

Office of Environmental Management – Grand Junction



Moab UTR A Project
Radiation Protection Program

Revision 4

January 2016



U.S. Department
of Energy

Office of Environmental Management

**Moab UMTRA Project
Radiation Protection Program**

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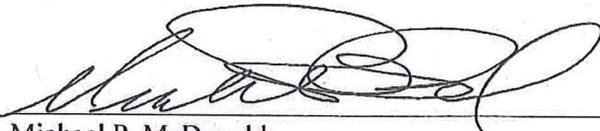
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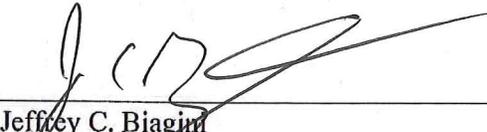
Review and Approval

 For Ron Daily 03/22/2016

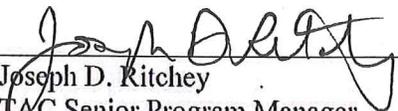
Ronald R. Daily Date
RAC Radiological Control Manager

 3-22-16

Michael P. McDonald Date
RAC Environmental, Safety, Health, and Quality Manager

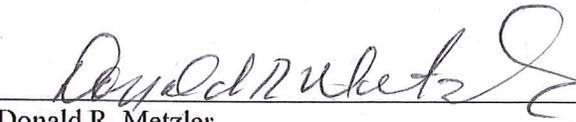
 3-22-2016

Jeffrey C. Biagini Date
RAC Project Manager

 3/22/16

Joseph D. Ritchey Date
TAC Senior Program Manager

Reviewed by:

 3-23-16

Donald R. Metzler Date
DOE Moab Federal Project Director

Revision History

Revision Number	Date	Reason for Revision
0	September 2007	Initial issue.
1	April 2010	Includes an update of the DOE Laboratory Accreditation Program implementation dates and the addition of DOE Radon Exemption support documentation.
2	September 2010	Includes the addition of definitions (Attachment 2) and updates to reflect mandatory modifications in 10 CFR 835 (Sections 2.1, 3.5, 11.0, 15.0, and Appendix A).
3	April 2014	Revision includes updates of new RAC contract numbers and signatories.
4	January 2016	Revision made to support a DOE formal review and approval.

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Attachment

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Acronyms and Abbreviations

§	section
ALARA	as low as reasonably achievable
CFR	Code of Federal Regulations
Ci	curies
cm ²	centimeters squared
DAC	derived air concentration
dpm	disintegrations per minute
DOE	U.S. Department of Energy
DOELAP	Department of Energy Laboratory Accreditation Program
DOT	U.S. Department of Transportation
EM	Office of Environmental Management
Gy	gray
hr	hour
ICRP	International Commission on Radiological Protection
LM	Legacy Management
MeV	megaelectron volts
μCi	microcuries
μSv	microsieverts
M	million
mrem	millirems
mSv	millisieverts
nCi	nanocuries
N/A	not applicable
NRC	Nuclear Regulatory Commission
PPE	personal protective equipment
Pub. L.	Public Law
RAC	Remedial Action Contractor
rem	roentgen equivalent man
Rn	radon
RPP	Radiation Protection Program
RRM	residual radioactive material
SI	International System
SOW	scope of work
Std	Standard
Sv	sieverts
TAC	Technical Assistance Contractor
U	uranium
U-nat	natural uranium
URC	Uranium Reduction Company
UMTRA	Uranium Mill Tailings Remedial Action
WL	working level

1.0 Implementation Plan Summary

1.1 Purpose

The U.S. Department of Energy (DOE) Office of Environmental Management (EM) identifies Title 10 Code of Federal Regulations Part 835 (10 CFR 835), “Occupational Radiation Protection,” as the driver for this Radiation Protection Program (RPP). The purpose of this RPP is to formally commit, in policy and deed, to implementation of 10 CFR 835 requirements.

This RPP establishes radiation protection standards, limits, and program requirements for protecting individuals from occupational exposures to ionizing radiation resulting from work performed by the Remedial Action Contractor (RAC) and the Technical Assistance Contractor (TAC) related to the Moab Uranium Mill Tailings Remedial Action (UMTRA) Project.

This RPP is incorporated into the seven guiding principles and five core functions of Integrated Safety Management. This RPP has been designed to ensure radiological control requirements, as defined in 10 CFR 835, are incorporated into applicable facility design and conduct of radiological work at the Moab, Utah, and Crescent Junction, Utah, sites.

