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STANDARDS/REQUIREMENTS IDENTIFICATION DOCUMENT

FUNCTIONAL AREA 11.0

RADIATION PROTECTION (U)

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Manager, Contractor Assurance

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Date

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11.00 RADIATION PROTECTION

Standards/Requirements Identification Document (S/RID) Functional Area 00, S/RID Purpose and Development, contains general information on the development (including the type of source documents considered), assessment, approval, and maintenance of the SRR S/RID which is pertinent to the understanding of this functional area S/RID. The reader should refer to S/RID FA 00 for a complete understanding of this functional area S/RID.

This document addresses the Environmental, Safety, and Health (ES&H) requirements related to radiation protection activities undertaken by SRR on behalf of the Department of Energy (DOE) at the Savannah River Site (SRS). The sources for requirements included in this functional area are 10 CFR 835, DOE Standards, DOE Orders related to radiation protection, and various ANSI standards. The Radiation Protection functional area is prepared in alignment with the Revision 0, July 30, 1993 version of the DOE-HQ ES&H Configuration Guide, with the following qualification.

Portions of the ES&H Configuration Guide for this functional area specify inclusion of requirements that were considered by SRR as more appropriate for inclusion in other S/RID functional areas. Rather than repeating requirements in multiple functional areas, reference is made to the S/RID functional areas that contain requirements associated with the Radiation Protection functional area. Requirements such as the use of a particular code, standard or process which are derived from ANSI standards are also included in this document.

The scope of the Radiation Protection (RP) Functional Area includes the requirements for the development of an effective RP Program. Radiation protection of personnel and the public is accomplished by establishing and implementing a program which includes requirements for the management and handling of radioactive materials, processes and areas. Verification of the effectiveness of these requirements is established through a network of monitoring and sampling of personnel, the workplace, and the adjacent environment. Record management requirements are applied to demonstrate compliance with regulations and to establish personnel exposure trends and histories, as well as to respond to reporting requirements.

The Functional Area elements are discussed in Sections 11.01 through 11.09. Key interfaces with other functional areas are discussed in Section 11.10.

11.01 MANAGEMENT

The Management Element of this Functional Area addresses those general elements which are required for the Radiation Protection (RP) Program. The elements specific to an RP Program include requirements for the training of personnel and the implementation of an As Low As Reasonably Achievable (ALARA) program.

11.01.01 Exposure Reduction and ALARA

ALARA is an approach to radiation protection intended to manage and control exposures (both individual and collective to the work force and to the general public) at levels as low as social, technical, economic, practical, and public-policy considerations permit. ALARA is a principle which has the objective of attaining doses as far below applicable regulatory limits as is reasonably achievable and is the premise on which DOE bases its RP Policy. The principles of ALARA should be applied to all activities involving potential occupational exposure to radiation and radioactive materials.

11.01.02 Radiation Protection Training

This element addresses requirements for the training of the general worker population. RP Training makes the general worker aware of the hazards of radiation and addresses the responsibility of each individual to demonstrate a disciplined and cautious attitude toward radiation and radioactive materials.

Requirements are specified for training of radiological workers in the handling of radioactive materials and processes, use of RP controls and features, and recognition of abnormal situations.

11.02 MONITORING AND SURVEYS

The RP Functional Area contains requirements for the installation, testing and maintenance of both fixed and portable monitoring and alarm systems, personnel monitoring and area surveys.

Requirements are included to specify the organizations responsible for the maintenance and testing of all radiation monitoring systems.

11.02.01 Radiation Monitors, Alarms and Radiation and Contamination Surveys

This element includes requirements for fixed and portable monitoring and alarm systems to measure radiation levels in those occupied areas with potential for sudden and/or unexpected increases in radiation and in areas with radiation levels above normal background.

Requirements included in this element are for monitors used in interlock systems which prevent entry into very high radiation areas during operation of radiation producing devices or processes. Requirements which are to ensure that fail-safe mechanisms are employed, e.g., upon monitor failure, entry is prohibited or the radiation producing device or process is disabled, are also included in this element of this S/RID functional area.

Requirements for area dose rate surveys, including the periodic assessment of radiation levels in areas not serviced by fixed monitoring systems, utilizing portable equipment, are included. Requirements for contamination surveys for both total and removable radioactive material are also included.

11.02.02 Airborne Radioactivity Monitors, Alarms and Surveys

This element addresses requirements for monitors, alarms and surveys to assess airborne radioactivity similar to requirements established for radiation level monitoring and surveys.

11.03 PERSONNEL EXPOSURE MONITORING

The primary objective of the RP Functional Area is the measurement of personnel exposure to radiation through the effective use of personnel monitoring. The RP Functional Area addresses requirements for compliance with regulatory and administrative limits, verification of the effectiveness of personnel monitoring and the identification of deficiencies through monitoring of personnel.

11.03.01 Personnel Monitoring

This element includes requirements for external and internal monitoring and requirements which ensure proper issue, use, collection and verification of monitoring devices and that documentation of monitoring data is prepared and maintained.

The requirements contained in this element define the areas and/or situations where dosimetry and/or bioassay are required and identify the appropriate types and numbers of dosimeters to be worn considering the energies and types of radiation present.

11.03.02 Exposure Limits

This element identifies requirements for personnel exposure limits, including exposure limits set for administrative control including lifetime limits for radiation workers, embryo/fetus, members of the public, and minors.

Requirements for annual dose limits for radiation workers for the whole body, lens of the eye, extremities, any organ or tissue (other than lens of eye or skin) and the embryo/fetus of a declared pregnant worker are also included in this element of this S/RID functional area.

11.03.03 Dosimetry Program

Requirements for a dosimetry program accredited by the DOE Laboratory Accreditation Program (DOELAP) are included in this element of this S/RID functional area.

11.03.04 Calculation Methods and Models

This element identifies requirements for analysis and interpretation of internal and external monitoring results. The requirements address the formulation of dose assessments, including the use and verification of methods used to convert dosimetry results to total effective dose equivalent.

11.04 RADIATION AREA ACCESS CONTROL

Requirements that control access to radiation areas based on the radiation level category of the area are identified. Categories include radiation, high-radiation and very high-radiation areas.

11.04.01 Access Restrictions and Posting

This element includes requirements which ensure that access to radiological areas is appropriately restricted. Topics which should be addressed include personnel dosimetry, appropriately signed Radiological Work Permits (RWPs), survey instrument or dose rate indicating device, a pre-work briefing, and posting of entry and exit points.

11.04.02 Radiological Work Permits

Requirements address administrative mechanisms such as Radiological Work Permits (RWPs) to control work activities within radiological areas. Use of RWPs ensure that personnel are aware of the job description, radiation conditions, entry requirements and any limiting conditions for task performance. RWPs provide a means of relating and tracking worker exposure history to work activities through unique RWP numbers, identification of the worker(s) and RWP issue and expiration dates.

11.05 RADIOACTIVE MATERIALS MANAGEMENT

The requirements included in the RP Functional Area are for management of radioactive materials to preclude the unnecessary exposure of personnel and the spread of contamination. Radioactive material is any material,

equipment or system component determined to be contaminated or suspected of being contaminated. Items located in known or suspected contamination, high contamination or airborne radioactivity areas and having the potential to become contaminated are considered radioactive material.

Requirements are specified for the control of sealed and unsealed sources, and radioactive gases and liquids.

11.05.01 Storage, Labels and Transportation

The Packaging and Transportation Functional Area of the S/RID addresses the requirements, including packaging and labeling, which apply to the handling of radioactive materials during packaging and transportation.

This element includes requirements for source containment procedures, including the receipt, inventory, labeling, storage, transfer and disposal of sealed and unsealed sources and for integrity testing of sealed sources. The procedures also provide for accountability of sources including approval authority for any sources brought onto the site.

Requirements for storing radioactive materials are specified to ensure that materials are placed in controlled areas in conditions compatible with the materials and packaging.

11.05.02 Movement of Material

Requirements for the movement of radioactive materials to controlled and uncontrolled areas are addressed. These requirements are included to prevent recontamination of the materials between the time of the administrative release and the actual movement.

11.05.03 Specific Nuclide Control

No requirements have been identified in this element.

11.06 CONTAMINATION CONTROL

The RP Functional Area contains requirements to minimize contamination of radiological areas, thus protecting personnel who enter those areas from contamination and reducing the probability that radioactive contaminants will be released to the environment.

The RP Functional Area includes requirements for the development and implementation of engineering requirements such as containment barriers and ventilation for reducing exposures due to contamination.

Requirements which specify the limit of fixed and removable contamination on materials and equipment to be released from radiological areas are included.

11.06.01 Personnel, Equipment and Area Contamination Control

This element identifies requirements for procedures to protect personnel from contamination, including the use of respirators.

This element also includes the requirements for removal or in-place fixation of contamination on surfaces, and for removing contaminated equipment from service.

11.06.02 Personnel, Equipment and Area Decontamination

No requirements have been identified in this element.

11.07 LABORATORY ANALYSIS

No requirements have been identified in this element.

11.08 RADIATION PROTECTION EQUIPMENT AND SUPPLIES

Control and maintenance of RP equipment and supplies requirements are addressed to establish and ensure the availability, accuracy, reliability and correct routine and emergency use. Requirements for equipment used for monitoring radiation exposures and exposure rates are to ensure meeting defined technical standards for accuracy, sensitivity, angular dependence, and radiation type.

11.08.01 Monitoring and Survey Instrumentation

Requirements which specify technical aspects of monitoring and survey instrumentation including dosimeters are included in this element. Requirements provide information for the specification of periodic calibration and functional testing of instrumentation including labeling and tagging, calibration records, maintenance requirements, and response in the event that as-found readings indicate instrumentation miscalibration.

11.08.02 Respiratory Equipment and Supplies

No requirements have been identified in this element.

11.08.03 Protective Clothing

This element identifies requirements for the supply, use, cleaning, inspection, storage and surveying of protective clothing.

11.09 RADIATION PROTECTION OF THE PUBLIC AND ENVIRONMENT

The DOE has established dose limits for members of the general public, and in addition has adopted the ALARA principle to keep exposures as low as reasonably achievable below the statutory limits. Minimizing the release of radioactive materials to the environment is the primary means of ensuring that the public is protected from unnecessary exposure to radiation. This element of the RP Functional Area contains requirements applicable to radiation protection of the public and minimization of radioactive releases to the air, soil or water. See Environmental Protection Functional Area.

11.09.01 Dose Limits

No requirements have been identified in this element.

11.09.02 Liquid Waste Discharges

No requirements have been identified in this element.

11.09.03 Solid Waste Disposal

No requirements have been identified in this element.

11.09.04 Demonstration of Compliance

This element is also a part of Environmental Protection S/RID functional area, which contains all necessary and sufficient requirements for the monitoring and surveillance of all radioactive effluents.

11.10 KEY INTERFACES

To the extent practicable, all S/RID functional areas which consider their potential interface to Radiation Protection to ensure that plans and activities are reviewed based on the ALARA principle, and that potential releases to the environment are considered when radioactive materials are handled. Specific interface areas which have been identified are listed below.

11.10.01 Management Systems

The Management Systems S/RID functional area identifies requirements for independent oversight of the Radiation Protection Program. Refer to the Management Systems S/RID functional area.

11.10.02 Quality Assurance

An interface to the Quality Assurance S/RID functional area is needed to ensure that all requirements for the radiation protection of the workers and the general public and all reporting requirements are properly incorporated into operations. Refer to the Quality Assurance S/RID functional area for the specification of such requirements. QA related requirements from 10 CFR 830.120 are identified in the QA S/RID functional area and related to specific aspects of the Radiation Protection Program.

11.10.03 Configuration Management

Activities in the Configuration Management S/RID functional area must interface to the RP S/RID functional area to ensure that current radiation protection systems are not compromised by modifications, and that new activities receive the proper review when new systems are needed. Refer to the Configuration Management S/RID functional area for the application of such requirements to the Radiation Protection Program at SRS.

11.10.04 Training and Qualifications

This S/RID functional area (Radiation Protection) addresses training requirements very specific to the Radiation Protection Program at SRS. However, general training requirements are addressed in the Training and Qualifications S/RID functional area. Therefore, an interface to the Training and Qualifications S/RID functional area is necessary to ensure that the specific RP training requirements are included in the worker training profiles.

11.10.05 Emergency Planning

Because of the potential for emergency situations involving radioactive material and potential exposure of emergency response personnel, an interface to Emergency Preparedness is required. Refer to the Emergency Preparedness S/RID functional area for specific requirements for managing emergencies.

11.10.06 Engineering Program

The Engineering Program is to ensure that an ALARA interface is defined and established for the routine review of new construction and modifications. This S/RID functional area has identified very specific requirements for shielding. However, refer to Engineering Program S/RID functional area for the specification of general design and construction requirements.

11.10.07 Operations

An interface to the Operations S/RID functional area is needed to ensure that radiation protection and the ALARA principle are incorporated into daily operations. The Management Element of this S/RID functional area addresses necessary and sufficient requirements for achieving ALARA objectives. Requirements in the Operations S/RID functional area provide general provisions on the Operations that can impact those objectives.

11.10.08 Maintenance

An interface with the Maintenance S/RID functional area is needed because the monitoring systems used for radiation protection must have a maintenance plan, and because other areas of maintenance must be aware of potential radiation hazards. Refer to the Maintenance S/RID functional area for the specific requirements.

11.10.09 Packaging and Transportation

Requirements for packing and transportation before shipment are addressed in this S/RID functional area. However, DOT and SCDHEC requirements for the Packaging and Transportation of radioactive material are addressed in the Packaging and Transportation S/RID functional area. Refer to the Packaging and Transportation S/RID functional area for the specific requirements.

11.10.10 Research and Development and Experimental Activities

The Research and Development S/RID functional area has no requirement identified.

11.10.11 Nuclear Safety

Because the Nuclear and Process Safety S/RID functional area encompasses the operation of nuclear facilities from design through decommissioning, refer to the Nuclear and Process Safety S/RID functional area for the specific requirements.

11.10.12 Environmental Protection

Requirements for release of radioactive materials to the environment are addressed in the Environmental Protection S/RID functional area. For specific release limit and discharges of radioactivity to the environment, refer to the EP S/RID functional area.

11.11 DOCUMENTS

11.11.01 Reference Documents

10 CFR 835	OCCUPATIONAL RADIATION PROTECTION
ANSI N323A - 1997	AMERICAN NATIONAL STANDARD: RADIATION PROTECTION INSTRUMENTATION TEST AND CALIBRATION, PORTABLE SURVEY INSTRUMENTS, 12/31/1997
ANSI N42.18 - 1980	AMERICAN NATIONAL STANDARD: SPECIFICATION AND PERFORMANCE OF ON-SITE INSTRUMENTATION FOR CONTINUOUSLY MONITORING RADIOACTIVITY IN EFFLUENTS, 8/15/1980
ANSI N43.3 - 1993	AMERICAN NATIONAL STANDARD FOR GENERAL RADIATION SAFETY - INSTALLATIONS USING NON-MEDICAL X-RAY AND SEALED GAMMA-RAY SOURCES, ENERGIES UP TO 10 MEV, 1/28/1993
ANSI/HPS N43.2 - 2001	AMERICAN NATIONAL STANDARD: RADIATION SAFETY FOR X-RAY DIFFRACTION AND FLUORESCENCE ANALYSIS EQUIPMENT, 7/31/2001
DOEO231.1B_AChg1	ENVIRONMENT, SAFETY AND HEALTH REPORTING ADMIN CHANGE 1, 11/28/2012
DOE-STD-1098-99	RADIOLOGICAL CONTROL, 7/1/1999

TABLE 1 FORMAT AND CONTENT

S/RID Requirement Number	Unique number for each requirement that links the statement to the ES&H Configuration Guide
Source Document	Number of the source document
Source Document Requirement Number	Unique reference from the source document.
Requirement Text	Requirement statement

Facility Categories *

Requirement applicability is shown in relation to the following facility categories:

Nuclear HC-1,2,3	Representing nuclear hazard category 1, 2 and 3 facilities (as defined by DOE Standard 1027-92) and includes any facility(s) required to support a nuclear facility(s).
Radiological	Representing facilities below Hazard Category 3 but still contain quantities of radioactive material at or above the Reportable Quantity value listed in 40 CFR 302.4.
High Hazard Chemical	Representing facilities with radiological hazards below 40 CFR 302.4 thresholds for radiological materials, but with any chemical hazard at or above threshold quantities listed in 29 CFR 1910.119 or 40 CFR 68. These facilities may also contain nuclear materials exempt from the nuclear facility definition, e.g., check and calibration sources, radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and x-ray machines, as defined by 10 CFR 830.3.
Low Hazard Chemical	Representing facilities with radiological hazards below 40 CFR 302.4 thresholds, but with chemical hazards both below 29 CFR 1910.119 or 40 CFR 68 thresholds and at or above reportable quantities in 40 CFR 302.4. These facilities may also contain nuclear materials exempt from the nuclear facility definition, e.g., check and calibration sources, radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and x-ray machines, as defined by 10 CFR 830.3.
Other Industrial	Representing facilities with all radiological and chemical hazards below 40 CFR 302.4 thresholds. These facilities may also contain nuclear materials exempt from the nuclear facility definition, e.g., check and calibration sources, radioactive sources in research and experimental and analytical laboratory activities, electron microscopes, and x-ray machines, as defined by 10 CFR 830.3.
Facility Specific	These are requirements that are applicable to specific facilities. Facility identification is included in this column, when applicable.

