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: _____

		YES	NO	N/A
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.)

		YES	NO	N/A
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.)

		YES	NO	N/A
	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