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11.0 BELOW-THE-HOOK LIFTING DEVICES

11.1 Scope

This Hanford Site Hoisting and Rigging (HSHRM) chapter provides requirements that apply to the marking, construction, installation, inspection, testing, maintenance, and operation of Below-the-Hook (BTH) Lifting Devices for attaching loads to various hoists. The proper and safe use of Below-the-Hook Lifting Devices is governed by the American Society of Mechanical Engineers (ASME) standards and the Occupational Safety and Health Administration (OSHA) regulations. This section implements required criteria the following standards:

- ASME B30.20, Below-the-Hook Lifting Devices
- ASME BTH-1, Design of Below-the-Hook Lifting Devices
- ANSI N14.6, Radioactive Materials – Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More
- OSHA 29 CFR 1926.251, Rigging Equipment for Material Handling

This chapter implements the following criteria and the applicable national standards and/or federal specifications that are mandatory per ASME B30.20, Below-the-Hook Lifting Devices, ASME BTH-1, Design of Below-the-Hook Lifting Devices, and ANSI N14.6, Radioactive Materials – Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More:

- ASME B30.20, Below-the-Hook Lifting Devices:
  - Chapter 20-0, Scope, Definitions, Personnel Competence, Translations and References
  - Chapter 20-1, Structural and Mechanical Lifting Devices
  - Chapter 20-2, Vacuum Lifting Devices
  - Chapter 20-3, Close Proximity Operated Lifting Magnets
  - Chapter 20-4, Remotely Operated Lifting Magnets
  - Chapter 20-5, Scrap and Material Handling Grapples

- Each ASME B30.20 chapter above includes the following sections:
  - Scope
  - Marking, Construction, and Installation
  - Inspection, Testing, and Maintenance
  - Operation
  - Instruction Manuals
11.0 – BELOW-THE-HOOK LIFTING DEVICES

• ASME BTH-1, Design of Below-the-Hook Lifting Devices:
  o Chapter 1, Scope, Definitions, and References
  o Chapter 2, Lifter Classifications
  o Chapter 3, Structural Design
  o Chapter 4, Mechanical Design
  o Chapter 5, Electrical Components

• ANSI N14.6, Radioactive Materials – Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More:
  o Scope
  o Normative References
  o Definitions
  o Design
  o Fabrication
  o Acceptance Testing, Maintenance, and Assurance of Continuing Compliance
  o Quality Assurance

11.2 Accessing Requirements

a. To access ASME standards, choose one of the following options:
   - IHS Engineering Standards, Regulations and Technical Specifications. The contractor must have paid for access to the specific standard.
   - Purchase standards directly from ASME.

b. To access OSHA standards, go to:
   - OSHA 29 CFR 1926.251, Rigging Equipment for Material Handling

11.3 Implementation

Contractors shall comply with OSHA, ASME, this HSHRM, and manufacturers’ requirements. User of this HSHRM are responsible to to implement all applicable requirements. If standards conflict, the user shall adhere to the standard containing the most stringent requirements. In most cases, ASME standards provide the most comprehensive information.

Users should contact a Hanford Hoisting Rigging Committee (HHRC) representative or send an email requesting a formal interpretation. See Appendix C, Interpretations, for the process to be followed. Notify the HHRC if any inconsistent standards are identified.

This HSHRM does not intend 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 HSHRM. The need to meet the current requirements shall be evaluated by a qualified person selected by the owner (user).

In accordance with design requirements, the responsible engineer may invoke ANSI N14.6, *Radioactive Materials – Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More*, to a below the-hook device. ANSI N14.6 invokes criteria similar to, but not identical to ASME B30.20, *Below-the-Hook Lifting Devices*, and ASME BTH-1, *Design of Below-the-Hook Lifting Devices*.

11.4 **Inconsistent Standards**

No inconsistencies between standards currently identified.

11.5 **Hanford Specific Requirements and Practices**

Below-the-hook lifting devices used at Hanford shall be tagged by any one of the following methods to indicate next periodic inspection due date.

a. Institute a comprehensive marking program (such as color coding) to indicate when the next inspection is required.

b. Mark each below-the-hook lifting device with a tag that indicates when the next periodic inspection is required.

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**Figure 11-1: Example Of A Load Test Tag**

![Load Test Tag Diagram]

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11.5.1 **Load Testing**

ASME B30.20, *Below-the-Hook Lifting Devices*, states load testing *should* be performed for below-the-hook lifting devices. All new, repaired or altered below-the-hook (BTH) lifting devices used at Hanford *shall* be load and operational tested to the provisions of ASME B30.20. The testing shall be documented as defined in ASME B30.20 and the BTH device tagged with the test date (for manufacturer load tested BTH devices use in-service date).

11.5.2 **Load-Test Weight**

The load-test weight or testing device should be within a tolerance of (+0 percent, -5 percent) and shall be traceable to a recognized standard or verified by engineering calculations. Load test
shall never be less than minimum requirements defined in the applicable ASME B30 standard. Any one of the following options will meet this requirement:

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

11.5.3 Load Test Tag

After the test is completed, the proof test (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 lifting device maintenance file. A tag indicating date of load test may be affixed to the device for filed verification.

Figure 11-2: Example Of A Periodic Inspection Tag