Phase I Compliance Approach

Common	Implementation of these requirements is covered by common procedures and policies.
Facility Specific	Implementation of these requirements is covered by facility specific procedures.

* Refer to the “SRR Facilities List” contained in Functional Area 00 for the category for specific SRS facilities/ bldgs.

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.01.01.055	ANSI N43.3 - 1993	9.3.1.3 (i)	All radiation sources and radiation protection equipment shall be checked for proper operation each day prior to use.	X	X	X	X	X		X	
11.01.01.056	ANSI N43.3 - 1993	9.3.1.3 (ii)	A check-list shall be completed prior to each day's operation of the equipment. The check-list shall include radiation producing equipment, interlocks, warning devices, and emergency stop switches.	X	X	X	X	X		X	
11.01.01.058	ANSI N43.3 - 1993	9.3.1.4	The operator shall perform a visual check of the controlled area to assure it is free of all unauthorized personnel immediately prior to activating or exposing the radiation source. The operator shall be the last person to exit the area.	X	X	X	X	X		X	
11.01.01.059	ANSI N43.3 - 1993	9.3.3.1.2	All radiation sources and radiation protection equipment shall be inspected each day prior to use. A check-list shall be completed prior to each day's operation of the equipment. The checklist shall cover radiation producing equipment, warning devices, and emergency stop switches.	X	X	X	X	X		X	
11.01.01.313	10 CFR 835	Sub.A.835.1(a)	(a) General. The rules in this part establish radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities.	X	X	X	X	X		X	
11.01.01.314	10 CFR 835	Sub.A.835.1(b)	(b) Exclusion. Except as provided in paragraph (c) of this section, the requirements in this part do not apply to: (1) Activities that are regulated through a license by the Nuclear Regulatory Commission or a State under an Agreement with the Nuclear Regulatory Commission, including activities certified by the Nuclear Regulatory Commission under section 1701 of the Atomic Energy Act; (2) Activities conducted under the authority of the Deputy Administrator for Naval Reactors, as described in Pub. L. 98-525 and 106-65; (3) Activities conducted under the Nuclear Explosives and Weapons Surety Program relating to the prevention of accidental or unauthorized nuclear detonations. (4) DOE activities conducted outside the United States on territory under the jurisdiction of a foreign government to the extent governed by occupational radiation protection requirements agreed to between the United States and the cognizant government; (5) Background radiation, radiation doses received as a patient for the purposes of medical diagnosis or therapy, or radiation doses received from participation as a subject in medical research programs; or (6) Radioactive material on or within material, equipment, and real property which is approved for release when the radiological conditions of the material, equipment, and real property have been documented to comply with the criteria for release set forth in a DOE authorized limit which has been approved by a Secretarial Officer in consultation with the Chief Health, Safety and Security Officer. (7) Radioactive material transportation not performed by DOE or a DOE contractor.	X	X	X	X	X		X	

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S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.01.01.315	10 CFR 835	Sub.A.835.1(c)	(c) Occupational doses received as a result of excluded activities and radioactive material transportation listed in paragraphs (b)(1) through (b)(4) and (b)(7) of this section, shall be included to the extent practicable when determining compliance with the occupational dose limits at 835.202 and 835.207, and with the limits for the embryo/fetus at 835.206. Occupational doses resulting from authorized emergency exposures and planned special exposures shall not be considered when determining compliance with the dose limits at 835.202 and 835.207. Note: Paragraphs (b)(1) through (b)(7) are provided as S/RID requirement 11.01.01.314 in this Functional Area.	X	X	X	X	X		X	
11.01.01.316	10 CFR 835	Sub.A.835.3(a)	(a) No person or DOE personnel shall take or cause to be taken any action inconsistent with the requirements of: (1)This part; or (2)Any program, plan, schedule, or other process established by this part.	X	X	X	X	X		X	
11.01.01.317	10 CFR 835	Sub.A.835.3(b)	(b) With respect to a particular DOE activity, contractor management shall be responsible for compliance with the requirements of this part.	X	X	X	X	X		X	
11.01.01.318	10 CFR 835	Sub.A.835.3(d)	(d) Nothing in this part shall be construed as limiting actions that may be necessary to protect health and safety.	X	X	X	X	X		X	
11.01.01.319	10 CFR 835	Sub.B.835.101(b)	(b) The DOE may direct or make modifications to a RPP.	X	X	X	X	X		X	
11.01.01.320	10 CFR 835	Sub.B.835.101(c)	(c) The content of each RPP shall be commensurate with the nature of the activities performed and shall include formal plans and measures for applying the as low as reasonably achievable (ALARA) process to occupational exposure.	X	X	X	X	X		X	
11.01.01.321	10 CFR 835	Sub.B.835.101(d)	(d) The RPP shall specify the existing and/or anticipated operational tasks that are intended to be within the scope of the RPP. Except as provided in 835.101(h), any task outside the scope of a RPP shall not be initiated until an update of the RPP is approved by DOE.	X	X	X	X	X		X	
11.01.01.322	10 CFR 835	Sub.B.835.101(e)	(e) The content of the RPP shall address, but shall not necessarily be limited to, each requirement in this part.	X	X	X	X	X		X	
11.01.01.323	10 CFR 835	Sub.B.835.101(f)	(f) The RPP shall include plans, schedules, and other measures for achieving compliance with regulations of this part. Unless otherwise specified in this part, compliance with amendments to this part published on June 8, 2007 shall be achieved no later than July 9, 2010.	X	X	X	X	X		X	
11.01.01.324	10 CFR 835	Sub.B.835.101(g)	(g) An update of the RPP shall be submitted to DOE: (1)Whenever a change or an addition to the RPP is made; (2)Prior to the initiation of a task not within the scope of the RPP; or (3)Within 180 days of the effective date of any modifications to this part.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.01.01.325	10 CFR 835	Sub.B.835.101(h)	(h) Changes, additions, or updates to the RPP may become effective without prior Department approval only if the changes do not decrease the effectiveness of the RPP and the RPP, as changed, continues to meet the requirements of this part. Proposed changes that decrease the effectiveness of the RPP shall not be implemented without submittal to and approval by the Department.	X	X	X	X	X		X	
11.01.01.326	10 CFR 835	Sub.B.835.101(i)	(i) An initial RPP or an update shall be considered approved 180 days after its submission unless rejected by DOE at an earlier date.	X	X	X	X	X		X	
11.01.01.327	10 CFR 835	Sub.B.835.102	Internal audits of the radiation protection program, including examination of program content and implementation, shall be conducted through a process that ensures that all functional elements are reviewed no less frequently than every 36 months.	X	X	X	X	X		X	
11.01.01.328	10 CFR 835	Sub.H.835.704(b)	(b) Actions taken to maintain occupational exposures as low as reasonably achievable, including the actions required for this purpose by 835.101, as well as facility design and control actions required by 835.1001, 835.1002 and 835.1003, shall be documented.	X	X	X	X	X		X	
11.01.01.329	10 CFR 835	Sub.H.835.704(c)	(c) Records shall be maintained to document the results of internal audits and other reviews of program content and implementation.	X	X	X	X	X		X	
11.01.01.330	10 CFR 835	Sub.K.835.1001 (a)	(a) Measures shall be taken to maintain radiation exposure in controlled areas ALARA through engineered and administrative controls. The primary methods used shall be physical design features (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls shall be employed only as supplemental methods to control radiation exposure.	X	X	X	X	X		X	
11.01.01.331	10 CFR 835	Sub.K.835.1001 (b)	(b) For specific activities where use of engineered controls is demonstrated to be impractical, administrative controls shall be used to maintain radiation exposures ALARA.	X	X	X	X	X		X	
11.01.01.332	10 CFR 835	Sub.K.835.1002 (a)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: (a) Optimization methods shall be used to assure that occupational exposure is maintained ALARA in developing and justifying facility design and physical controls.	X	X	X	X	X		X	
11.01.01.333	10 CFR 835	Sub.K.835.1002 (b)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: (b) The design objective for controlling personnel exposure from external sources of radiation in areas of continuous occupational occupancy (2000 hours per year) shall be to maintain exposure levels below an average of 0.5 millirem (5 µSv) per hour and as far below this average as is reasonably achievable. The design objectives for exposure rates for potential exposure to a radiological worker where occupancy differs from the above shall be ALARA and shall not exceed 20 percent of the applicable standards in 835.202.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.01.01.334	10 CFR 835	Sub.K.835.1002 (c)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: (c) Regarding the control of airborne radioactive material, the design objective shall be, under normal conditions, to avoid releases to the workplace atmosphere and in any situation, to control the inhalation of such material by workers to levels that are ALARA; confinement and ventilation shall normally be used.	X	X	X	X	X		X	
11.01.01.335	10 CFR 835	Sub.K.835.1002 (d)	During the design of new facilities or modification of existing facilities, the following objectives shall be adopted: (d) The design or modification of a facility and the selection of materials shall include features that facilitate operations, maintenance, decontamination, and decommissioning.	X	X	X	X	X		X	
11.01.01.336	10 CFR 835	Sub.K.835.1003 (a)	During routine operations, the combination of engineered and administrative controls shall provide that: (a) The anticipated occupational dose to general employees shall not exceed the limits established at 835.202; and	X	X	X	X	X		X	
11.01.01.337	10 CFR 835	Sub.K.835.1003 (b)	During routine operations, the combination of physical design features and administrative controls shall provide that: (b) The ALARA process is utilized for personnel exposures to ionizing radiation.	X	X	X	X	X		X	
11.01.01.338	DOE-STD-1098-99	113.3	The word "should" means the contractor has the responsibility of either following the provision or demonstrating technical equivalency by an alternative solution. The use of "should" recognizes that there may be site- or facility-specific attributes that warrant special treatment and that literal compliance with the provision may not achieve the desired level of radiological control performance. In those cases where a contractor decides to follow an alternative technique, approach or method in lieu of the "should" provision, the following actions are required: a. The alternative solution shall be documented, with supporting technical basis, analysis and justification to demonstrate technical equivalency. b. Prior to implementation, the approval of the Site Radiological Control Manager and, as applicable, the contractor's senior line manager responsible for operations shall be required. DOE-SR approval is not required nor expected. c. The technical equivalency determination shall be forwarded to DOE-SR following approval by SRR and shall be readily retrievable for review and audit by DOE-SR. Note: This requirement has been modified to meet SRS facility specific operational situation.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.01.01.339	10 CFR 835	Sub.A.835.1(d)	(d) The requirements in subparts F and G of this part do not apply to radioactive material transportation by DOE or a DOE contractor conducted: (1) Under the continuous observation and control of an individual who is knowledgeable of and implements required exposure control measures, or (2) In accordance with Department of Transportation regulations or DOE orders that govern such movements.	X	X	X	X	X		X	
11.01.02.218	10 CFR 835	Sub.B.835.103	Individuals responsible for developing and implementing measures necessary for ensuring compliance with the requirements of this part shall have the appropriate education, training, and skills to discharge these responsibilities.	X	X	X	X	X		X	
11.01.02.219	10 CFR 835	Sub.H.835.704(a)	(a) Training records shall be maintained, as necessary, to demonstrate compliance with 835.901.	X	X	X	X	X		X	
11.01.02.220	10 CFR 835	Sub.J.835.901(a)	(a) Each individual shall complete radiation safety training on the topics established at 835.901(c) commensurate with the hazards in the area and the required controls: (1)Before being permitted unescorted access to controlled areas; and (2)Before receiving occupational dose during access to controlled areas at a DOE site or facility.	X	X	X	X	X		X	
11.01.02.221	10 CFR 835	Sub.J.835.901(b)	(b) Each individual shall demonstrate knowledge of the radiation safety training topics established in 835.901(c), commensurate with the hazards in the area and required controls, by successful completion of an examination and performance demonstrations: (1)Before being permitted unescorted access to radiological areas; and (2)Before performing unescorted assignments as a radiological worker.	X	X	X	X	X		X	
11.01.02.222	10 CFR 835	Sub.J.835.901(c)	(c) Radiation safety training shall include the following topics, to the extent appropriate to each individual's prior training, work assignments, and degree of exposure to potential radiological hazards: (1)Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure; (2)Basic radiological fundamentals and radiation protection concepts; (3)Physical design features, administrative controls, limits, policies, procedures, alarms, and other measures implemented at the facility to manage doses and maintain doses ALARA, including both routine and emergency actions; (4)Individual rights and responsibilities as related to implementation of the facility radiation protection program; (5)Individual responsibilities for implementing ALARA measures required by 835.101; and (6)Individual exposure reports that may be requested in accordance with 835.801.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.01.02.223	10 CFR 835	Sub.J.835.901(d)	(d) When an escort is used in lieu of training in accordance with paragraph (a) or (b) of this section, the escort shall: (1)Have completed radiation safety training, examinations, and performance demonstrations required for entry to the area and performance of the work; and (2)Ensure that all escorted individuals comply with the documented radiation protection program.	X	X	X	X	X		X	
11.01.02.224	10 CFR 835	Sub.J.835.901(e)	(e) Radiation safety training shall be provided to individuals when there is a significant change to radiation protection policies and procedures that may affect the individual and at intervals not to exceed 24 months. Such training provided for individuals subject to the requirements of 835.901(b)(1) and (b)(2) shall include successful completion of an examination.	X	X	X	X	X		X	
11.02.01.017	ANSI N43.3 - 1993	8.1	Before a new installation is placed in routine operation, a radiation protection survey shall be made by a qualified expert. In the case of an unattended gauge installation, the surveyor need not be a qualified expert. However, the initial survey shall be performed by a person having the knowledge and training necessary to measure ionizing radiation and to advise users regarding radiation protection with respect to gauging devices.	X	X	X	X	X		X	
11.02.01.018	ANSI N43.3 - 1993	8.2	A radiation protection survey or reevaluation by a qualified expert (or as noted in 8.1 for an unattended gauge installation) shall be made when changes are planned to facility structures, shielding, operation, equipment, or occupancy of adjacent areas, and these changes may adversely affect radiation protection. Note: 8.1 as mentioned above is S/RID requirement 11.02.01.017 in this Functional Area.	X	X	X	X	X		X	
11.02.01.020	ANSI N43.3 - 1993	8.4	Any compliance deficiencies that may be found in the course of a survey shall be eliminated before the installation is placed in use.	X	X	X	X	X		X	
11.02.01.023	ANSI N43.3 - 1993	8.6.2	Devices that have a bearing on radiation protection shall be tested for proper operation. These include audible or visible warning signals, interlocks, emergency-off devices, timer delay switches, and mechanical or electrical devices that restrict positioning of the radiation source.	X	X	X	X	X		X	
11.02.01.026	ANSI N43.3 - 1993	8.7	All shields, interlocks, and other safety devices shall be inspected periodically and appropriately serviced as scheduled by the radiation protection supervisor (see 9.1). The interval between inspections shall not exceed six months.	X	X	X	X	X		X	