1.2 Historical Information

The Moab site is a former uranium ore-processing facility located about 3 miles northwest of the city of Moab in Grand County, Utah, and lies on the western bank of the Colorado River at the confluence with the Moab Wash. The site encompasses approximately 400 acres; a 130-acre uranium mill tailings pile occupies much of the western portion. Steep sandstone cliffs border the site on the north and southwest. The Colorado River forms the southeastern boundary of the site. U.S. Highway 191 parallels the northern site boundary, and State Route 279 crosses the western portion of the site. The entrance to Arches National Park is located less than 1 mile northwest of the site across U.S. Highway 191. The Union Pacific Railroad traverses a small section of the site just west of State Route 279, then enters a tunnel and emerges several miles to the southwest. The Moab Wash is an ephemeral stream that traverses the center of the site and joins with the Colorado River.

Originally, the property and facility were owned by the Uranium Reduction Company (URC) and regulated by the Atomic Energy Commission. In 1956, URC began operations of the Moab mill. In 1962, the Atlas Minerals Company acquired URC and operated the mill until operations ceased in 1984. From 1956 to 1984, uranium mill tailings were deposited on site in an unlined impoundment. In 1988, decommissioning of the mill began, and from 1989 to 1995, an interim cover was placed on the impoundment. In 1998, the Atlas Mineral Company declared bankruptcy, and ownership was transferred to the Moab Reclamation Trust. In October 2001, control of the Moab site was transferred from the Moab Reclamation Trust to DOE. Since this time, site characterization, maintenance, and ground water interim actions have been ongoing.

In 2012, Portage, Inc., was awarded the RAC contract for the Moab UMTRA Project and has developed this RPP to address the full scope of activities to be conducted and the processes with which to implement 10 CFR 835 requirements .

The scope of this RPP includes all activities and facilities under the control of the RAC, the activities conducted by the TAC, and any subcontractor performing work for the RAC and/or TAC at the Project sites, with the exception of work conducted under a U.S. Nuclear Regulatory Commission (NRC) or agreement state license.

The content of this RPP is designed to be commensurate with the nature of activities performed under the authority of DOE-EM.

1.3 Scope

This RPP is intended to address the full scope of activities associated with the transfer of the entire tailings pile (16 million [M] tons) from Moab to Crescent Junction. These activities will consist of design, procurement, construction, commissioning, and operations to remediate the entire 16M tons of residual radioactive material (RRM).

This RPP is applicable to all activities related to engineering and design, procurement and construction, commissioning and operational startups, excavation, material handling, loading, on-site transportation, disposal, site maintenance, water management, and vicinity property remediation.

2.0 General

2.1 Compliance

This RPP is submitted to meet the Price-Anderson Amendments Act (Public Law 100-408) requirements of 10 CFR 835, as amended June 8, 2007, corrected April 21, 2009 and amended on April 4, 2011. Each requirement contained in 10 CFR 835 has been addressed in Appendix A of this RPP. The RAC classifies its compliance status as being in one of the following three categories.

1. *Full Compliance* – indicating that the requirement is documented as a commitment in policy and that implementing plans, protocols, and procedures will be in place and functioning as each activity governed by 10 CFR 835 commences. These required implementing documents and work practices will be verifiable through inspection.
2. *Not Applicable* – indicating the Project will not engage in that particular activity governed by a particular portion of 10 CFR 835. When a section of 10 CFR 835 is determined to be not applicable (N/A), the reason for this determination will be provided under the “Description of Compliance Status” heading for that specific section of 10 CFR 835 in Appendix A. See Table 1 for items presented as N/A.
3. *Conditional Compliance* – indicating the Project will provide a program in full compliance as defined above and as modified and with the agreed clarification of compliance by the DOE (i.e., full compliance is concurrent with DOE approval of this RPP.)

2.2 Plan Content and Format

The content of this plan is based upon the required elements of 10 CFR 835 and 10 CFR 820, “Procedural Rules for DOE Nuclear Activities.”

