

DEFINITION OF DESIGN REQUIREMENTS

1.0 Objective

The objective of this surveillance is to evaluate the effectiveness of the laboratory's program to establish comprehensive design requirements for modifications or new installations before detailed design work commences. The Facility Representative or Environmental, Safety, and Health Support Specialist verifies that appropriate design requirements have been established and that the laboratory is complying with applicable DOE requirements.

2.0 References

- 2.1 DOE 4700.1, *Project Management System*
- 2.2 DOE 5700.6C, *Quality Assurance*
- 2.3 DOE 6430.1A, *General Design Criteria*
- 2.4 10 CFR 830.120, *Quality Assurance Requirements for DOE Nuclear Facilities*

3.0 Surveillance Activities

During this surveillance, the Facility Representative or Environmental, Safety, and Health Support Specialist selects three modification or design packages for review. The packages should involve modification or construction of systems, structure, and components that are important to the safety and health of the public or DOE's workers. The selected packages should be approved and released for fabrication or construction. The following are general review questions covering a very broad range of activities. The Facility Representative or Environmental, Safety, and Health Support Specialist should also evaluate the design requirements in the design package against specific requirements contained in DOE 6430.1A.

**Surveillance Guideline
 DEFINITION OF DESIGN REQUIREMENTS**

Surveillance No.: _____

Facility: _____

Date Completed: _____

	<u>YES</u>	<u>NO</u>	<u>N/A</u>
1. Does the design package specify the safety class of systems, structures, and components?	_____	_____	_____
2. Are system, structure, and component performance requirements defined?	_____	_____	_____
3. Are the specified performance requirements consistent with the initial engineering work request or other documents that initiated the design effort?	_____	_____	_____
4. Do design requirements specify the normal operating environments for systems, structures, and components?	_____	_____	_____
a. Temperatures?	_____	_____	_____
b. Pressure?	_____	_____	_____
c. Humidity?	_____	_____	_____
d. Radiation Levels?	_____	_____	_____
5. Do design requirements specify post-accident operating environments in which equipment would have to function?	_____	_____	_____
a. Temperatures?	_____	_____	_____
b. Pressure?	_____	_____	_____
c. Humidity?	_____	_____	_____
d. Radiation Levels?	_____	_____	_____
6. Do the design requirements address natural phenomena hazards that may affect system, structure, and component performance?	_____	_____	_____
a. Floods?	_____	_____	_____
b. Winds?	_____	_____	_____
c. Earthquakes?	_____	_____	_____
d. Tornados?	_____	_____	_____

Surveillance Guideline
DEFINITION OF DESIGN REQUIREMENTS (cont.)

		<u>YES</u>	<u>NO</u>	<u>N/A</u>
7.	Do the design requirements address requirements for maintenance?	_____	_____	_____
a.	Clearances for equipment removal and maintenance?	_____	_____	_____
b.	Laydown space for maintenance?	_____	_____	_____
c.	Provisions for equipment removal?	_____	_____	_____
d.	Hoists, cranes, trolleys, or lifts for manipulating equipment?	_____	_____	_____
e.	Ladders, platforms, scaffolds, or other provisions for maintenance access?	_____	_____	_____
f.	Drains, vents, or isolation valves for removing equipment from service?	_____	_____	_____
8.	Do the design requirements provide for ensuring that radiation doses to workers are As Low As Reasonably Achievable (ALARA) during operations?	_____	_____	_____
a.	Is adequate shielding provided?	_____	_____	_____
b.	Were radiation doses considered in establishing locations for instruments and controls?	_____	_____	_____
c.	Do design requirements minimize traps for radioactive fluids, particles, or materials?	_____	_____	_____
d.	Are potential leakage points for radioactive fluids located well away from accessible areas?	_____	_____	_____
e.	Have provisions been made to collect potentially radioactive leakage?	_____	_____	_____
9.	Do the design requirements provide adequate consideration of fire protection for the facility?	_____	_____	_____
a.	Have provisions been made for sprinklers or other fire suppression systems?	_____	_____	_____
b.	Has the fire loading for the new design or modification been included in the facility fire hazard analysis?	_____	_____	_____
c.	Has consideration been given to relocation of fire detection instruments?	_____	_____	_____
10.	Do the design requirements adequately treat electrical design considerations?	_____	_____	_____
a.	Have adequate provisions been made for the electrical loads?	_____	_____	_____

Surveillance Guideline
DEFINITION OF DESIGN REQUIREMENTS (cont.)

		<u>YES</u>	<u>NO</u>	<u>N/A</u>
	b. Have provisions been made to load appropriate components on emergency safeguard feature power supplies?	_____	_____	_____
	c. Have adequate electrical protective features been included in the design?	_____	_____	_____
11.	Have appropriate human factors design requirements been established?	_____	_____	_____
	a. Instruments and controls are readable?	_____	_____	_____
	b. Instruments and controls are readily accessible?	_____	_____	_____
	c. Controls facilitate prompt emergency response by operators?	_____	_____	_____
	d. Is adequate lighting available to support operations?	_____	_____	_____
12.	Have appropriate design requirements been established to protect worker safety and health?	_____	_____	_____
	a. Rotating machinery has appropriate guards?	_____	_____	_____
	b. Ambient noise levels are controlled to protect hearing?	_____	_____	_____
	c. Walking and working surfaces minimize the potential for slips and falls?	_____	_____	_____
	d. Electrical equipment is installed in sealed cabinets?	_____	_____	_____
	e. The potential for hazardous chemicals and toxic materials to be released into the work area has been minimized?	_____	_____	_____
	f. Are railings and barriers installed as necessary to protect personnel?	_____	_____	_____
OTHER:				
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____
	_____	_____	_____	_____

DEFINITION OF DESIGN REQUIREMENTS (cont.)

YES

NO

N/A

OTHER (cont.)

NOTES/COMMENTS:

PERSONNEL CONTACTED:

DESIGN CHANGE PACKAGES REVIEWED:

DEFINITION OF DESIGN REQUIREMENTS (cont.)

**IF MORE SPACE IS NEEDED FOR FINDINGS, OBSERVATIONS, AND FOLLOWUP
ITEMS - USE ADDITIONAL SHEETS**

FINDINGS:

Finding No.: _____

Description: _____

Finding No.: _____

Description: _____

Finding No.: _____

Description: _____

Surveillance Guideline
DEFINITION OF DESIGN REQUIREMENTS (cont.)

OBSERVATIONS:

Observation No.: _____

Description: _____

Observation No.: _____

Description: _____

Observation No.: _____

Description: _____

Surveillance Guideline
DEFINITION OF DESIGN REQUIREMENTS (cont.)

FOLLOWUP ITEMS:

Followup Item No.: _____

Description: _____

Followup Item No.: _____

Description: _____

Followup Item No.: _____

Description: _____

Surveillance Guideline
DEFINITION OF DESIGN REQUIREMENTS (cont.)

LABORATORY MANAGEMENT DEBRIEFED AND RESULTS: _____

Signature: _____ Date: _____

Facility Representative or
Environmental, Safety, and Health Support Specialist