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S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.02.01.074	10 CFR 835	Sub.E.835.401(a)	(a) Monitoring of individuals and areas shall be performed to: (1) Demonstrate compliance with the regulations in this part; (2) Document radiological conditions; (3) Detect changes in radiological conditions; (4) Detect the gradual buildup of radioactive material; (5) Verify the effectiveness of engineered and administrative controls in containing radioactive material and reducing radiation exposure; and (6) Identify and control potential sources of individual exposure to radiation and/or radioactive material.	X	X	X	X	X		X	
11.02.01.075	10 CFR 835	Sub.F.835.502(c)	(c) Very high radiation areas. In addition to the above requirements, additional measures shall be implemented to ensure individuals are not able to gain unauthorized or inadvertent access to very high radiation areas.	X	X	X	X	X		X	
11.02.01.076	10 CFR 835	Sub.F.835.502(d)	(d) No control(s) shall be established in a high or very high radiation area that would prevent rapid evacuation of personnel.	X	X	X	X	X		X	
11.02.01.077	10 CFR 835	Sub.H.835.703	The following information shall be documented and maintained: (a)Results of monitoring for radiation and radioactive material as required by subparts E and L of this part, except for monitoring required by 835.1102(d); (b)Results of monitoring used to determine individual occupational dose from external and internal sources; (c)Results of monitoring for the release and control of material and equipment as required by 835.1101; and (d)Results of maintenance and calibration performed on instruments and equipment as required by 835.401(b).	X	X	X	X	X		X	
11.02.01.078	10 CFR 835	Sub.H.835.704(e)	(e) Changes in equipment, techniques, and procedures used for monitoring shall be documented.	X	X	X	X	X		X	
11.02.01.079	ANSI/HPS N43.2 - 2001	6.2.2.1.6	Systems that contain an x-ray tube shall be equipped with an interlock that shuts off the high voltage to the tube if the tube is removed from the radiation source housing or if the housing is disassembled.	X	X	X	X	X		X	
11.02.01.080	ANSI/HPS N43.2 - 2001	6.2.2.2.2	Each port of the radiation source housing shall be provided with a beam shutter interlocked with the x-ray accessory apparatus coupling, or collimator, in such a way that the port will be open only when the collimator or coupling is in place. Shutters at unused ports shall be secured to prevent casual opening. (Open Beam System)	X	X	X	X	X		X	
11.02.01.081	ANSI/HPS N43.2 - 2001	6.2.2.3.3	The system enclosure, sample chamber, etc. closure shall be interlocked with the x-ray tube high voltage supply and/or a shutter in the primary beam so that no x-ray beam can enter the sample chamber while it is open unless the interlock has been consciously and deliberately defeated. (Enclosed Beam Systems)	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.02.01.082	ANSI/HPS N43.2 - 2001	6.2.2.3.4	The interlock required by section 6.2.2.3.3 shall be of fail-safe design. (Enclosed Beam Systems) Note: Section 6.2.2.3.3 as mentioned above is S/RID requirement 11.02.01.081 in this Functional Area.	X	X	X	X	X		X	
11.02.01.083	ANSI/HPS N43.2 - 2001	7.2.1	A radiation survey and inspection and test of protective devices shall be made before a new installation is placed in routine operation, and whenever changes are made that could adversely affect radiation protection (e.g. maintenance, relocation of equipment, radiation shielding modifications, etc.	X	X	X	X	X		X	
11.02.02.035	10 CFR 835	Sub.C.835.209(a)	(a) The derived air concentration (DAC) values given in appendices A and C of this part shall be used in the control of occupational exposures to airborne radioactive material. Note: For Appendices A and C, see the Source Document.	X	X	X	X	X		X	
11.02.02.036	10 CFR 835	Sub.E.835.403(a)	(a) Monitoring of airborne radioactivity shall be performed: (1)Where an individual is likely to receive an exposure of 40 or more DAC-hours in a year; or (2)As necessary to characterize the airborne radioactivity hazard where respiratory protective devices for protection against airborne radionuclides have been prescribed.	X	X	X	X	X		X	
11.02.02.037	10 CFR 835	Sub.E.835.403(b)	(b) Real-time air monitoring shall be performed as necessary to detect and provide warning of airborne radioactivity concentrations that warrant immediate action to terminate inhalation of airborne radioactive material.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability: Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Phase I Compliance: Common	Facility Specific
11.02.02.038	10 CFR 835	835.App A	The data presented in appendix A are to be used for controlling individual internal doses in accordance with 835.209, identifying the need for air monitoring in accordance with 835.403, and identifying and posting airborne radioactivity areas in accordance with 835.603(d). The DAC values are given for individual radionuclides. For known mixtures of radionuclides, determine the sum of the ratio of the observed concentration of a particular radionuclide and its corresponding DAC for all radionuclides in the mixture. If this sum exceeds unity (1), then the DAC has been exceeded. For unknown radionuclides, the most restrictive DAC (lowest value) for those isotopes not known to be absent shall be used. For any single radionuclide not listed in appendix A with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than two hours, the DAC value shall be 4 E-11 µCi/mL (1 Bq/m³). For any single radionuclide not listed in appendix A that decays by alpha emission or spontaneous fission the DAC value shall be 2 E-13 µCi/mL (8 E-03 Bq/m³). The DACs for limiting radiation exposures through inhalation of radionuclides by workers are listed in this appendix. The values are based on either a stochastic (committed effective dose) dose limit of 5 rems (0.05 Sv) or a deterministic (organ or tissue) dose limit of 50 rems (0.5 Sv) per year, whichever is more limiting. Note: the 15 rems [0.15 Sv] dose limit for the lens of the eye does not appear as a critical organ dose limit. The columns in this appendix contain the following information: (1) Radionuclide; (2) inhaled air DAC for type F (fast), type M (moderate), and type S (slow) materials in units of µCi/mL; (3) inhaled air DAC for type F (fast), type M (moderate), and type S (slow) materials in units of Bq/m³; (4) an indication of whether or not the DAC for each class is controlled by the stochastic (effective dose) or deterministic (organ or tissue) dose. The absorption types (F, M, and S) have been established to describe the absorption type of the materials from the respiratory tract into the blood. The range of half-times for the absorption types correspond to: Type F, 100% at 10 minutes; Type M, 10% at 10 minutes and 90% at 140 days; and Type S, 0.1% at 10 minutes and 99.9% at 7000 days. The DACs are listed by radionuclide, in order of increasing atomic mass, and are based on the assumption that the particle size distribution of 5 micrometers AMAD is used.	X	X	X	X	X		X	

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				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.02.02.038	10 CFR 835	835.App A (Cont'd)	For situations where the particle size distribution is known to differ significantly from 5 micrometers AMAD, appropriate corrections may be made to both the estimated dose to workers and the DACs. Note: 1. For Appendix A, see the Source Document.	X	X	X	X	X		X	
11.03.01.081	ANSI N43.3 - 1993	9.3.3.1.3	The operator of radiation sources shall assure that personnel who enter the controlled area are wearing personnel monitoring devices in accordance with 9.4 of this standard.	X	X	X	X	X		X	
11.03.01.180	10 CFR 835	Sub.C.835.204(e)	(e) Records of the conduct of a planned special exposure shall be maintained and a written report submitted within 30 days after the planned special exposure to the approving organizations identified in 835.204(a)(3).	X	X	X	X	X		X	
11.03.01.181	10 CFR 835	Sub.E.835.402(a)	(a) For the purpose of monitoring individual exposures to external radiation, personnel dosimeters shall be provided to and used by: (1) Radiological workers who, under typical conditions, are likely to receive one or more of the following: (i) An effective dose of 0.1 rem (0.001 Sv) or more in a year; (ii) An equivalent dose to the skin or to any extremity of 5 rems (0.05 Sv) or more in a year; (iii) An equivalent dose to the lens of the eye of 1.5 rems (0.015 Sv) or more in a year; (2) Declared pregnant workers who are likely to receive from external sources an equivalent dose to the embryo/fetus in excess of 10 percent of the applicable limit at 835.206(a); (3) Occupationally exposed minors likely to receive a dose in excess of 50 percent of the applicable limits at 835.207 in a year from external sources; (4) Members of the public entering a controlled area likely to receive a dose in excess of 50 percent of the limit at 835.208 in a year from external sources; and (5) Individuals entering a high or very high radiation area.	X	X	X	X	X		X	

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11.03.01.182	10 CFR 835	Sub.E.835.402(c)	(c) For the purpose of monitoring individual exposures to internal radiation, internal dosimetry programs (including routine bioassay programs) shall be conducted for: (1) Radiological workers who, under typical conditions, are likely to receive a committed effective dose of 0.1 rem (0.001 Sv) or more from all occupational radionuclide intakes in a year; (2) Declared pregnant workers likely to receive an intake or intakes resulting in an equivalent dose to the embryo/fetus in excess of 10 percent of the limit stated at 835.206(a); (3) Occupationally exposed minors who are likely to receive a dose in excess of 50 percent of the applicable limit stated at 835.207 from all radionuclide intakes in a year; or (4) Members of the public entering a controlled area likely to receive a dose in excess of 50 percent of the limit stated at 835.208 from all radionuclide intakes in a year.	X	X	X	X	X		X	
11.03.01.183	10 CFR 835	Sub.H.835.701(a)	(a) Records shall be maintained to document compliance with this part and with radiation protection programs required by 835.101.	X	X	X	X	X		X	
11.03.01.184	10 CFR 835	Sub.H.835.701(b)	(b) Unless otherwise specified in this subpart, records shall be retained until final disposition is authorized by DOE.	X	X	X	X	X		X	
11.03.01.185	10 CFR 835	Sub.H.835.702(a)	(a) Except as authorized by 835.702(b), records shall be maintained to document doses received by all individuals for whom monitoring was conducted and to document doses received during planned special exposures, unplanned doses exceeding the monitoring thresholds of 835.402, and authorized emergency exposures.	X	X	X	X	X		X	
11.03.01.186	10 CFR 835	Sub.H.835.702(b)	(b) Recording of the non-uniform equivalent dose to the skin is not required if the dose is less than 2 percent of the limit specified for the skin at 835.202(a)(4). Recording of internal dose (committed effective dose or committed equivalent dose) is not required for any monitoring result estimated to correspond to an individual receiving less than 0.01 rem (0.1 mSv) committed effective dose. The bioassay or air monitoring result used to make the estimate shall be maintained in accordance with 835.703(b) and the unrecorded internal dose estimated for any individual in a year shall not exceed the applicable monitoring threshold at 835.402(c).	X	X	X	X	X		X	

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11.03.01.187	10 CFR 835	Sub.H.835.702(c)	(c) The records required by this section shall: (1) Be sufficient to evaluate compliance with subpart C of this part; (2) Be sufficient to provide dose information necessary to complete reports required by subpart I of this part; (3) Include the results of monitoring used to assess the following quantities for external dose received during the year: (i) The effective dose from external sources of radiation (equivalent dose to the whole body may be used as effective dose for external exposure); (ii) The equivalent dose to the lens of the eye; (iii) The equivalent dose to the skin; and (iv) The equivalent dose to the extremities. (4) Include the following information for internal dose resulting from intakes received during the year: (i) Committed effective dose; (ii) Committed equivalent dose to any organ or tissue of concern; and (iii) Identity of radionuclides. (5) Include the following quantities for the summation of the external and internal dose: (i) Total effective dose in a year; (ii) For any organ or tissue assigned an internal dose during the year, the sum of the equivalent dose to the whole body from external exposures and the committed equivalent dose to that organ or tissue; and (iii) Cumulative total effective dose. (6) Include the equivalent dose to the embryo/fetus of a declared pregnant worker.	X	X	X	X	X		X	
11.03.01.188	10 CFR 835	Sub.H.835.702(d)	(d) Documentation of all occupational doses received during the current year, except for doses resulting from planned special exposures conducted in compliance with 835.204 and emergency exposures authorized in accordance with 835.1302(d), shall be obtained to demonstrate compliance with 835.202(a). If complete records documenting previous occupational dose during the year cannot be obtained, a written estimate signed by the individual may be accepted to demonstrate compliance.	X	X	X	X	X		X	
11.03.01.189	10 CFR 835	Sub.H.835.702(e)	(e) For radiological workers whose occupational dose is monitored in accordance with 835.402, reasonable efforts shall be made to obtain complete records of prior years occupational internal and external doses.	X	X	X	X	X		X	
11.03.01.190	10 CFR 835	Sub.H.835.702(f)	(f) The records specified in this section that are identified with a specific individual shall be readily available to that individual.	X	X	X	X	X		X	
11.03.01.191	10 CFR 835	Sub.H.835.702(g)	(g) Data necessary to allow future verification or reassessment of the recorded doses shall be recorded.	X	X	X	X	X		X	
11.03.01.192	10 CFR 835	Sub.H.835.702(h)	(h) All records required by this section shall be transferred to the DOE upon cessation of activities at the site that could cause exposure to individuals.	X	X	X	X	X		X	

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11.03.01.193	10 CFR 835	Sub.H.835.704(d)	(d) Written declarations of pregnancy, including the estimated date of conception, and revocations of declarations of pregnancy shall be maintained.	X	X	X	X	X		X	
11.03.01.194	10 CFR 835	Sub.I.835.801(a)	(a) Radiation exposure data for individuals monitored in accordance with 835.402 shall be reported as specified in this section. The information shall include the data required under 835.702(c). Each notification and report shall be in writing and include: the DOE site or facility name, the name of the individual, and the individual's social security number, employee number, or other unique identification number.	X	X	X	X	X		X	
11.03.01.195	10 CFR 835	Sub.I.835.801(b)	(b) Upon the request from an individual terminating employment, records of exposure shall be provided to that individual as soon as the data are available, but not later than 90 days after termination. A written estimate of the radiation dose received by that employee based on available information shall be provided at the time of termination, if requested.	X	X	X	X	X		X	
11.03.01.196	10 CFR 835	Sub.I.835.801(c)	(c) Each DOE- or DOE-contractor-operated site or facility shall, on an annual basis, provide a radiation dose report to each individual monitored during the year at that site or facility in accordance with 835.402.	X	X	X	X	X		X	
11.03.01.197	10 CFR 835	Sub.I.835.801(d)	(d) Detailed information concerning any individual's exposure shall be made available to the individual upon request of that individual, consistent with the provisions of the Privacy Act (5 U.S.C. 552a).	X	X	X	X	X		X	
11.03.01.198	10 CFR 835	Sub.I.835.801(e)	(e) When a DOE contractor is required to report to the Department, pursuant to Departmental requirements for occurrence reporting and processing, any exposure of an individual to radiation and/or radioactive material, or planned special exposure in accordance with 835.204(e), the contractor shall also provide that individual with a report on his or her exposure data included therein. Such report shall be transmitted at a time not later than the transmittal to the Department.	X	X	X	X	X		X	
11.03.01.199	10 CFR 835	Sub.N.835.1304 (a)	(a) Installations possessing sufficient quantities of fissile material to potentially constitute a critical mass, such that the excessive exposure of individuals to radiation from a nuclear accident is possible, shall provide nuclear accident dosimetry for those individuals.	X	X	X	X	X		X	
11.03.01.200	10 CFR 835	Sub.N.835.1304 (b)	(b) Nuclear accident dosimetry shall include the following: (1)A method to conduct initial screening of individuals involved in a nuclear accident to determine whether significant exposures to radiation occurred; (2)Methods and equipment for analysis of biological materials; (3)A system of fixed nuclear accident dosimeter units; and (4)Personal nuclear accident dosimeters.	X	X	X	X	X		X	