Table 1. 10 CFR 835 Items Presented with N/A Status

Item	Condition	Brief Description and Narrative
Appendix C	N/A	Immersion DACs: Radionuclides presented in 10 CFR 835 Appendix C are not found on the Moab UMTRA Project.
835.3(c)	N/A	DOE responsibility when there is no contractor: The RAC is the responsible DOE contractor.
835.402(b)(2)	N/A	External DOELAP Equivalency: The RAC <u>does not seek</u> this DOELAP equivalence determination (see 835.402 [b][1] of Parts Conditionally Compliant).
835.1304(a-b)	N/A	Nuclear Accident Dosimetry: There are no conditions under which a credible nuclear accident event could occur on this Project.

DAC = derived air concentration; DOELAP = Department of Energy Laboratory Accreditation Program

3.0 Scope and Applicability

The scope of this RPP is any activity associated with the completion of the scope of work (SOW) defined under the RAC contract and conducted on behalf of the DOE by the RAC, TAC, and all subcontractors and suppliers that have the potential to result in the following:

- Occupational exposures to ionizing radiation (as defined in 10 CFR 835)
- Exposure to minors and members of the public (as defined in 10 CFR 835.2)
- Emergency exposures (as defined in 10 CFR 835.1302)
- Exposures to embryo/fetus of a declared pregnant worker (as defined in 10 CFR 835.2)

The RPP applies to all DOE, RAC, TAC, and subcontractor Project activities at locations, facilities, and sites that are within the contract SOW. Consequently, all personnel shall comply with the applicable radiation protection procedures that implement this RPP. Implementing guidance and requirements contained in this RPP are intended to help itemize and clarify radiation protection responsibilities and performance expectations.

3.1 Recognized Exclusions

None.

3.2 Operational Tasks

In 10 CFR 835.101(d), it states: “The RPP shall specify the existing and/or anticipated operational tasks that are intended to be within the scope of the RPP.” These include the following eight tasks:

1. Environmental monitoring
2. Environmental remediation
3. Environmental restoration
4. Project site disposition
5. Vicinity property remediation
6. Materials handling
7. Construction and facilities operations
8. Site tours and visits

3.3 Radiological Hazard Assessment

Radiological hazards associated with uranium mill byproducts (tailings) are related to the generic categories of direct gamma and beta radiation exposure, inhalation or ingestion of airborne radioactivity and gases, ingestion of loose surface contamination, contaminated soil and other contaminated environmental media, and direct transfer of radioactivity into the bloodstream through wounds.

The best data available indicates that the tailings material contains picocuries per gram quantities ($1E-12$ curies [Ci]) of uranium decay products. Radiological hazards and levels found during the remediation of several large tailings sites (e.g., Grand Junction and Rifle, Colorado; Mexican Hat and Monticello, Utah) included airborne radioactive particulates in quantities ranging from a fraction of a derived air concentration (DAC) up to a few DACs, radon concentrations ranging up to several working levels (WLs), and dose rates ranging from background to 2 millirems per hour (mrem/hr). Similar conditions are expected during the Moab site remediation.

3.4 Policy

With submittal of this RPP, the RAC establishes its policy towards applicable 10 CFR 835 requirements and for the conduct of its radiological operations in a manner that ensures a safe work environment for RAC, TAC, and DOE employees, subcontractors, visitors, and the general public.

This document is applicable to all RAC and TAC employees, subcontractor personnel (in accordance with the provisions of standard subcontract clauses), DOE personnel, and employees of other federal agencies performing activities at the Moab and/or Crescent Junction sites.

The RAC is committed to continuing improvement, with respect to optimizing and maintaining excellence in radiological control. Excellent performance is evident when individual doses are maintained well below regulatory limits, radioactive materials are well controlled, and uncontrolled releases of radioactive material are prevented.

3.5 Principles

The following principles guide the Radiation Protection Program on the Moab UMTRA Project.

- Passive and active engineered controls are used within the operational and facility designs, implement administrative controls, and implement personal protective equipment (PPE), where practical, to ensure radiation exposures are as low as reasonably achievable (ALARA), and that radioactive material is contained for effective personnel protection.
- Radiation exposure to the work force and the public is controlled such that exposures are well below regulatory limits and there is no radiation exposure without commensurate benefit.
- Each individual performing work for the Moab UMTRA Project, around or with radioactive material, is expected to demonstrate responsibility and accountability through an informed, disciplined, and cautious attitude toward RRM.

