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## 13.0 OVERHEAD AND GANTRY CRANES

### 13.1 SCOPE

This chapter applies to the marking, construction, installation, inspection, testing, maintenance and operation of the following overhead and gantry cranes, including semi-gantry, cantilever gantry, wall cranes, bridge cranes, and others having the same fundamental characteristics. These cranes may be top-running, under-running, single- or double-girder. Hoist units and trolleys are most commonly electric powered, but can be air powered or hand-chain operated. These cranes may be cab operated, pulpit operated, floor operated, or remotely operated. Such cranes are grouped together because all have trolleys and similar travel characteristics.

The proper and safe use of overhead and gantry cranes 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 from DOE/RL-92-36 Hanford Site Hoisting and Rigging Manual and the following standards:

- ASME B30.2-2005 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist)
- ASME B30.17-2006 Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
- OSHA 29 CFR 1910.179 - Overhead and Gantry Cranes
- OSHA 29 CFR 1926 Subpart CC Overhead and Gantry Cranes (only applies to temporarily installed cranes)

The responsible engineer may invoke Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder) ASME NOG-1-2004 for crane used at nuclear facilities. ASME NOG-1 applies to the design, manufacture, testing, inspection, shipment, storage, and erection of overhead and gantry cranes (Top Running Bridge, Multiple Girder).

The responsible engineer may invoke Rules for Construction of Cranes, Monorails, and Hoists (with Bridge or Trolley or Hoist of the Underhung Type) ASME NUM-1-2004 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 or Trolley or Hoist of the Underhung Type).

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

- ASME B30.2-2005 Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist),
  - General Construction and Installation, Chapter 2-1
  - Inspection, Testing, and Maintenance, Chapter 2-2
  - Operation, Chapter 2-3
- ASME B30.17-2006 Overhead and Gantry Cranes (Top Running Bridge, Single Girder, Underhung Hoist)
  - General Construction and Installation, Chapter 17-1
  - Inspection, Testing, and Maintenance, Chapter 17-2
  - Operation, Chapter 17-3

### 13.2 GENERAL REQUIREMENTS

Contractors shall access requirements via 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. To purchase standards directly from ASME go to <http://www.asme.org>
3. To access OSHA 29 CFR 1910.179, *Overhead and Gantry Cranes*, go to the following link
  - [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=9830](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9830)
4. To access OSHA 29 CFR 1926, Subpart CC, refer to either of the following
  - Chapter 19, *OSHA 29 CFR 1926, Subpart CC*
  - <http://www.osha.gov/doc/cranesreg.pdf>

### 13.3 IMPLEMENTATION

Contractors shall be compliant to OSHA, ASME, DOE/RL-92-36, and the overhead or gantry crane 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 Site Hoisting and Rigging Committee (HHRC) representative or send an email to ^Hanford Hoisting and Rigging for a formal interpretation. See Chapter 17.0 for process to be followed when requesting an interpretation. Notify the Hanford Site Hoisting and Rigging Committee (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 1 year.

### 13.4 INCONSISTENT STANDARDS

No inconsistencies between standards currently identified

### 13.5 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**.

#### 13.5.1 Load-Test Weight.

The load-test weight should be within a tolerance of +0 percent, -5 percent and shall be traceable to a recognized standard or verified by engineering calculations. Any one of the following options will meet this requirement:

- Use a calibrated (+0 percent, -5 percent) 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 have been checked (signed and dated) by a qualified engineer and determined to be accurate within tolerance (+0 percent, -5 percent)

### **13.5.2 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 crane maintenance file.

### **13.5.3 Crane Maintenance Files**

The crane 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.

The crane 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 provides for ease in accessibility. Maintenance file information should provide a source for comparing present conditions with past conditions to determine whether existing conditions show a trending pattern of wear, deterioration, or other comparable 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.

See Attachment 13.1 on the next page for a Sample Overhead Crane Daily Inspection Checklist

## ATTACHMENT 13.1 - SAMPLE OVERHEAD CRANES DAILY INSPECTION CHECKLIST

BLDG: \_\_\_\_\_ LOCATION: \_\_\_\_\_ CRANE #: \_\_\_\_\_ DATE: / / BY: \_\_\_\_\_

COMPONENT	N/A	OK	FAULTY	COMMENTS
Main Hoist				
Controls				
Push Buttons				
Sounds Normal				
Movement Smooth				
Brakes Positive				
Upper Limit				
Lower Limit				
Upper and Lower Blocks				
Sheaves				
Rope and Connections				
Proper Drum Spooling				
Hooks				
Auxiliary Hoist				
Controls				
Pushbuttons				
Sounds Normal				
Movement Smooth				
Brakes Positive				
Upper Limit				
Lower Limit				
Upper and Lower Blocks				
Sheaves				
Rope and Connections				
Proper Drum Spooling				
Hooks				
Trolley				
Controls/Pushbutton				
Travels Smooth				
Sounds Normal				
Brakes Positive				
Trolley and Bridge Obstruction				
Housekeeping				
Ladders and Landings				
Oil Leaks				
Operation of Brakes				
Loose Parts				
Keepers in Place				
Lubrication Requirements				
Fire Extinguisher Locations				
Retaining Latch(es) in Place				
Hooks Swivel Freely				
Obvious Hook Deformations				
Bridge				
Controls/Pushbuttons				
Travels Smooth				
Sounds Normal				
Brakes Positive				
Limits Working				
Alarms				
Lights				
Rigging Capacity				