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S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.208	DOEO231.1B_ AChg1	Att.1.3	3. Reporting Ionizing Radiation Exposure Information Contractors must comply with the requirements in Attachment 4, which pertain to reporting ionizing radiation exposure information. Note: Attachment 4 is added as S/RID requirements 11.03.01.212 to 11.03.01.218 in this Functional Area.	X	X	X	X	X		X	
11.03.01.209	DOEO231.1B_ AChg1	Att.1.4.a	4. Reporting of Radioactive Sealed Sources Information a. Contractors who own, possess, use, or maintain in custody those radioactive sealed sources that meet the criteria of 10 C.F.R. Part 835, Occupational Radiation Protection, Subpart M and Appendix E, including sources that meet the criteria of 10 C.F.R. Part 835 Appendix E that have been identified for disposal but not yet disposed and radioisotope thermoelectric generators (RTGs) are responsible for complying with the inventory reporting requirements in Attachment 5 of this Directive. Note: Attachment 5 is added as S/RID requirements 11.03.01.219 to 11.03.01.239 in this Functional Area.	X	X	X	X	X		X	
11.03.01.210	DOEO231.1B_ AChg1	Att.1.4.b	4. Reporting of Radioactive Sealed Sources Information b. Contractors who own, possess, use, or maintain in custody those radioactive sealed sources that meet the criteria for IAEA Categories 1 and 2 radioactive sealed sources as identified in Attachment 5 of this Directive are responsible for complying with the transaction reporting requirements in Attachment 5 of this Directive. Note: Attachment 5 is added as S/RID requirements 11.03.01.219 to 11.03.01.239 in this Functional Area.	X	X	X	X	X		X	
11.03.01.211	DOEO231.1B_ AChg1	Att.1.4.c	4. Reporting of Radioactive Sealed Sources Information c. A violation of the provisions of the CRD relating to the safeguarding or security of Restricted Data (RD) or other classified information may result in a civil penalty pursuant to subsection a. section 234B of the Atomic Energy Act of 1954 (42 U.S.C. § 2282b). The procedures for the assessment of civil penalties are set forth in 10 C.F.R. Part 824, Procedural Rules for the Assessment of Civil Penalties for Classified Information Security Violations.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.212	DOEO231.1B_AChg1	Att.4.1.a	Reporting Ionizing Radiation Exposure Information 1. Annual Individual Radiation Exposure Records a. Annual radiation exposure records for the preceding monitoring year, required to be collected by 10 C.F.R. § 835.702, must be reported to the REMS repository by March 31. The records must include exposure records for special individuals as defined in Attachment 4, paragraph 2a. Note: Attachment 4, paragraph 2a is added as S/RID requirements 11.03.01.214 in this Functional Area.	X	X	X	X	X		X	
11.03.01.213	DOEO231.1B_AChg1	Att.4.1.b	Reporting Ionizing Radiation Exposure Information 1. Annual Individual Radiation Exposure Records b. Revisions to radiation exposure records for monitoring periods beginning on or after January 1, 1989, must be reported to the REMS repository. Revised records for prior monitoring years must be submitted annually by March 31. However, if the revised dose record results in a dose exceeding regulatory dose limits defined in 10 C.F.R. § 835.202, revised records must be submitted within 30 days of the revision to the dose record. Revised records must be submitted to the REMS repository in a separate file in the same format as annual records. The transmittal documentation must identify the enclosed records as revised records.	X	X	X	X	X		X	
11.03.01.214	DOEO231.1B_AChg1	Att.4.2.a	Reporting Ionizing Radiation Exposure Information 2. Radiation Exposure Records for Special Individuals a. Radiation exposure data pertaining to special individuals, which includes individuals employed by DOE Headquarters, a contractor supporting DOE Headquarters or Field Office activities, a Defense Nuclear Facilities Safety Board employee or contractor, or an International Atomic Energy Agency inspector who visits a DOE or DOE contractor site or facility to conduct Department-related business, must be reported to the REMS repository simultaneous with dispatch of reports to individuals, within 30 days after the assessment of the radiation exposure.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.215	DOEO231.1B_AChg1	Att.4.2.b	Reporting Ionizing Radiation Exposure Information 2. Radiation Exposure Records for Special Individuals b. Each employee or special individual who is acting in an official capacity at a non- DOE facility and is monitored for occupational radiation exposure must provide the monitoring results to their employer within 30 days of receipt. Employers must instruct individuals of this responsibility prior to directing individuals to conduct such activities at a non-DOE facility.	X	X	X	X	X		X	
11.03.01.216	DOEO231.1B_AChg1	Att.4.2.c	Reporting Ionizing Radiation Exposure Information 2. Radiation Exposure Records for Special Individuals c. Procedures to effectively support the collection of dosimetry records in support of this requirement must be verified on a regular basis.	X	X	X	X	X		X	
11.03.01.217	DOEO231.1B_AChg1	Att.4.3	Reporting Ionizing Radiation Exposure Information 3. Report Format All occupational radiation exposure reports of records collected and sent to the REMS repository as noted in Attachment 4, paragraphs 1 and 2 must be prepared in accordance with the REMS Reporting Guide located at http://www.hss.doe.gov/csa/analysis/rems/REMS_Reporting_Guide.pdf and submitted in electronic format in accordance with the current HSS policy for submitting personally identifiable information (PII) to the REMS repository as posted on the REMS web page at http://www.hss.doe.gov/csa/analysis/rems/PII_reporting_requirements_F-5-13- 09_FNL.pdf. Note: Attachment 4, paragraphs 1 and 2 are added as S/RID requirements 11.03.01.212 to 11.03.01.216 in this Functional Area.	X	X	X	X	X		X	
11.03.01.218	DOEO231.1B_AChg1	Att.4.4	Reporting Ionizing Radiation Exposure Information 4. Exposure Reports to Individuals Reports to individuals must be prepared in accordance with 10 C.F.R. § 835.801.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.219	DOEO231.1B_AChg1	Att.5.1.a	Reporting Radioactive Sealed Source Information 1. Planning and Administration a. DOE will maintain a centralized reporting capability, the Radiological Source Registry and Tracking (RSRT) database, which serves as DOE's centralized repository for inventory and transaction data on radioactive sealed sources and is used by DOE to provide appropriate data on IAEA Category 1 and 2 radioactive sealed sources to the NRC National Source Tracking System (NSTS).	X	X	X	X	X		X	
11.03.01.220	DOEO231.1B_AChg1	Att.5.1.b	Reporting Radioactive Sealed Source Information 1. Planning and Administration b. Accountable radioactive sealed sources that meet the criteria of 10 C.F.R. Part 835, Subpart M and Appendix E, including sources that meet the criteria of 10 C.F.R. Part 835 Appendix that have been identified for disposal but not yet disposed and radioisotope thermoelectric generators (RTGs), must be reported as inventory to the DOE RSRT database per the requirements of this Directive. See also Definitions and Abbreviations.	X	X	X	X	X		X	
11.03.01.221	DOEO231.1B_AChg1	Att.5.1.c	Reporting Radioactive Sealed Source Information 1. Planning and Administration c. In addition, radioactive sealed sources that meet the criteria of IAEA Category 1 or 2 radioactive sealed sources (as identified in Appendix A <4>) must be reported as transactions to the RSRT. <4> (NOTE: Category 3 radioactive sealed sources are presented in Appendix A for informational purposes only.)	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.222	DOEO231.1B_AChg1	Att.5.1.d	Reporting Radioactive Sealed Source Information 1. Planning and Administration d. All site/facility operators using or storing radioactive sealed sources as referenced above must— (1) Maintain radioactive materials programs that ensure the accountability of radioactive sealed sources identified in this Directive. (2) Ensure that site and facility radioactive sealed source accounting systems are established to provide accurate radioactive sealed source transaction information relating to the manufacture, transfer (shipment), receipt, inventory, disassembly, and disposal of Category 1 and 2 radioactive sealed sources as listed in Appendix A. (3) Ensure that aggregation of individual radioactive sealed sources is taken into account in the protection during transfer (shipment). (4) Ensure that classified data or information that would divulge a classified program is not reported to DOE RSRT, which is maintained as Official Use Only (OUO/Controlled Unclassified Information (CUI).	X	X	X	X	X		X	
11.03.01.223	DOEO231.1B_AChg1	Att.5.2	Reporting Radioactive Sealed Source Information 2. General Requirements a. Information regarding specific radioactive sealed sources will remain on the active DOE RSRT inventory until transferred (shipped), disassembled or disposed of from the DOE site. b. Radioisotope decay will be taken into account in the transaction reporting of Category 1 and 2 radioactive sealed sources. c. For Category 1 and 2 radioactive sealed sources, any missed transaction or errors found in previously filed inventory or transaction reports will be corrected or a new report will be filed within five business days of the discovery of the error or missed transaction.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.224	DOEO231.1B_AChg1	Att.5.3	Reporting Radioactive Sealed Source Information 3. Serialization of IAEA Category 1 and 2 Radioactive Sealed Sources (See Appendix A) After the effective date of this Directive: a. A unique alpha-numeric serial number must be assigned to each Category 1 or 2 radioactive sealed source upon manufacture. b. If a unique serial number is not available for existing Category 1 or 2 sealed sources, other information to uniquely identify the source must be used.	X	X	X	X	X		X	
11.03.01.225	DOEO231.1B_AChg1	Att.5.4	Reporting Radioactive Sealed Source Information 4. Baseline (Initial) Inventory of Accountable Radioactive Sealed Sources a. Each DOE site/facility operator that possesses accountable radioactive sealed sources that meet the criteria of 10 C.F.R. Part 835 Subpart M and Appendix E, including sources that meet the criteria of 10 C.F.R. Part 835 Appendix E that have been identified for disposal but not yet disposed and radioisotope thermoelectric generators (RTGs), must report its initial inventory, if initial inventory was not already reported with baseline inventory in 2008, or verify previously reported inventory to the RSRT. b. The information may be submitted by using any of the methods identified in paragraph 6(e.) of this Directive. c. If multiple isotopes are in an individual source, a record for each isotope must be submitted. (See also Appendix B, Required Fields for Inventory and Transaction Reporting). d. The Baseline (initial) inventory must include the data fields as identified in Appendix B, Required Fields for Inventory and Transaction Reporting, under “Inventory Reporting”. Note: Paragraph 6(e) is added as S/RID requirements 11.03.01.231 in this Functional Area.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.226	DOEO231.1B_AChg1	Att.5.5	Reporting Radioactive Sealed Source Information 5. Verification of Book Inventory Records a. The book inventory of radioactive sealed sources must be verified annually against the site/facility operator's listing in the RSRT. b. The book inventory verification may be satisfied at each DOE site in conjunction with existing inventory requirements under 10 CFR Part 835, Occupational Radiation Protection.	X	X	X	X	X		X	
11.03.01.227	DOEO231.1B_AChg1	Att.5.6.a	Reporting Radioactive Sealed Source Information 6. Transaction Reporting to the RSRT of IAEA Category 1 and 2 Radioactive Sealed Sources a. A Sealed Source Transaction Report must be completed and submitted to the RSRT database for IAEA Categories 1 and 2 solid radioactive sealed sources as identified in Appendix A for each of the following types of transactions: <5> (1) manufacture (a new or initially identified source), (2) transfer (shipment), (3) receipt, (4) disassembly and (5) disposal (e.g. final end-of-life action) <5> See also - Regenerated (Radioactive sealed Source) under Definitions and Abbreviations section.	X	X	X	X	X		X	
11.03.01.228	DOEO231.1B_AChg1	Att.5.6.b	Reporting Radioactive Sealed Source Information 6. Transaction Reporting to the RSRT of IAEA Category 1 and 2 Radioactive Sealed Sources b. For shipments, disassembly and disposal, it is assumed that the baseline (initial) information for the sources has already been reported to the RSRT database.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.229	DOEO231.1B_AChg1	Att.5.6.c	Reporting Radioactive Sealed Source Information 6. Transaction Reporting to the RSRT of IAEA Category 1 and 2 Radioactive Sealed Sources c. For each DOE site/facility operator that manufactures (or initially identifies), ships, receives, disassembles, or disposes of a Category 1 or 2 radioactive sealed sources, the transaction report must include the data fields as specified in Appendix B, Required Fields for Inventory and Transaction Reporting.	X	X	X	X	X		X	
11.03.01.230	DOEO231.1B_AChg1	Att.5.6.d	Reporting Radioactive Sealed Source Information 6. Transaction Reporting to the RSRT of IAEA Category 1 and 2 Radioactive Sealed Sources d. The transaction reports discussed in paragraphs 6 a-c must be submitted to the RSRT within five business days after the transaction. Note: Paragraph 6 a-c is added as S/RID requirements 11.03.01.227 to 11.03.01.229 in this Functional Area.	X	X	X	X	X		X	
11.03.01.231	DOEO231.1B_AChg1	Att.5.6.e	Reporting Radioactive Sealed Source Information 6. Transaction Reporting to the RSRT of IAEA Category 1 and 2 Radioactive Sealed Sources e. The reports must be submitted to the RSRT by using one of the following modes, in accordance with site and DOE data transmission requirements for the protection of the information: (1) the on-line system at such time as established and available to the DOE sites; or (2) electronic format, pre-defined, computer-readable format; or (3) facsimile or e-mail using a pre-defined format.	X	X	X	X	X		X	
11.03.01.232	DOEO231.1B_AChg1	Att.5.7.a	Reporting Radioactive Sealed Source Information 7. Annual Reconciliation of Category 1 and 2 Radioactive Sealed Source Information a. Each DOE site/facility operator must reconcile and verify Categories 1 and 2 radioactive sealed source physical inventories annually against the site/facility operator's data in the DOE RSRT.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.233	DOEO231.1B_AChg1	Att.5.7.b	Reporting Radioactive Sealed Source Information 7. Annual Reconciliation of Category 1 and 2 Radioactive Sealed Source Information b. Modifications made to the RSRT inventory must be submitted as transactions via the reports identified in paragraphs 6 a-c or as inventory correction as defined below. (1) Inventory corrections for Category 1 or 2 radioactive sealed sources will be made within five business days of the discovery of the error or missed inventory. (2) Reconciliation and verification must be based upon December 31 inventories and submitted to the RSRT within 3 weeks after the end of the calendar year. Note: Paragraph 6 a-c is added as S/RID requirements 11.03.01.227 to 11.03.01.229 in this Functional Area.	X	X	X	X	X		X	
11.03.01.234	DOEO231.1B_AChg1	Att.5.8.a	Reporting Radioactive Sealed Source Information 8. Verification of Authorities for Receipt of Accountable Radioactive Sealed Sources a. Accountable radioactive sealed sources must not be transferred from a DOE organization or from a DOE contractor except as authorized.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.235	DOEO231.1B_AChg1	Att.5.8.b	Reporting Radioactive Sealed Source Information 8. Verification of Authorities for Receipt of Accountable Radioactive Sealed Sources b. Except as otherwise provided in this section and subject to the provisions of paragraphs 8(c) of this section, an accountable radioactive sealed source may be transferred— (1) to another authorized DOE organization or DOE contractor; (2) to the agency in any NRC agreement state, which regulates radioactive material pursuant to an agreement under section 274(b) of the Atomic Energy Act of 1954 (as amended); (3) to any person authorized to receive such radioactive material under terms of a specific license or a general license or their equivalents issued by the NRC or an Agreement State; (4) to a person abroad pursuant to an export license issued under Departmental requirements or NRC regulations as applicable; or (5) as otherwise authorized by the Department in writing. Note: Paragraph 8(c) is added as S/RID requirements 11.03.01.236 in this Functional Area.	X	X	X	X	X		X	
11.03.01.236	DOEO231.1B_AChg1	Att.5.8.c	Reporting Radioactive Sealed Source Information 8. Verification of Authorities for Receipt of Accountable Radioactive Sealed Sources c. Before transferring an accountable radioactive sealed source to a DOE organization or contractor, a specific licensee of the NRC or an agreement state, or a general licensee who is required to register with the NRC or with an agreement state prior to receipt of the material, the transferor of the material will obtain written verification that the transferee's DOE approved radiation protection program or license encompasses or authorizes the receipt of the type, form, and quantity of material to be transferred. Verification methods include: (1) Current copy of the transferee's specific license or registration certificate, or DOE authorization; (2) The transferor may obtain other sources of information compiled by a reporting service from official records of the NRC, the licensing agency of an Agreement State, or the Department.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.01.237	DOEO231.1B_AChg1	Att.5.9	Reporting Radioactive Sealed Source Information 9. Records (1) Inventory and accountability reporting procedures must be documented for all accountable radioactive sealed sources as defined by this Directive. (2) See 10 CFR Part 835 for additional documentation and record keeping requirements for accountable radioactive sealed sources (http://www.hss.energy.gov/healthsafety/wshp/radiation/). (3) See DOE Record Retention Scheduling for information about DOE records retention and disposition requirements (http://www.cio.energy.gov/records-management.htm).	X	X	X	X	X		X	
11.03.01.238	DOEO231.1B_AChg1	Att.5.App.A	Attachment 5, Appendix A, (Table of Radioactive Sealed Sources) can be found in DOE O 231.1B.	X	X	X	X	X		X	
11.03.01.239	DOEO231.1B_AChg1	Att.5.App.B	Attachment 5, Appendix B, (Required Fields for Inventory and Transaction Reporting) can be found in DOE O 231.1B.	X	X	X	X	X		X	
11.03.02.046	10 CFR 835	Sub.C.835.202(a)	(a) Except for planned special exposures conducted consistent with 835.204 and emergency exposures authorized in accordance with 835.1302, the occupational dose received by general employees shall be controlled such that the following limits are not exceeded in a year: (1) A total effective dose of 5 rems (0.05 Sv); (2) The sum of the equivalent dose to the whole body for external exposures and the committed equivalent dose to any organ or tissue other than the skin or the lens of the eye of 50 rems (0.5 Sv); (3) An equivalent dose to the lens of the eye of 15 rems (0.15 Sv); and (4) The sum of the equivalent dose to the skin or to any extremity for external exposures and the committed equivalent dose to the skin or to any extremity of 50 rems (0.5 Sv)	X	X	X	X	X		X	
11.03.02.047	10 CFR 835	Sub.C.835.202(b)	(b) All occupational doses received during the current year, except doses resulting from planned special exposures conducted in compliance with 835.204 and emergency exposures authorized in accordance with 835.1302, shall be included when demonstrating compliance with 835.202(a) and 835.207.	X	X	X	X	X		X	
11.03.02.048	10 CFR 835	Sub.C.835.202(c)	(c) Doses from background, therapeutic and diagnostic medical radiation, and participation as a subject in medical research programs shall not be included in dose records or in the assessment of compliance with the occupational dose limits.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.02.049	10 CFR 835	Sub.C.835.204(a)	(a) A planned special exposure may be authorized for a radiological worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in 835.202(a), provided that each of the following conditions is satisfied: (1)The planned special exposure is considered only in an exceptional situation when alternatives that might prevent a radiological worker from exceeding the limits in 835.202(a) are unavailable or impractical; (2)The contractor management (and employer, if the employer is not the contractor) specifically requests the planned special exposure, in writing; and (3)Joint written approval is received from the appropriate DOE Headquarters program office and the Secretarial Officer responsible for environment, safety and health matters.	X	X	X	X	X		X	
11.03.02.050	10 CFR 835	Sub.C.835.204(b)	(b) Prior to requesting an individual to participate in an authorized planned special exposure, the individual's dose from all previous planned special exposures and all doses in excess of the occupational dose limits shall be determined.	X	X	X	X	X		X	
11.03.02.051	10 CFR 835	Sub.C.835.204(c)	(c) An individual shall not receive a planned special exposure that, in addition to the doses determined in 835.204(b), would result in a dose exceeding the following: (1)In a year, the numerical values of the dose limits established at 835.202(a); and (2)Over the individual's lifetime, five times the numerical values of the dose limits established at 835.202(a).	X	X	X	X	X		X	
11.03.02.052	10 CFR 835	Sub.C.835.204(d)	(d) Prior to a planned special exposure, written consent shall be obtained from each individual involved. Each such written consent shall include: (1)The purpose of the planned operations and procedures to be used; (2)The estimated doses and associated potential risks and specific radiological conditions and other hazards which might be involved in performing the task; and (3)Instructions on the measures to be taken to keep the dose ALARA considering other risks that may be present.	X	X	X	X	X		X	
11.03.02.054	10 CFR 835	Sub.C.835.204(f)	(f) The dose from planned special exposures is not to be considered in controlling future occupational dose of the individual under 835.202(a), but is to be included in records and reports required under this part.	X	X	X	X	X		X	
11.03.02.055	10 CFR 835	Sub.C.835.206(a)	(a) The equivalent dose limit for the embryo/fetus from the period of conception to birth, as a result of occupational exposure of a declared pregnant worker, is 0.5 rem (0.005 Sv).	X	X	X	X	X		X	
11.03.02.056	10 CFR 835	Sub.C.835.206(b)	(b) Substantial variation above a uniform exposure rate that would satisfy the limits provided in 835.206(a) shall be avoided.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.02.057	10 CFR 835	Sub.C.835.206(c)	(c) If the equivalent dose to the embryo/fetus is determined to have already exceeded 0.5 rem (0.005 Sv) by the time a worker declares her pregnancy, the declared pregnant worker shall not be assigned to tasks where additional occupational exposure is likely during the remaining gestation period.	X	X	X	X	X		X	
11.03.02.058	10 CFR 835	Sub.C.835.207	The dose limits for minors occupationally exposed to radiation and/or radioactive materials at a DOE activity are 0.1 rem (0.001 Sv) total effective dose in a year and 10 percent of the occupational dose limits specified at 835.202(a)(3) and (a)(4).	X	X	X	X	X		X	
11.03.02.059	10 CFR 835	Sub.C.835.208	The total effective dose limit for members of the public exposed to radiation and/or radioactive material during access to a controlled area is 0.1 rem (0.001 Sv) in a year.	X	X	X	X	X		X	
11.03.02.060	10 CFR 835	Sub.C.835.209(b)	(b) The estimation of internal dose shall be based on bioassay data rather than air concentration values unless bioassay data are: (1)unavailable; (2)inadequate; or (3)internal dose estimates based on air concentration values are demonstrated to be as or more accurate.	X	X	X	X	X		X	
11.03.02.061	10 CFR 835	Sub.N.835.1301 (a)	(a) A general employee whose occupational dose has exceeded the numerical value of any of the limits specified in 835.202 as a result of an authorized emergency exposure may be permitted to return to work in radiological areas during the current year providing that all of the following conditions are met: (1)Approval is first obtained from the contractor management and the Head of the responsible DOE field organization; (2)The individual receives counseling from radiological protection and medical personnel regarding the consequences of receiving additional occupational exposure during the year; and (3)The affected employee agrees to return to radiological work.	X	X	X	X	X		X	
11.03.02.062	10 CFR 835	Sub.N.835.1301 (b)	(b)All doses exceeding the limits specified in 835.202 shall be recorded in the affected individual's occupational dose record.	X	X	X	X	X		X	
11.03.02.063	10 CFR 835	Sub.N.835.1301 (c)	(c) When the conditions under which a dose was received in excess of the limits specified in 835.202, except those received in accordance with 835.204, have been eliminated, operating management shall notify the Head of the responsible DOE field organization.	X	X	X	X	X		X	
11.03.02.064	10 CFR 835	Sub.N.835.1301 (d)	(d) Operations which have been suspended as a result of a dose in excess of the limits specified in 835.202, except those received in accordance with 835.204, may be resumed only with the approval of DOE.	X	X	X	X	X		X	
11.03.02.065	10 CFR 835	Sub.N.835.1302 (a)	(a) The risk of injury to those individuals involved in rescue and recovery operations shall be minimized.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.03.02.066	10 CFR 835	Sub.N.835.1302 (b)	(b) Operating management shall weigh actual and potential risks against the benefits to be gained.	X	X	X	X	X		X	
11.03.02.067	10 CFR 835	Sub.N.835.1302 (c)	(c) No individual shall be required to perform rescue action that might involve substantial personal risk.	X	X	X	X	X		X	
11.03.02.068	10 CFR 835	Sub.N.835.1302 (d)	(d) Each individual authorized to perform emergency actions likely to result in occupational doses exceeding the values of the limits provided at 835.202(a) shall be trained in accordance with 835.901(b) and briefed beforehand on the known or anticipated hazards to which the individual will be subjected.	X	X	X	X	X		X	
11.03.02.069	ANSI/HPS N43.2 - 2001	6.2.2.1.1	The dose due to unwanted, stray, or anticipated accidental scatter and leakage radiation from components such as high voltage rectifiers shall not exceed 0.1 mSv (10 mrem) in a week in any accessible region 5 cm from the outside surface of the generator cabinet. Assuming that an individual may be in the vicinity of the equipment while it is operating for as long as 40 hours per week, the dose rate should not exceed 0.0025 mSv/hr (0.25 mrem/hr).	X	X	X	X	X		X	
11.03.02.070	ANSI/HPS N43.2 - 2001	6.2.2.1.2	The x-ray accessory apparatus shall include a beam stop, trap or other barrier with sufficient shielding so that the dose rate due to the transmitted primary beam does not exceed 0.0025 mSv/hr (0.25 mrem/hr) under normal operating conditions.	X	X	X	X	X		X	
11.03.02.071	ANSI/HPS N43.2 - 2001	6.2.2.1.8	Normal operating procedures shall be such that a qualified operator following instructions will not receive in any one hour a dose equivalent in excess of 0.25 mSv (25 mrem) to the extremities or 0.025 mSv (2.5 mrem) to the whole body.	X	X	X	X	X		X	
11.03.02.072	ANSI/HPS N43.2 - 2001	6.2.2.1.9	Alignment procedures should be such that a qualified worker aware of the radiation hazards will not receive in any one hour a dose equivalent in excess of 0.25 mSv (25 mrem) to the extremities or 0.025 mSv (2.5 mrem) to the whole body while following these instructions. If either of these dose rates is likely to be exceeded, a warning shall be included in the alignment instructions.	X	X	X	X	X		X	
11.03.02.073	ANSI/HPS N43.2 - 2001	6.2.2.2.1	Radiation levels external to the x-ray tube housing with all shutters closed shall not exceed 0.025 mSv/hr (2.5 mrem/hr) as measured at 5 cm from the surface of the housing within which an x-ray tube is operating at full rated power at maximum rated accelerating potential. (Open Beam System)	X	X	X	X	X		X	
11.03.02.074	ANSI/HPS N43.2 - 2001	6.2.2.2.4	Radiation dose levels in the vicinity of controls and adjustments of the x ray accessory apparatus used during normal operation shall not exceed 0.25 mSv/hr (25 mrem/hr) to the extremities or 0.025 mSv/hr (2.5 mrem/hr) to the whole body.	X	X	X	X	X		X	
11.03.02.075	ANSI/HPS N43.2 - 2001	6.2.2.3.2	The inherent shielding of the chamber/enclosure walls shall be sufficient to limit the dose rate in all regions 5 cm from its outer surface to 0.0025 mSv/hr (0.25 mrem/hr) during normal operation.	X	X	X	X	X		X	