- Line management (i.e., Project managers and supervisors) shall:
 - Be responsible for compliance with 10 CFR 835 requirements and the content of this RPP.
 - With the assistance of radiological protection personnel, identify and integrate applicable radiological protection aspects into facility and operational designs, work planning, and execution.
 - Notify the RAC Environmental, Safety, Health, and Quality Manager or Radiological Control Manager of physical and/or operational conditions that could result in significant changes in radiological hazards (e.g., a revised method or procedure, unanticipated radiological conditions). Notifications initiate radiological protection evaluations and/or modifications to monitoring, posting, PPE, and/or entry controls.
- No employee, subcontractor, or visitor shall take or cause to be taken, any action inconsistent with the requirements of this RPP or any program, plan, schedule, or other process established by 10 CFR 835.
- Nothing in this document shall be construed as limiting actions that may be necessary to protect health and safety.
- The content of the RPP shall be commensurate with the nature of the activities performed and shall include formal plans and measures for applying the ALARA process to occupational exposure.
- The content of this RPP addresses, but is not necessarily limited to, each requirement in 10 CFR 835.
- This RPP utilizes plans, procedures, and other measures for achieving compliance with regulations of 10 CFR 835, as applicable. These documents are listed in Section 4.0.
- An update of this RPP shall be submitted to the DOE:
 - When a change or an addition to the RPP is made.
 - Before initiation of a task not within the scope of the RPP.
 - Within 180 days of the effective date of any modifications to 10 CFR 835.

4.0 List of Applicable Standards

10 CFR 830 (Code of Federal Regulations), “Nuclear Safety Management,” Subpart A, “Quality Assurance Requirements”

10 CFR 835 (Code of Federal Regulations), “Occupational Radiation Protection”

5 USC 552 (United States Code), Freedom of Information Act

5 USC 552a (United States Code), Privacy Act of 1974

22 USC 56 (United States Code), U.S. Institute of Peace Act of 1984

42 USC 2011 (United States Code) Atomic Energy Act

ANSI (American National Standards Institute) Standard N13.6-1999, “Practice for Occupational Accreditation Program for Personnel Dosimetry Systems” (DOE/EH-0026)

ANSI (American National Standards Institute) Standard N13.6-1966, “Practice for Occupational Radiation Exposure Records Systems” (DOE/EH-0052)

ANSI/HPS (American National Standards Institute/Health Physics Society) N13.30-1996, “Performance Criteria for Radiobioassay”

ACJ & Associates, Inc, “User Manual for IMBA Expert,” Appendix A, “Technical Basis,” August 2005

ACJ & Associates, Inc, “User Manual for IMBA Professional Plus,” Appendix B, “Bioassay Quality Assurance,” May 2005

ANSI/HPS N13.6-1999 (American National Standards Institute/Health Physics Society), “Practice for Occupational Radiation Exposure Records Systems,” 1999

ANSI/HPS N13.30-1996 (American National Standards Institute/Health Physics Society), “Performance Criteria for Radiobioassay,” 1996

ANSI/HPS N13.39-2001 (American National Standards Institute/ Health Physics Society), “Design of Internal Dosimetry Programs,” 2001

ASME (American Society of Mechanical) Codes and Standards

ASTDR (Agency for Toxic Substances and Disease Registry), “Uranium Toxicity: Case Studies in Environmental Medicine,” (WB1524), 2009

DOE (U.S. Department of Energy), “Department of Energy Standard for the Performance Testing of Personnel Dosimetry Systems” (DOE/EH-0027)

DOE (U.S. Department of Energy), “Gap Analysis for IMBA and DOE Safety Software Central Registry Recommendation” (DOE-EH/0711), August 2006

DOE (U.S. Department of Energy) Guide 441.1-1C, “Radiation Protection Programs Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection”

DOE (U.S. Department of Energy) Guide 441.1-3A, “Internal Dosimetry Program Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection”

DOE (U.S. Department of Energy) Manual 231.1-1A, Chg. 2, “Environment, Safety, and Health Reporting Manual”

DOE (U.S. Department of Energy) Manual 232.1-2, “Occurrence Reporting and Processing of Operations Information”

DOE (U.S. Department of Energy) *Moab UMTRA Project Annual Site Environmental Report for Calendar Year 2008* (DOE-EM/GJ1842)

DOE (U.S. Department of Energy) *Moab UMTRA Project Dosimetry Technical Basis Manual* (DOE-EM/GJRAC1913)

DOE (U.S. Department of Energy) *Moab UMTRA Project Health Physics Plan* (DOE-EM/GJ3003)

