other similar factors that may compromise safe, continued use of the equipment. Length of record retention shall be determined by the equipment custodian's established maintenance program.

12.5.3.2 Maintenance File Contents

Maintenance files shall contain the following documentation, as applicable:

1. Periodic inspection records
2. Load test reports
3. Documentation of altered, replaced, or repaired load-sustaining parts
4. Records of special inspections on safety-related items such as brakes, hooks, ropes, hydraulic/pneumatic cylinders, and hydraulic/pneumatic pressure relief valves
5. Copies of waivers, exemptions, hostile environment plans, or similar documentation applicable to the equipment (to include manufacturer's safety bulletins, safety alerts, and product recall information)
6. Documentation for replacement ropes (see Chapter 8.0, "Wire Rope")
7. Wire rope manufacturer's certification for replacement ropes

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