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11.03.03.019	10 CFR 835	Sub.E.835.402(b)	(b) External dose monitoring programs implemented to demonstrate compliance 835.402(a) shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part and shall be: (1)Accredited, or excepted from accreditation, in accordance with the DOE Laboratory Accreditation Program for Personnel Dosimetry; or (2)Determined by the Secretarial Officer responsible for environment, safety and health matters to have performance substantially equivalent to that of programs accredited under the DOE Laboratory Accreditation Program for Personnel Dosimetry.	X	X	X	X	X		X	
11.03.03.020	10 CFR 835	Sub.E.835.402(d)	(d) Internal dose monitoring programs implemented to demonstrate compliance with 835.402(c) shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part and shall be: (1)Accredited, or excepted from accreditation, in accordance with the DOE Laboratory Accreditation Program for Radiobioassay; or (2)Determined by the Secretarial Officer responsible for environment, safety and health matters to have performance substantially equivalent to that of programs accredited under the DOE Laboratory Accreditation Program for Radiobioassay.	X	X	X	X	X		X	
11.03.04.024	10 CFR 835	Sub.A.835.4	Unless otherwise specified, the quantities used in the records required by this part shall be clearly indicated in special units of curie, rad, roentgen, or rem, including multiples and subdivisions of these units, or other conventional units, such as, dpm, dpm/100 cm² or mass units. The SI units, becquerel (Bq), gray (Gy), and sievert (Sv), may be provided parenthetically for reference with scientific standards.	X	X	X	X	X		X	
11.03.04.025	10 CFR 835	Sub.C.835.203(a)	(a) The total effective dose during a year shall be determined by summing the effective dose from external exposures and the committed effective dose from intakes during the year.	X	X	X	X	X		X	
11.03.04.026	10 CFR 835	Sub.C.835.203(b)	(b) Determinations of the effective dose shall be made using the radiation and tissue weighting factor values provided in 835.2.	X	X	X	X	X		X	
11.03.04.027	10 CFR 835	Sub.C.835.205(a)	(a) Non-uniform exposures of the skin from X-rays, beta radiation, and/or radioactive material on the skin are to be assessed as specified in this section.	X	X	X	X	X		X	

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11.03.04.028	10 CFR 835	Sub.C.835.205(b)	(b) For purposes of demonstrating compliance with 835.202(a)(4), assessments shall be conducted as follows: (1) Area of skin irradiated is 100 cm² or more. The non-uniform equivalent dose received during the year shall be averaged over the 100 cm² of the skin receiving the maximum dose, added to any uniform equivalent dose also received by the skin, and recorded as the equivalent dose to any extremity or skin for the year. (2) Area of skin irradiated is 10 cm² or more, but is less than 100 cm². The non-uniform equivalent dose (H) to the irradiated area received during the year shall be added to any uniform equivalent dose also received by the skin and recorded as the equivalent dose to any extremity or skin for the year. H is the equivalent dose averaged over the 1 cm² of skin receiving the maximum absorbed dose, D, reduced by the fraction f, which is the irradiated area in cm² divided by 100 cm² (i.e., H = fD). In no case shall a value of f less than 0.1 be used. (3) Area of skin irradiated is less than 10 cm². The non-uniform equivalent dose shall be averaged over the 1 cm² of skin receiving the maximum dose. This equivalent dose shall: (i) Be recorded in the individual's occupational exposure history as a special entry; and (ii) Not be added to any other equivalent dose to any extremity or skin for the year.	X	X	X	X	X		X	
11.04.01.064	ANSI N43.3 - 1993	5.1(b)	A shielded installation shall conform with all of the following applicable requirements:	X	X	X	X	X		X	
11.04.01.065	ANSI N43.3 - 1993	5.1.1	The source of radiation and all objects exposed thereto are within a permanent enclosure within which no person is permitted to remain during irradiation.	X	X	X	X	X		X	
11.04.01.066	ANSI N43.3 - 1993	5.1.2	Interlocks shall be provided to prevent personnel access to the enclosure during irradiation (see 7.5.2).	X	X	X	X	X		X	
11.04.01.067	ANSI N43.3 - 1993	5.1.3	Audible or visible warning signals (preferably of the rotating beacon type) shall be provided within the enclosure.	X	X	X	X	X		X	
11.04.01.068	ANSI N43.3 - 1993	5.1.3.1	The visible signal shall be activated where radiation exposure rate exceed 100mR/hr in the exposure area and shall remain actuated during the entire exposure duration	X	X	X	X	X		X	
11.04.01.070	ANSI N43.3 - 1993	5.1.3.2 (i)	The audible signal shall be activated if an interlocked access to the exposure area is opened and radiation exposure rate exceed 100mR/hr.	X	X	X	X	X		X	
11.04.01.071	ANSI N43.3 - 1993	5.1.3.2 (ii)	The signal shall be audible to the operator of the radiation source and the person entering the exposure area.	X	X	X	X	X		X	

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				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.04.01.072	ANSI N43.3 - 1993	5.1.3.2 (iii)	The audible signal shall be frequency or capable of producing a sound pressure level that can be heard over background noise. Specifications for audible signals may be found in ANSI N2.3.	X	X	X	X	X		X	
11.04.01.073	ANSI N43.3 - 1993	5.1.3.3	For installations using x-ray equipment, the following recommendations may be used instead of 5.1.3. Each personnel access to the exposure room shall have a minimum of two interlocks. One, but not both, of the required interlocks shall be such that door opening results in physical disconnection of the energy supply circuit to the high voltage generator, and this disconnection shall not be dependent upon any moving part other than the door.	X	X	X	X	X		X	
11.04.01.074	ANSI N43.3 - 1993	5.1.5	Installations using high intensity x-ray or gamma ray sources that produce radiation levels in excess of 500 R in 1 hour at 3 feet (1 meter) from the radiation source shall employ audible and visible warning signals. This requirement does not apply to installations in which personnel access into the high radiation area is not possible.	X	X	X	X	X		X	
11.04.01.075	ANSI N43.3 - 1993	5.1.5.1 (i)	Both signals shall actuate a minimum of 20 seconds immediately before irradiation can be started.	X	X	X	X	X		X	
11.04.01.076	ANSI N43.3 - 1993	5.1.5.1 (ii)	The visible signal shall remain on throughout the exposure period. The audible signal need not remain on during the exposure period but shall be actuated if an interlocked access to the exposure area is opened and the radiation exposure rate exceeds 100 mR/hr.	X	X	X	X	X		X	
11.04.01.077	ANSI N43.3 - 1993	5.1.5.1 (iii)	The audible signal shall be of a frequency or capable of producing a sound pressure level that can be heard over background noise. Specifications for audible signals may be found in ANSI N2.3.	X	X	X	X	X		X	
11.04.01.083	ANSI N43.3 - 1993	5.1.8 (i)	The dose equivalent at any accessible non-controlled area, 1 foot (30 cm) from the outside surface of the enclosure shall not exceed 2 mrem in any 1 hour.	X	X	X	X	X		X	
11.04.01.084	ANSI N43.3 - 1993	5.1.8 (ii)	For electrically produced radiation, dose equivalent limits shall be met for any device Intended for use in the enclosure and operating at maximum beam current and voltage for continuous operation.	X	X	X	X	X		X	
11.04.01.085	ANSI N43.3 - 1993	5.1.8 (iii)	No radiation beam limiting or collimating devices or filters shall be used during tests to determine shield adequacy unless these devices are normally attached to the source housing or x-ray tube assembly during use.	X	X	X	X	X		X	
11.04.01.086	ANSI N43.3 - 1993	5.1.8 (iv)	The beam direction shall be positioned and oriented so that the highest exposure rate will be encountered in the area under evaluation provided that such positioning and orientation will serve a practical purpose in normal use.	X	X	X	X	X		X	
11.04.01.087	ANSI N43.3 - 1993	5.2 (i)	An Installation shall be so classified when it conforms with all of the requirements of 5.2.1 or 5.2.2. The design of an unattended installation shall assure that personnel in the area are not exposed to doses exceeding 100 mrem per year.	X	X	X	X	X		X	

