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## 1-6 HOISTING AND RIGGING IN HOSTILE ENVIRONMENTS

### 1-6.1 Scope

#### 1-6.1.1 Normal Operations

Hoisting and rigging (H&R) activities can usually be accomplished where the environment will allow normal operations with access for hands-on equipment contact. In such situations, operations, maintenance, inspections, and tests shall be done in accordance with regular provisions of this Hanford Site Hoisting and Rigging Manual (HSHRM).

#### 1-6.1.2 Special Provisions

This HSHRM chapter contains the special provisions for H&R operations and equipment in hostile environments where standard operating, maintenance, inspection, or test procedures cannot be followed as a result of radiation or contamination, toxic/hazardous chemicals or gasses, or temperature extremes.

### 1-6.2 Equipment and Operations Review

#### 1-6.2.1 Prerequisite Review

The H&R equipment or operations shall be reviewed by a designated person to determine compliance with the requirements of this HSHRM. If it is determined to be impossible or unreasonable for the requirements of this HSHRM to be met as a result of hostile environmental conditions, then a hostile environment plan shall be prepared to document alternative compliance methods and procedures.

#### 1-6.2.2 As Low As Reasonably Achievable

All H&R operations shall be consistent with the U.S. Department of Energy's radiation exposure policy of "as low as reasonably achievable" (ALARA).

#### 1-6.2.3 First Priority

Safety of personnel shall remain the first priority.

### 1-6.3 Hostile Environment Plan

#### 1-6.3.1 Preparation

A hostile environment plan shall be prepared by a designated person and shall cover operations, equipment, inspection, testing, and maintenance. See Attachment 1, *Hostile Environment Plan*.

#### 1-6.3.2 Review/Approval Requirements

As a minimum, the plan shall be reviewed and approved (signed and dated) by responsible management at the facility where the crane/hoist or other equipment is located and responsible management of an overview organization (such as Safety or Quality Assurance). Depending upon the site-specific organizational structure, the following review/approvals are recommended:

1. \*Facility manager
2. \*Responsible management, oversight organization (safety or quality assurance/control)
3. Responsible operations manager
4. Equipment custodian
5. Cognizant engineer

*\*Review/approval is mandatory.*

### **1-6.3.3 Hostile Environment Plan Contents**

The plan shall address only those actions or features that require deviation from the requirements of this HSHRM because of a hostile environment, but shall contain the following information as a minimum:

1. The specific requirement(s) that are not in compliance.
2. The difference between the requirement and actual conditions.
3. Justification for not meeting this HSHRM's requirements.
4. A statement of actions or features to be used to compensate for the differences.
5. Specific maintenance, inspections, and tests to be performed whenever access is possible.
6. Replacement or retirement criteria for equipment that is designed to operate with minimum or no maintenance.

### **1-6.3.4 Additional Procedures**

Detailed operation, inspection, testing, and maintenance procedures that state specific requirements and acceptance criteria shall be prepared based upon the hostile environment plan.

### **1-6.3.5 Hostile Environment Plan Distribution**

The facility manager shall ensure that the approved hostile environment plan is distributed as follows:

1. U.S. Department of Energy, Richland Operations Office Hoisting and Rigging Program Manager, MSIN R3-78 (for information)
2. Equipment operators, maintenance organizations, and other organizations/personnel affected by the plan
3. Equipment history file

**NOTE:** *Hostile environment plans in the equipment history file shall be readily available to appointed personnel.*

#### **1-6.4 Marking and Posting**

Equipment that requires a hostile environment plan should be posted “Hostile Environment Plan-Special Maintenance and Operating Instructions.”

#### **1-6.5 Inspection and Material Limitations**

##### **1-6.5.1 Hardware**

Handling fixtures, rigging, and rigging accessories shall be marked, tagged, load tested, and otherwise qualified, as appropriate, in accordance with this HSHRM before being exposed to the hostile environment.

##### **1-6.5.2 Synthetic Fiber Slings**

Synthetic fiber slings, including Kevlar,<sup>1</sup> K-Spec,<sup>2</sup> nylon, and polyester may be used in radiation areas only when the responsible person ensures that the absorbed dose shall not exceed 100,000 rads during the life of the sling.

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<sup>1</sup> *Kevlar is a registered trademark of DuPont de Nemours.*

<sup>2</sup> *K-Spec is a registered trademark of SlingMax.*

Attachment 1: Typical Hostile Environment Plan

Building: \_\_\_\_\_ Location: \_\_\_\_\_

Type crane/hoist: \_\_\_\_\_ (e.g., overhead top-running bridge and trolley; top-running bridge with underhung hoist; jib crane; monorail hoist; overhead hoist)

Capacity (main and auxiliary): \_\_\_\_\_

Power method: \_\_\_\_\_ (e.g., hand operated, electrical powered)

Manufacturer: \_\_\_\_\_

1.a. Paragraph number of the Hanford Site Hoisting and Rigging Manual (HSHRM) requirement that will not be met: \_\_\_\_\_

(Copy the applicable paragraph)

1.b. Difference between HSHRM requirement and what is to be allowed by this plan:

\_\_\_\_\_  
\_\_\_\_\_

1.c. Justification for not meeting the HSHRM requirement:

\_\_\_\_\_  
\_\_\_\_\_

1.d. Actions or features to compensate for differences:

\_\_\_\_\_  
\_\_\_\_\_

Include information regarding replacement or retirement criteria for this equipment. Also include information regarding any special design, maintenance, or test considerations that apply to this equipment.

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

[ADD ADDITIONAL SECTIONS TO THIS PLAN AS REQUIRED. (e.g., 2.a THROUGH 2.d).]

APPROVALS

Facility Manager \_\_\_\_\_ Manager, Oversight Organization: \_\_\_\_\_  
(signature/date) (signature/date)

- Other: \_\_\_\_\_  
(signature/date)

\* Modify approval cycle; see Section 1-6.3.2  
Place approved Hostile Environment Plan in Equipment History File  
Make readily available to operating and maintenance personnel