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11.04.01.088	ANSI N43.3 - 1993	5.2.1.1	The source of radiation shall be installed in a single purpose, shielded device that complies with the provisions of ANSI N43.8.	X	X	X	X	X		X	
11.04.01.090	ANSI N43.3 - 1993	5.2.1.3	Gauging devices in which it is usable to insert any part of the body into the primary radiation beam shall be posted with a warning sign(s) alerting personnel to a radiation beam in the air gap. The sign(s) shall be visible from the normal avenues of approach to the gauging device.	X	X	X	X	X		X	
11.04.01.091	ANSI N43.3 - 1993	5.2.2.1	The source of radiation shall be contained in a single-purpose, shielded device. If the device is equipped with a shutter, or other absorber, so that the primary radiation beam can be reduced in magnitude, the closed and open position be easily identified. X-ray machines shall have a visual warning signal when x-rays are produced that is visible to persons approaching the x-ray beam.	X	X	X	X	X		X	
11.04.01.092	ANSI N43.3 - 1993	5.2.2.2	The dose equivalent at any accessible area 1 foot (30 cm) from the outside surface of the device not exceed 2 mrem in any 1 hour when the device is in its normal operating condition and occupancy in the vicinity of the device shall be limited so that the dose equivalent to an individual in any one year shall not exceed 100 mrem.	X	X	X	X	X		X	
11.04.01.093	ANSI N43.3 - 1993	5.2.2.4	Access panels opening into areas with exposure levels exceeding 2 mrem in any 1 hour shall be locked or secured with tamper resistant fasteners.	X	X	X	X	X		X	
11.04.01.094	ANSI N43.3 - 1993	5.3	An open installation Is one which, due to operational requirements or temporary needs, cannot be provided with the inherent degree of protection specified for either the shielded or unattended installations. An installation shall be so classified when it conforms with all of the following requirements.	X	X	X	X	X		X	
11.04.01.095	ANSI N43.3 - 1993	5.3.2	The high radiation area shall be kept under constant surveillance by a trained operator who is knowledgeable in the safe operation of the source and who will prevent access to areas In excess of 100 mrem in any 1 hour. No person should remain in the area during irradiation.	X	X	X	X	X		X	
11.04.01.096	ANSI N43.3 - 1993	5.3.4	The radiation source and equipment essential to the use of the source shall be inaccessible to unauthorized use, tampering or removal. This shall be accomplished by the attendance of a qualified operator or by other positive means such as locked enclosures.	X	X	X	X	X		X	
11.04.01.097	ANSI N43.3 - 1993	7.5 2	All doors and panels opening into a high radiation area (except those that can be opened or removed only with tools) shall be equipped with a failsafe interlock or a device that shall prevent irradiation unless the door or panel is closed and shall either cause the level of radiation to be reduced below 100 mrem In any 1 hour or shall cause a visual and audible alarm signal to energize upon entry Into the area. Refer to NCRP Report 88 (see the bibliography for more information on this publication) for a more complete discussion on Interlocks and radiation alarms.	X	X	X	X	X		X	

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11.04.01.098	ANSI N43.3 - 1993	7.5.3	If the exposure of any radiation source has been interrupted by the opening of a door or panel to an installation, it shall not be possible to resume operation by merely closing the door or panel. In addition, to resume operation it shall be necessary to manually re-energize a suitable device located on or near the control panel. The interior shall be checked for personnel prior to resuming radiation exposure.	X	X	X	X	X		X	
11.04.01.100	ANSI N43.3 - 1993	9.2.5	All safety features such as shutters, warning lights, and interlocks shall be tested at least every 6 months for reliable performance.	X	X	X	X	X		X	
11.04.01.101	ANSI N43.3 - 1993	9.3.1.1	Since safe operation is based on normal operating conditions specified in the applicable radiation protection survey report, the equipment shall be operated only within the indicated limits.	X	X	X	X	X		X	
11.04.01.104	ANSI N43.3 - 1993	9.3.3.1.1	The operator of radiation sources shall coordinate the planned operation with the area supervisor so that personnel are made aware of the potential radiation hazards.	X	X	X	X	X		X	
11.04.01.105	ANSI N43.3 - 1993	9.3.3.1.4	The operator of radiation sources shall prevent unauthorized access to the controlled area and the high radiation area.	X	X	X	X	X		X	
11.04.01.106	ANSI N43.3 - 1993	9.3.3.1.5	When an x-ray system is left unattended, the control console shall be locked and the key removed to prevent unauthorized use. Whenever a radionuclide source is left unattended, the source shall be locked in the exposure device or source housing to prevent unauthorized use. The exposure device or source housing shall be secured to prevent unauthorized access and removal or theft of the device.	X	X	X	X	X		X	
11.04.01.107	ANSI N43.3 - 1993	9.3.3.2.4	The operator shall perform a visual check of the controlled area to assure it is free of all unauthorized personnel immediately prior to activating or exposing the radiation source. The operator shall be the last person to exit the area.	X	X	X	X	X		X	
11.04.01.108	ANSI N43.3 - 1993	9.3.3.2.5	Surveillance of the exposure area shall be maintained during operation.	X	X	X	X	X		X	
11.04.01.195	ANSI N43.3 - 1993	5.1.5.2	Effective means shall be provided within the enclosure for preventing or quickly interrupting the irradiation. The use and function of the device used shall be clearly labeled. The device shall be readily accessible.	X	X	X	X	X		X	
11.04.01.196	ANSI N43.3 - 1993	5.1.5.2.1	Once interrupted, irradiation shall not be able to be resumed unless the switch within the exposure area Is reset and the operator control is reset.	X	X	X	X	X		X	
11.04.01.198	10 CFR 835	Sub.F.835.501(a)	(a) Personnel entry control shall be maintained for each radiological area.	X	X	X	X	X		X	
11.04.01.199	10 CFR 835	Sub.F.835.501(b)	(b) The degree of control shall be commensurate with existing and potential radiological hazards within the area.	X	X	X	X	X		X	

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11.04.01.200	10 CFR 835	Sub.F.835.501(c)	(c) One or more of the following methods shall be used to ensure control: (1)Signs and barricades; (2)Control devices on entrances; (3)Conspicuous visual and/or audible alarms; (4)Locked entrance ways; or (5)Administrative controls.	X	X	X	X	X		X	
11.04.01.201	10 CFR 835	Sub.F.835.501(d)	(d) Written authorizations shall be required to control entry into and perform work within radiological areas. These authorizations shall specify radiation protection measures commensurate with the existing and potential hazards.	X	X	X	X	X		X	
11.04.01.202	10 CFR 835	Sub.F.835.501(e)	(e) No control(s) shall be installed at any radiological area exit that would prevent rapid evacuation of personnel under emergency conditions.	X	X	X	X	X		X	
11.04.01.203	10 CFR 835	Sub.F.835.502(a)	(a) The following measures shall be implemented for each entry into a high radiation area: (1) The area shall be monitored as necessary during access to determine the exposure rates to which the individuals are exposed; and (2) Each individual shall be monitored by a supplemental dosimetry device or other means capable of providing an immediate estimate of the individual's integrated equivalent dose to the whole body during the entry.	X	X	X	X	X		X	
11.04.01.204	10 CFR 835	Sub.F.835.502(b)	(b) Physical controls. One or more of the following features shall be used for each entrance or access point to a high radiation area where radiation levels exist such that an individual could exceed an equivalent dose to the whole body of 1 rem (0.01 sievert) in any one hour at 30 centimeters from the source or from any surface that the radiation penetrates: (1) A control device that prevents entry to the area when high radiation levels exist or upon entry causes the radiation level to be reduced below that level defining a high radiation area; (2) A device that functions automatically to prevent use or operation of the radiation source or field while individuals are in the area; (3) A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; (4) Entryways that are locked. During periods when access to the area is required, positive control over each entry is maintained; (5) Continuous direct or electronic surveillance that is capable of preventing unauthorized entry; (6) A control device that will automatically generate audible and visual alarm signals to alert personnel in the area before use or operation of the radiation source and in sufficient time to permit evacuation of the area or activation of a secondary control device that will prevent use or operation of the source.	X	X	X	X	X		X	

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11.04.01.207	10 CFR 835	Sub.G.835.601(b)	(b) Signs required by this subpart shall be clearly and conspicuously posted and may include radiological protection instructions.	X	X	X	X	X		X	
11.04.01.208	10 CFR 835	Sub.G.835.602(a)	(a) Each access point to a controlled area (as defined at 835.2) shall be posted whenever radiological areas or radioactive material areas exist in the area. Individuals who enter only controlled areas without entering radiological areas or radioactive material areas are not expected to receive a total effective dose of more than 0.1 rem (0.001 sievert) in a year.	X	X	X	X	X		X	
11.04.01.209	10 CFR 835	Sub.G.835.602(b)	(b) Signs used for this purpose may be selected by the contractor to avoid conflict with local security requirements.	X	X	X	X	X		X	
11.04.01.210	10 CFR 835	Sub.G.835.603	Each access point to radiological areas and radioactive material areas (as defined at 835.2) shall be posted with conspicuous signs bearing the wording provided in this section. (a)Radiation area. The words "Caution, Radiation Area" shall be posted at each radiation area. (b)High radiation area. The words "Caution, High Radiation Area" or "Danger, High Radiation Area" shall be posted at each high radiation area. (c)Very high radiation area. The words "Grave Danger, Very High Radiation Area" shall be posted at each very high radiation area. (d)Airborne radioactivity area. The words "Caution, Airborne Radioactivity Area" or "Danger, Airborne Radioactivity Area" shall be posted at each airborne radioactivity area. (e)Contamination area. The words "Caution, Contamination Area" shall be posted at each contamination area. (f)High contamination area. The words "Caution, High Contamination Area" or "Danger, High Contamination Area" shall be posted at each high contamination area. (g)Radioactive material area. The words "Caution, Radioactive Material(s)" shall be posted at each radioactive material area.	X	X	X	X	X		X	
11.04.01.211	10 CFR 835	Sub.G.835.604(a)	(a) Areas may be excepted from the posting requirements of 835.603 for periods of less than 8 continuous hours when placed under continuous observation and control of an individual knowledgeable of, and empowered to implement, required access and exposure control measures.	X	X	X	X	X		X	
11.04.01.212	10 CFR 835	Sub.G.835.604(b)	(b) Areas may be excepted from the radioactive material area posting requirements of 835.603(g) when: (1)Posted in accordance with 835.603(a) through (f); or (2)Each item or container of radioactive material is labeled in accordance with this subpart such that individuals entering the area are made aware of the hazard; or (3)The radioactive material of concern consists solely of structures or installed components which have been activated (i.e., such as by being exposed to neutron radiation or particles produced by an accelerator).	X	X	X	X	X		X	

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				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.04.01.213	ANSI/HPS N43.2 - 2001	6.1.1.5	Supervision. Each radiation area shall be under the general supervision of a Radiation Safety Officer and under continuous supervision by an operator during operation. Note that continuous supervision may not require continuous personnel presence, but control over access to the radiation area is to be maintained. For example, continuous supervision may involve personnel presence, door locks, entry monitors, or other engineered solutions.	X	X	X	X	X		X	
11.04.01.214	ANSI/HPS N43.2 - 2001	6.1.2.3	Identifying sign. Each x-ray diffraction and fluorescence analysis equipment location shall be identified by an appropriate and easily recognizable warning sign posted at each entrance. For example, a black and yellow sign with the following words could be used: Warning: X-rays In Use Contact _____ For Access	X	X	X	X	X		X	
11.04.01.215	ANSI/HPS N43.2 - 2001	6.2.2.1.3	Warning lights or devices of failsafe design labeled with the words "X RAYS ON", or other words having similar meaning, shall be located: (a) near any switch which activates the high voltage to energize an x-ray tube; (b) in a conspicuous location near the radiation source housing and radiation beam(s) and visible from all instrument access areas. Such lights or devices shall activate when the x-ray tube is energized.	X	X	X	X	X		X	
11.04.01.216	ANSI/HPS N43.2 - 2001	6.2.2.1.4	Each shutter shall be provided with a “shutter open” indication (e.g. warning light or device) of fail-safe design. The indicator shall activate when the “shutter open” signal is initiated.	X	X	X	X	X		X	
11.04.01.217	ANSI/HPS N43.2 - 2001	6.2.2.1.5	A label bearing the conventional radiation symbol and the words, CAUTION: THIS EQUIPMENT PRODUCES X-RAYS WHEN ENERGIZED, or other words having similar meaning, shall be attached near any switch which energizes an x-ray tube. Additional wording should include: TO BE OPERATED ONLY BY QUALIFIED PERSONNEL	X	X	X	X	X		X	
11.04.01.218	ANSI/HPS N43.2 - 2001	6.2.2.3.1	The radiation source, beam paths, sample, detector and/or other devices (e.g. analyzing crystal, filters, etc.) shall be enclosed in a chamber, coupled chambers, beam pipes, whole system enclosure, etc. that cannot be entered by any part of the body during normal operation. (Enclosed Beam System)	X	X	X	X	X		X	
11.04.01.219	ANSI/HPS N43.2 - 2001	6.2.2.3.5	If there is more than one port in the radiation source housing or more than one radiation source, all requirements under 6.2.2.3 must be satisfied for each port in every source housing associated with the system. (Enclosed Beam System) Note: The other four requirements under 6.2.2.3 are provided as S/RID requirements 11.02.01.081, 11.02.01.082, 11.03.02.075 and 11.04.01.218 in this Functional Area.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.04.01.220	ANSI/HPS N43.2 - 2001	7.4.2	No operation involving removal of cover shielding materials or tube housings or modifications to shutters, collimators or beam stops shall be performed without ascertaining that the tube is off and will remain off until safe conditions have be restored. The x-ray source power switch, rather than safety interlocks, shall be used for routine shutdown in preparation for repairs	X	X	X	X	X		X	
11.04.01.221	ANSI/HPS N43.2 - 2001	7.4.3	No x-ray tube shall be operated without a suitably shielded housing to restrict the primary or secondary radiation to a well defined beam.	X	X	X	X	X		X	
11.04.01.222	ANSI/HPS N43.2 - 2001	7.4.6	If an alignment procedure results in increasing the dose rate in any area so that the usual designation of that area no longer applies, the RCO shall erect temporary barriers and warning signs as required to create a new controlled area and shall keep the area under surveillance until normal operation has been restored.	X	X	X	X	X		X	
11.04.01.223	ANSI/HPS N43.2 - 2001	7.4.8	After reassembly, the x-ray system shall be checked by the RCO and the custodian. Particular attention should be given to the alignment of shielding, shutters and collimators. Lead parts should be inspected for damage, distortion, or corrosion which could result in radiation leakage and should be mounted in such a way that they will not cold-flow because of their own weight.	X	X	X	X	X		X	
11.04.01.224	ANSI/HPS N43.2 - 2001	7.5.1	Any device for use with an x-ray tube shall be regarded as a nonstandard accessory unless it is a compatible component manufactured specifically to fit the radiation source housing used. It is recommended that no new accessory be aligned or operated until the manufacturer's procedures have been reviewed by the person in charge and a radiation survey has been carried out.	X	X	X	X	X		X	
11.04.01.225	ANSI/HPS N43.2 - 2001	7.5.2	Nonstandard accessories shall not be aligned or operated by the equipment users until procedures have been approved and a radiation survey carried out. Manufacturer's personnel performing work on nonstandard accessories (e.g. installation, maintenance, etc.) shall follow safety procedures specific to this type of operation	X	X	X	X	X		X	
11.04.01.226	ANSI/HPS N43.2 - 2001	7.6.2	The location of x-ray tubes in relation to windows shall be considered carefully. Any window within the radiation emission cone of the source may create a local radiation or high radiation area. If the x-ray source is adjustable, efforts shall be taken to ensure safe operation over the full range of adjustment.	X	X	X	X	X		X	
11.04.01.227	ANSI/HPS N43.2 - 2001	7.6.3	If windows cannot be positioned to prevent radiation emission because of technical or operational reasons, lead glass covers or similar material may be used to reduce radiation levels. Covers shall be affixed so they cannot be accidentally knocked aside. A survey shall be performed to verify the effectiveness of the covers under all anticipated operating conditions.	X	X	X	X	X		X	

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S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
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11.04.02.001	ANSI N43.3 - 1993	5.1.10.1	Cabinet x-ray systems: Certified cabinet x-ray systems shall comply with the provisions of 21 CFR 1020.40. Cabinet x-ray systems that are not covered by 21 CFR 1020.40 shall comply with the requirements of the exempt shielded Installation classification.	X	X	X	X	X		X	
11.05.01.060	10 CFR 835	Sub.E.835.405(a)	(a) If packages containing quantities of radioactive material in excess of a Type A quantity (as defined at 10 CFR 71.4) are expected to be received from radioactive material transportation, arrangements shall be made to either: (1)Take possession of the package when the carrier offers it for delivery; or (2)Receive notification as soon as practicable after arrival of the package at the carrier's terminal and to take possession of the package expeditiously after receiving such notification.	X	X	X	X	X		X	
11.05.01.061	10 CFR 835	Sub.E.835.405(b)	(b) Upon receipt from radioactive material transportation, external surfaces of packages known to contain radioactive material shall be monitored if the package: (1)Is labeled with a Radioactive White I, Yellow II, or Yellow III label (as specified at 49 CFR 172.403 and 172.436-440); or (2)Has been transported as low specific activity material (as defined at 10 CFR 71.4) on an exclusive use vehicle (as defined at 10 CFR 71.4); or (3)Has evidence of degradation, such as packages that are crushed, wet, or damaged.	X	X	X	X	X		X	
11.05.01.062	10 CFR 835	Sub.E.835.405(c)	(c) The monitoring required by paragraph (b) of this section shall include: (1) Measurements of removable contamination levels, unless the package contains only special form (as defined at 10 CFR 71.4) or gaseous radioactive material; and (2) Measurements of the radiation levels, if the package contains a Type B quantity (as defined at 10 CFR 71.4) of radioactive material. Note: Paragraph (b) of section 405 is provided as S/RID requirement 11.05.01.061 in this Functional Area.	X	X	X	X	X		X	
11.05.01.063	10 CFR 835	Sub.E.835.405(d)	(d) The monitoring required by paragraph (b) of this section shall be completed as soon as practicable following receipt of the package, but not later than 8 hours after the beginning of the working day following receipt of the package. Note: Paragraph (b) of section 405 is provided as S/RID requirement 11.05.01.061 in this Functional Area.	X	X	X	X	X		X	
11.05.01.064	10 CFR 835	Sub.G.835.601(a)	(a) Except as otherwise provided in this subpart, postings and labels required by this subpart shall include the standard radiation warning trefoil in black or magenta imposed upon a yellow background.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.05.01.065	10 CFR 835	Sub.G.835.604(c)	(c) Areas containing only packages received from radioactive material transportation labeled and in non-degraded condition need not be posted in accordance with 835.603 until the packages are monitored in accordance with 835.405.	X	X	X	X	X		X	
11.05.01.066	10 CFR 835	Sub.G.835.605	Except as provided in 835.606, each item or container of radioactive material shall bear a durable, clearly visible label bearing the standard radiation warning trefoil and the words "Caution, Radioactive Material" or "Danger, Radioactive Material." The label shall also provide sufficient information to permit individuals handling, using, or working in the vicinity of the items or containers to take precautions to avoid or control exposures.	X	X	X	X	X		X	
11.05.01.067	10 CFR 835	Sub.G.835.606(a)	(a) Items and containers may be excepted from the radioactive material labeling requirements of 835.605 when: (1) Used, handled, or stored in areas posted and controlled in accordance with this subpart and sufficient information is provided to permit individuals to take precautions to avoid or control exposures; or (2) The quantity of radioactive material is less than one tenth of the values specified in appendix E of this part and less than 0.1 Ci; or (3) Packaged, labeled, and marked in accordance with the regulations of the Department of Transportation or DOE Orders governing radioactive material transportation; or (4) Inaccessible, or accessible only to individuals authorized to handle or use them, or to work in the vicinity; or (5) Installed in manufacturing, process, or other equipment, such as reactor components, piping, and tanks; or (6) The radioactive material consists solely of nuclear weapons or their components. Note: 1. For Appendix E, see the Source Document.	X	X	X	X	X		X	
11.05.01.068	10 CFR 835	Sub.G.835.606(b)	(b) Radioactive material labels applied to sealed radioactive sources may be excepted from the color specifications of 835.601(a).	X	X	X	X	X		X	
11.05.01.069	10 CFR 835	Sub.H.835.704(f)	(f) Records shall be maintained as necessary to demonstrate compliance with the requirements of 835.1201 and 835.1202 for sealed radioactive source control, inventory, and source leak tests.	X	X	X	X	X		X	
11.05.01.070	10 CFR 835	Sub.M.835.1201	Sealed radioactive sources shall be used, handled, and stored in a manner commensurate with the hazards associated with operations involving the sources.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.05.01.071	10 CFR 835	Sub.M.835.1202 (a)	(a)Each accountable sealed radioactive source shall be inventoried at intervals not to exceed six months. This inventory shall: (1)Establish the physical location of each accountable sealed radioactive source; (2)Verify the presence and adequacy of associated postings and labels; and (3)Establish the adequacy of storage locations, containers, and devices.	X	X	X	X	X		X	
11.05.01.072	10 CFR 835	Sub.M.835.1202 (b)	(b) Except for sealed radioactive sources consisting solely of gaseous radioactive material or tritium, each accountable sealed radioactive source shall be subject to a source leak test upon receipt, when damage is suspected, and at intervals not to exceed six months. Source leak tests shall be capable of detecting radioactive material leakage equal to or exceeding 0.005 µCi.	X	X	X	X	X		X	
11.05.01.073	10 CFR 835	Sub.M.835.1202 (c)	(c)Notwithstanding the requirements of paragraph (b) of this section, an accountable sealed radioactive source is not subject to periodic source leak testing if that source has been removed from service. Such sources shall be stored in a controlled location, subject to periodic inventory as required by paragraph (a) of this section, and subject to source leak testing prior to being returned to service. Note: Paragraph (b) of section 1202 is provided as S/RID requirement 11.05.01.072 in this Functional Area.	X	X	X	X	X		X	
11.05.01.074	10 CFR 835	Sub.M.835.1202 (d)	(d)Notwithstanding the requirements of paragraphs (a) and (b) of this section, an accountable sealed radioactive source is not subject to periodic inventory and source leak testing if that source is located in an area that is unsafe for human entry or otherwise inaccessible. Note: Paragraphs (a) and (b) of section 1202 are provided as S/RID requirements 11.05.01.071 and 11.05.01.072 in this Functional Area.	X	X	X	X	X		X	
11.05.01.075	10 CFR 835	Sub.M.835.1202 (e)	(e)An accountable sealed radioactive source found to be leaking radioactive material shall be controlled in a manner that minimizes the spread of radioactive contamination.	X	X	X	X	X		X	
11.05.01.076	10 CFR 835	835.App E	The data presented in appendix E are to be used for identifying accountable sealed radioactive sources and radioactive material areas as those terms are defined at 835.2(a), establishing the need for radioactive material area posting in accordance with 835.603(g), and establishing the need for radioactive material labeling in accordance with 835.605. Note: 1. For Appendix E, see the Source Document.	X	X	X	X	X		X	

TABLE 1 - S/RID FUNCTIONAL AREA 11 (RADIATION PROTECTION) REQUIREMENTS

S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.05.01.077	10 CFR 835	Sub.E.835.405(e)	Monitoring pursuant to 835.405(b) is not required for packages transported on a DOE site which have remained under the continuous observation and control of a DOE employee or DOE contractor employee who is knowledgeable of and implements required exposure control measures.	X	X	X	X	X		X	
11.05.02.051	10 CFR 835	Sub.L.835.1101 (a)	(a) Except as provided in paragraphs (b) and (c) of this section, material and equipment in contamination areas, high contamination areas, and airborne radioactivity areas shall not be released to a controlled area if: (1)Removable surface contamination levels on accessible surfaces exceed the removable surface contamination values specified in appendix D of this part; or (2)Prior use suggests that the removable surface contamination levels on inaccessible surfaces are likely to exceed the removable surface contamination values specified in appendix D of this part. Notes: 1. Paragraphs (b) and (c) of section 1101 are provided as S/RID requirements 11.05.02.052 and 11.05.02.053 in this Functional Area. 2. For Appendix D, see the Source Document.	X	X	X	X	X		X	
11.05.02.052	10 CFR 835	Sub.L.835.1101 (b)	(b) Material and equipment exceeding the removable surface contamination values specified in appendix D of this part may be conditionally released for movement on-site from one radiological area for immediate placement in another radiological area only if appropriate monitoring is performed and appropriate controls for the movement are established and exercised. Note: For Appendix D, see the Source Document.	X	X	X	X	X		X	
11.05.02.053	10 CFR 835	Sub.L.835.1101 (c)	(c) Material and equipment with fixed contamination levels that exceed the total surface contamination values specified in appendix D of this part may be released for use in controlled areas outside of radiological areas only under the following conditions: (1)Removable surface contamination levels are below the removable surface contamination values specified in appendix D of this part; and (2)The material or equipment is routinely monitored and clearly marked or labeled to alert personnel of the contaminated status. Note: For Appendix D, see the Source Document.	X	X	X	X	X		X	
11.06.01.128	10 CFR 835	Sub.L.835.1102 (a)	(a) Appropriate controls shall be maintained and verified which prevent the inadvertent transfer of removable contamination to locations outside of radiological areas under normal operating conditions.	X	X	X	X	X		X	

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S/RID Requirement Number	Source Document	Source Document Reqt Number	Requirement Text	SRR Applicability						Phase I Compliance	
				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.06.01.129	10 CFR 835	Sub.L.835.1102 (b)	(b) Any area in which contamination levels exceed the values specified in appendix D of this part shall be controlled in a manner commensurate with the physical and chemical characteristics of the contaminant, the radionuclides present, and the fixed and removable surface contamination levels. Note: For Appendix D, see the Source Document.	X	X	X	X	X		X	
11.06.01.130	10 CFR 835	Sub.L.835.1102 (c)	(c) Areas accessible to individuals where the measured total surface contamination levels exceed, but the removable surface contamination levels are less than, corresponding surface contamination values specified in appendix D of this part, shall be controlled as follows when located outside of radiological areas: (1)The area shall be routinely monitored to ensure the removable surface contamination level remains below the removable surface contamination values specified in appendix D of this part; and (2)The area shall be conspicuously marked to warn individuals of the contaminated status. Note: For Appendix D, see the Source Document.	X	X	X	X	X		X	
11.06.01.131	10 CFR 835	Sub.L.835.1102 (d)	(d) Individuals exiting contamination, high contamination, or airborne radioactivity areas shall be monitored, as appropriate, for the presence of surface contamination.	X	X	X	X	X		X	
11.06.01.132	10 CFR 835	835.App D	The data presented in appendix D are to be used in identifying the need for posting of contamination and high contamination areas in accordance with 835.603(e) and (f) and identifying the need for surface contamination monitoring and control in accordance with 835.1101 and 1102. Note: For Appendix D, see the Source Document.	X	X	X	X	X		X	
11.08.01.010	ANSI N42.18 - 1980	5.4.10 (iv)	Systems where the concentration of radionuclides changes significantly between the sample point and detector, as in off-line particulate monitoring shall be tested by using radioactive material or known tracer such as dioctyl phthalate (DOP) to determine the loss in the sample lines.	X	X	X	X	X		X	
11.08.01.149	ANSI N43.3 - 1993	9.2.3	All maintenance and calibration shall be performed by trained personnel who are familiar with the equipment and the correct procedures to be followed. Calibration samples shall not be hand inserted into the area of the primary radiation beam unless the shutter is closed or the source is stored in its fully shielded condition.	X	X	X	X	X		X	
11.08.01.182	10 CFR 835	Sub.A.835.3(e)	(e) For those activities that are required by 835.102, 835.901(e), 835.1202(a), and 835.1202(b), the time interval to conduct these activities may be extended by a period not to exceed 30 days to accommodate scheduling needs.	X	X	X	X	X		X	

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				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.08.01.183	10 CFR 835	Sub.E.835.401(b)	(b) Instruments and equipment used for monitoring shall be: (1)Periodically maintained and calibrated on an established frequency; (2)Appropriate for the type(s), levels, and energies of the radiation(s) encountered; (3)Appropriate for existing environmental conditions; and (4)Routinely tested for operability.	X	X	X	X	X		X	
11.08.01.184	ANSI N323A - 1997	4.1.a	Precalibration shall include a visual examination of the instrument condition and a documentation of the instrument response, upon return from the field, by obtaining "as found" readings for one calibration point on each scale.	X	X	X	X	X		X	
11.08.01.185	ANSI N323A - 1997	4.1.b	"As found" readings shall be taken prior to any adjustments on the instrument, unless the instrument is returned in an inoperable condition.	X	X	X	X	X		X	
11.08.01.186	ANSI N323A - 1997	4.2.a	Calibration shall include adjustment and/or determination of new readings for each point selected on the scale.	X	X	X	X	X		X	
11.08.01.187	ANSI N323A - 1997	4.2.b	Electronic calibration shall be acceptable for some instrument ranges where calibration with a source is impractical, provided the electronic calibration is related to actual exposure data at one or more points.	X	X	X	X	X		X	
11.08.01.188	ANSI N323A - 1997	4.2.c	The following conditions shall be established prior to exposing the instrument to a source for adjustment and calibration: a) The meter shall be adjusted to zero or the point specified by the manufacturer. b) The batteries or power supply shall comply with the instrument manufacturer's specification. c) The instrument shall be turned on and allowed to stabilize as appropriate. d) Electronic adjustments such as high voltage shall be set either to the site specifications or to the manufacturer's specifications, as applicable. e) The effect of geotropism shall be known for the instrument, and this effect shall be taken into account during calibration.	X	X	X	X	X		X	
11.08.01.189	ANSI N323A - 1997	4.2.1.1.a	Linear readout instruments with a single calibration control for all scales shall be adjusted either at the point recommended by the manufacturer or at a point within the normal range of use. Instruments with calibration controls for each scale shall be adjusted on each scale. Note: If instruments have ranges that are not calibrated, a limited calibration tag that notes the limits of calibration shall be attached to the instrument. The same principles should be applied to microprocessor-controlled instruments.	X	X	X	X	X		X	

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11.08.01.190	ANSI N323A - 1997	4.2.1.1.b	After adjustment, the response of the instrument shall be checked near the end points of each scale (approximately 20% and 80% of full scale). Note: For microprocessor-based instruments that have been proven linear through type testing and/or acceptance testing, only one point on each scale or decade is required.	X	X	X	X	X		X	
11.08.01.191	ANSI N323A - 1997	4.2.1.1.c	Instrument readings shall be within ± l5% of conventionally true values (CTV) for the lower point and ± 10% of CTV for the upper point. Readings within ± 20% shall be acceptable if a calibration chart or graph is prepared and provided with the instrument.	X	X	X	X	X		X	
11.08.01.192	ANSI N323A - 1997	4.2.1.2.a	The instrument shall be adjusted for each scale according to the site specifications or the manufacturer's specifications. Alternatively, it shall be permissible to calibrate at points of particular importance to the user if the reasons for the change and the impact on accuracy are documented and justified.	X	X	X	X	X		X	
11.08.01.193	ANSI N323A - 1997	4.2.1.2.b	After adjustment, calibration shall be checked at a minimum of one point on each decade. Instrument readings shall have a maximum deviation from the CTV of no more than 10% of the full decade value. If the display is not marked at intervals corresponding to ± 10% of the point (i.e., a calibration at a mark frequently does not have graduations to 10% in the next decade), it is permissible to use the spacing on the low side of the calibration point to estimate the calibration limit on the high side of the calibration point.	X	X	X	X	X		X	
11.08.01.194	ANSI N323A - 1997	4.2.1.3	Digital instruments shall be calibrated as in 4.2. l . l . Notes: 1. For microprocessor-based instruments that have been proven linear through type testing and/or acceptance testing, only one point on each scale or decade is required. 2. 4.2.1.1 as mentioned above are S/RID requirements 11.08.01.189 to 11.08.01.191 in this Functional Area.	X	X	X	X	X		X	
11.08.01.195	ANSI N323A - 1997	4.2.1.4.a	Instruments that integrate dose shall be checked at a minimum of two dose rates at approximately 20% and 80% of the stated dose rate range or as recommended by the manufacturer. Note: If the full instrument dose rate range is not intended for use, then the range acceptable for use shall be noted on the instrument.	X	X	X	X	X		X	
11.08.01.196	ANSI N323A - 1997	4.2.1.4.b	The integrations shall continue to a value sufficient to ensure a statistically valid reading that shall be within 15% of the CTV.	X	X	X	X	X		X	

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11.08.01.197	ANSI N323A - 1997	4.2.1.5	Instruments designed to read out in units of neutron dose equivalent or dose equivalent rate shall be calibrated as in 4.2. l .1 through 4.2.1.4; except that the calibration accuracy for ranges from 0-100 micro Sv/h or 0-100 micro Sv (0-10 mrem/h or 0-10 mrem) shall be ± 30% and the calibration accuracy for ranges from 100 micro Sv/h or 100 micro Sv (10 mrem/h or 10 mrem) and above shall be ± 20%. Notes: 1. 4.2.1.1 through 4.2.1.4 as mentioned above are S/RID requirements 11.08.01.189 to 11.08.01.196 in this Functional Area. 2. Greek symbol for micro has been translated and added to reflect the correct units of calibration accuracy ranges.	X	X	X	X	X		X	
11.08.01.198	ANSI N323A - 1997	4.2.1.6	Correction factors for beta dose/dose rate measurements shall be determined using either IS0 6980: 1994 sources for point sources and standard distributed sources (e.g., depleted uranium slabs), or transfer sources relatable to the IS0 6980: 1994 sources.	X	X	X	X	X		X	
11.08.01.199	ANSI N323A - 1997	4.2.1.7	Calibration of both the digital and the analog scales shall be performed.	X	X	X	X	X		X	
11.08.01.200	ANSI N323A - 1997	4.2.2.a	It shall be permissible to calibrate either the electronics and the detector together using radiation sources traceable to NIST, or the electronic package and the detector separately using an electronic pulser and radiation sources.	X	X	X	X	X		X	
11.08.01.201	ANSI N323A - 1997	4.2.2.b	The detector shall be calibrated with an energy that is less than or similar to beta energies in the field.	X	X	X	X	X		X	
11.08.01.202	ANSI N323A - 1997	4.2.2.c	Where the instrument is calibrated as an integral unit, a minimum of one point on each scale shall be calibrated up to 1000 Bq/100 square centimeter (approximately 60,000 dpm/100 square centimeter). Note: The superscripts and approximately sign have been translated.	X	X	X	X	X		X	
11.08.01.203	ANSI N323A - 1997	4.2.2.d	If each scale has a calibration potentiometer, the reading shall be adjusted to read the CTV at approximately 80% of full scale, and the reading at approximately 20% of full scale shall be observed.	X	X	X	X	X		X	
11.08.01.204	ANSI N323A - 1997	4.2.2.e	If only one calibration potentiometer is available, the reading shall be adjusted at mid-scale on one of the scales, and readings on the other scales shall be observed.	X	X	X	X	X		X	
11.08.01.205	ANSI N323A - 1997	4.2.2.f	Readings shall be within 20% of the CTV.	X	X	X	X	X		X	
11.08.01.206	ANSI N323A - 1997	4.2.2.g	Where the electronic package and detector are calibrated separately, the count rate meter shall be calibrated with the electronic pulser.	X	X	X	X	X		X	
11.08.01.207	ANSI N323A - 1997	4.2.2.h	The detector shall be calibrated radiologically with sources traceable to NIST.	X	X	X	X	X		X	

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				Nuclear HC-1,2,3	Radi-ological	High Hazard Chemical	Low Hazard Chemical	Other Industrial	Facility Specific	Common	Facility Specific
11.08.01.208	ANSI N323A - 1997	4.2.2.i	It shall be permissible for the probe and the count rate meters to be calibrated separately.	X	X	X	X	X		X	
11.08.01.209	ANSI N323A - 1997	4.2.2.j	The exchange of probes shall be permitted if the variation between combinations of units provided to a given location has been documented to be within 20% of the CTV.	X	X	X	X	X		X	
11.08.01.210	ANSI N323A - 1997	4.2.2.k	This shall be documented for all combinations of probe and count rate meter models and ranges.	X	X	X	X	X		X	
11.08.01.211	ANSI N323A - 1997	4.2.2.l	The range of acceptable count rates for a specific check source shall be documented.	X	X	X	X	X		X	
11.08.01.212	ANSI N323A - 1997	4.2.2.m	If the exchange of probes is permitted, the new detector shall respond within the same range of acceptable count rates as the previous probe using the same check source as used with the original probe.	X	X	X	X	X		X	
11.08.01.213	ANSI N323A - 1997	4.2.2.n	The counting efficiency or relationship (e.g., x cpm/dpm) shall be documented on the detector after each calibration, or on the instrument if the probes are not exchanged in the field.	X	X	X	X	X		X	
11.08.01.214	ANSI N323A - 1997	4.2.2.1	Digital readouts shall convey that the radiation level present exceeds the upper measurement level of the instrument in a manner described by the instrument manufacturer.	X	X	X	X	X		X	
11.08.01.215	ANSI N323A - 1997	4.2.2.2.a	All scintillation and air or gas proportional detectors shall be checked for light leaks or holes in the window material before calibration is initiated.	X	X	X	X	X		X	
11.08.01.216	ANSI N323A - 1997	4.2.2.2.b	A maximum acceptable background count rate shall be determined, documented, and used to test instruments prior to calibration.	X	X	X	X	X		X	
11.08.01.217	ANSI N323A - 1997	4.2.2.2.c	Counting efficiencies shall be determined with the radionuclide to be detected, if possible, or with a radionuclide with similar energy.	X	X	X	X	X		X	
11.08.01.218	ANSI N323A - 1997	4.2.3.1.a	Instruments shall be calibrated in a radiation field appropriate to the instrument.	X	X	X	X	X		X	
11.08.01.219	ANSI N323A - 1997	4.2.3.1.b	In some cases (such as special nuclear material monitors), a full calibration to the specific radiations and/or levels is not practical on a routine basis. For such applications, a full calibration shall be performed once and related to a controlled and reproducible geometry for subsequent special calibrations (i.e., source and test fixture).	X	X	X	X	X		X	
11.08.01.220	ANSI N323A - 1997	4.2.3.1.c	Overload response shall be tested as appropriate.	X	X	X	X	X		X	
11.08.01.221	ANSI N323A - 1997	4.2.3.1.d	The bases for the special calibration shall be documented and, where possible, should be traceable to NIST.	X	X	X	X	X		X	

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11.08.01.222	ANSI N323A - 1997	4.3.1.a	When an instrument is to be adjusted and calibrated for use only under special conditions that are outside the manufacturer's specifications (i.e., radiation energy, temperature and pressure, or source/detector geometry), a special-use identification label (or other means of identification) shall be attached, in addition to any required calibration labels, to indicate its applicability for this special use.	X	X	X	X	X		X	
11.08.01.223	ANSI N323A - 1997	4.3.1.b	If the instrument is also to be used within its design limits, the adjustments made during calibration shall be done under standard conditions (see Table 1); and instrument readings for the special conditions shall be corrected using correction factors obtained from appropriate evaluations of instrument performance. Note: For Table 1, see SRID Functional Area 00.	X	X	X	X	X		X	
11.08.01.224	ANSI N323A - 1997	4.3.1.c	The bases for the calibration to special conditions shall be documented.	X	X	X	X	X		X	
11.08.01.225	ANSI N323A - 1997	4.3.1.d	Determination of corrections for special conditions shall be performed only once, unless a) The instrument is modified or physically altered, or b) The special conditions are changed, or c) The normal calibration suggests that a change or deterioration has occurred in instrument performance.	X	X	X	X	X		X	
11.08.01.226	ANSI N323A - 1997	4.5.a	A record shall be maintained of all calibration, maintenance, repair, and modification data for each instrument.	X	X	X	X	X		X	
11.08.01.227	ANSI N323A - 1997	4.5.b	The record shall be dated and shall identify the individual performing the work.	X	X	X	X	X		X	
11.08.01.228	ANSI N323A - 1997	4.5.c	The record shall be filed with previous records on the same instrument and shall be readily retrievable.	X	X	X	X	X		X	
11.08.01.229	ANSI N323A - 1997	4.6.1	Each instrument shall be labeled with the following information: a) Date of most recent calibration b) Initials or other specific identifying mark of calibrator c) Date that primary calibration is again required d) Special-use or limited calibration label (if applicable) e) Serial number of the instrument or other unique identification number used by the facility to identify a specific instrument.	X	X	X	X	X		X	

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11.08.01.230	ANSI N323A - 1997	4.6.2	The following information shall be documented and made available to the user for each instrument: a) Energy correction factors, where appropriate. b) Graph or table of calibration factors, where necessary, for each type of radiation for which the instrument was calibrated. This should relate the scale reading to the units required if units are not provided on the scale. c) Instrument response to an identified check source (to be provided either by calibrator or user). d) Unusual or special use conditions or limitations, where appropriate.	X	X	X	X	X		X	
11.08.01.231	ANSI N323A - 1997	4.7.a	A comprehensive and readily available record system shall be maintained by the calibration facility.	X	X	X	X	X		X	
11.08.01.232	ANSI N323A - 1997	4.7.b	All records of data shall identify the individual who collected the data on which the record is based.	X	X	X	X	X		X	
11.08.01.233	ANSI N323A - 1997	4.7.c	The record system shall include at least the following: a) An inventory of all standards and calibration equipment. b) A full history and calibration data, including certificates, for all standards and applicable calibration equipment. c) All procedures used for providing calibration services. d) Routine quality control records. e) The results of all performance testing. f) Records of instrumentation for which a calibration service was provided, and the date that the calibration was performed including a description, sufficient for identification, of every item. The record system shall also include or reference a detailed report for that specific calibration. g) Copies of all calibration reports issued and/or all electronic records. h) Information essential to the analysis and reconstruction of the calibration of a specific item of instrumentation. i) Records detailing the education, experience, and training of all operating staff and supervisory personnel. j) A documented analysis of calibration uncertainties.	X	X	X	X	X		X	
11.08.01.234	ANSI N323A - 1997	4.8.a	To ensure proper operation of the instrument between calibrations, each instrument (with the exception of neutron instruments and high-dose equivalent rate photon instruments) shall be checked with a source during operation at least daily or prior to each intermittent use, whichever is less frequent.	X	X	X	X	X		X	
11.08.01.235	ANSI N323A - 1997	4.8.b	If at any time the instrument response to the source differs from the reference reading by more than ± 20% (for any photon instrument the reading should be at least ten times background), the instrument shall be returned to the calibration facility for calibration or for maintenance, repair, and recalibration, as required.	X	X	X	X	X		X	

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11.08.01.236	ANSI N323A - 1997	4.8.c	Reference readings shall be obtained for each instrument when exposed to a source in a constant and reproducible manner, either at the time that the instrument is received in the field or before its first use.	X	X	X	X	X		X	
11.08.01.237	ANSI N323A - 1997	4.8.d	Where it is shown that readings for a specific model of instrument fall within ± 20%, it shall be permissible to obtain generic reference readings for a given source. Note: A source response check may not be practical for some instruments, such as high-range instruments and neutron exposure rate instruments. In these cases, the facility should develop compensatory methods to demonstrate that the instrument is operable before use.	X	X	X	X	X		X	
11.08.01.238	ANSI N323A - 1997	5.1.a	Instruments shall be calibrated with appropriate standards that are traceable to NIST or its international equivalents.	X	X	X	X	X		X	
11.08.01.239	ANSI N323A - 1997	5.1.b	Working standards derived from secondary or tertiary standards shall be used and shall be compared at least annually against the secondary or tertiary standards.	X	X	X	X	X		X	
11.08.01.240	ANSI N323A - 1997	5.1.c	Calibrations of the reference radiation field or source shall be obtained in one of the following ways: a) By calibration of a user's transfer instrument with a national or secondary standard source, followed by evaluation of the user's reference source with the same transfer instrument. The transfer instrument shall have a reproducibility within 2% (one standard deviation). b) By comparison of the radiation field from a user's reference source with the radiation field from a national or secondary standard source in the same geometry, using a "transfer instrument" that has a reproducibility within 2% (one standard deviation). c) Where no national or secondary standard exists (as in the case of specific energies, unusual sources, or unusual source configuration), by establishment of a standard source or instrument with documented empirical and theoretical output or response characteristics.	X	X	X	X	X		X	

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11.08.01.241	ANSI N323A - 1997	5.3.a	Calibration standards shall be maintained through an ongoing measurement quality assurance program with NIST or an appropriate secondary laboratory. Laboratories may participate in a calibration accreditation program to demonstrate the competence of the calibration laboratory. Accreditation programs are run through the Conference of Radiation Control Program Directors (CRCPD), the Health Physics Society (HPS), and the National Voluntary Laboratory Accreditation Program (NVLAP). Whenever possible, laboratories should derive their calibration standards from national standards maintained by the National Institute of Standards and Technology (NIST), its international equivalents, or secondary standards maintained by other accredited laboratories. Direct comparison with national or secondary standards shall be undertaken when the measurement quality assurance program indicates that such actions are needed.	X	X	X	X	X		X	
11.08.01.242	ANSI N323A - 1997	5.3.b	Quality control procedures shall be in place to ensure that a working relationship is maintained between the working and derived standards at a facility.	X	X	X	X	X		X	
11.08.01.243	ANSI N323A - 1997	6.1.a	Sources to be used for calibrations shall comply with national/international standards.	X	X	X	X	X		X	
11.08.01.244	ANSI N323A - 1997	6.1.b	Calibration fields shall be known with an accuracy compared to secondary or national standards as noted in Table 3. Note: For Table 3, see SRID Functional Area 00.	X	X	X	X	X		X	
11.08.01.245	ANSI N323A - 1997	6.1.c	Radiation fields used for calibration shall be characterized and documented in terms of quantity and reproducibility.	X	X	X	X	X		X	
11.08.01.246	ANSI N323A - 1997	6.1.d	With the exception of a calibration facility where an uncollimated source is used in a large room (i.e., free space), calibration beams shall be collimated so that their size is limited to an area consistent with calibration requirements.	X	X	X	X	X		X	
11.08.01.247	ANSI N323A - 1997	6.1.e	Constancy checks shall be performed annually as a minimum for all sources.	X	X	X	X	X		X	
11.08.01.248	ANSI N323A - 1997	6.1.f	Machine-generated beams shall employ continuous beam monitors as a working standard for calibration purposes.	X	X	X	X	X		X	
11.08.01.249	ANSI N323A - 1997	6.1.g	Continuous beam monitors shall be calibrated at least annually with secondary or tertiary standards.	X	X	X	X	X		X	
11.08.01.250	ANSI N323A - 1997	6.1.h	If absorbers, collimators, or high-scatter geometries are employed, the effect on the calibration accuracy relative to a low-scatter geometry shall be known.	X	X	X	X	X		X	
11.08.01.251	ANSI N323A - 1997	6.1.i	When shutters or other source control devices are used, the effect of transit time on dose equivalent shall be known and accounted for as required.	X	X	X	X	X		X	

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11.08.03.025	10 CFR 835	Sub.L.835.1102 (e)	(e) Protective clothing shall be required for entry to areas in which removable contamination exists at levels exceeding the removable surface contamination values specified in appendix D of this part. Note: For Appendix D, see the Source Document.	X	X	X	X	X		X	
11.09.04.002	10 CFR 835	Sub.B.835.101(a)	(a) A DOE activity shall be conducted in compliance with a documented radiation protection program (RPP) as approved by the DOE.	X	X	X	X	X		X	
11.09.04.004	10 CFR 835	Sub.B.835.104	Written procedures shall be developed and implemented as necessary to ensure compliance with this part, commensurate with the radiological hazards created by the activity and consistent with the education, training, and skills of the individuals exposed to those hazards.	X	X	X	X	X		X	
11.09.04.005	ANSI/HPS N43.2 - 2001	6.2.2.1.7	If the radiation source housing and/or x-ray accessory apparatus are not compatible (i.e. nonstandard) components supplied by the same manufacturer, procedures shall be documented by the person in charge of the use of the system.	X	X	X	X	X		X	
11.09.04.006	ANSI/HPS N43.2 - 2001	7.4.4	Alignment procedures recommended by manufacturer of the x-ray system shall be used when available. Special alignment procedures shall not be used unless approved by the person in charge of the analytical x-ray installation	X	X	X	X	X		X	