DOE (U.S. Department of Energy) *Moab UMTRA Project Internal Dosimetry Technical Basis Manual* (DOE-EM/GJRAC1913)

DOE (U.S. Department of Energy) *Moab UMTRA Project Particulate Air Monitoring* (DOE-EM/GJRAC1744)

DOE (U.S. Department of Energy) *Moab UMTRA Project Quality Control for Radioactivity Counting Systems* (DOE-EM/GJRAC1741)

DOE (U.S. Department of Energy) *Moab UMTRA Project Radiation Protection Program Manual* (DOE-EM/GJRAC1885)

DOE (U.S. Department of Energy) *Moab UMTRA Project Radon Monitoring Procedure* (DOE-EM/GJRAC1745)

DOE (U.S. Department of Energy) *Moab UMTRA Project Records Management Manual* (DOE-EM/GJ1545)

DOE (U.S. Department of Energy) *Moab UMTRA Project Remedial Action Plan* (DOE-EM/GJ1547)

DOE (U.S. Department of Energy) Order 231.1-1A, Chg. 1, “Environment, Safety, and Health Reporting”

DOE (U.S. Department of Energy) Order 232.1A, Chg. 1, “Occurrence Reporting and Processing of Operations Information”

DOE (U.S. Department of Energy) Standard 1098-2008, “Radiological Control”

DOE (U.S. Department of Energy) Standard 1111-1998, “The Department of Energy Laboratory Accreditation Program Administration”

DOE (U.S. Department of Energy) Standard-1112-1998, “The Department of Energy Laboratory Accreditation Program for Radiobioassay”

DOE (U.S. Department of Energy) Standard-1121-2008, “Internal Dosimetry”

DOE (U.S. Department of Energy) Standard-1136-2009, “Guide of Good Practices for Occupational Radiological Protection in Uranium Facilities”

DOE (U.S. Department of Energy) Standard-1198-2008, “Radiological Control”

Durrige Company, Inc., “RAD7 Radon Detector User Manual”

Gusev, Igor, *et. al.*, “Medical Management of Radiation Accidents,” Second Edition, CRC Press, 2001

IAEA (International Atomic Energy Agency) Safety Report Series 33, “Radiation Protection against Radon in Workplaces other than Mines,” 2003

ICRP (International Commission on Radiological Protection) Publication 23, “Report of the Task Group on Reference Man,” 1975

ICRP (International Commission on Radiological Protection) Publication 30, “Reference Man: Anatomical, Physiological, and Metabolic Characteristics,” 1975

ICRP (International Commission on Radiological Protection) Publication 60, “1990 Recommendations of the International Commission on Radiological Protection, User’s Edition,” 1992

ICRP (International Commission on Radiological Protection) Publication 65, “Protection Against Radon-222 at Home and at Work,” 1994

ICRP (International Commission on Radiological Protection) Publication 66, “Human Respiratory Tract Model for Radiological Protection,” 1994

ICRP (International Commission on Radiological Protection) Publication 67 “Human Age-dependent Doses from Intake of Radionuclides,” 1993

ICRP (International Commission on Radiological Protection) Publication 68, “Dose Coefficients for Intakes of Radionuclides by Workers,” 1995

ICRP (International Commission on Radiological Protection) Publication 69, “Age-Dependent Doses to Members of the Public from Intake of Radionuclides: Part 2, Ingestion Dose Coefficients,” 1994

ICRP (International Commission on Radiological Protection) Publication 69, “Age-Dependent Doses to Members of the Public from Intake of Radionuclides: Part 3, Ingestion Dose Coefficients,” 1995

ICRP (International Commission on Radiological Protection) Publication 71, “Age-Dependent Doses to Members of the Public from Intake of Radionuclides: Part 4, Inhalation Dose Coefficients,” 1995

ICRP (International Commission on Radiological Protection) Publication 72, “Age-Dependent Doses to the Members of the Public from Intake of Radionuclides Part 5, Compilation of Ingestion and Inhalation Coefficients,” 1996

ICRP (International Commission on Radiological Protection) Publication 75, “General Principles for the Radiation Protection of Workers,” 1997

ICRP (International Commission on Radiological Protection) Publication 78, “Individual Monitoring for Internal Exposure of Workers,” 1998

ICRP (International Commission on Radiological Protection) Publication 88, “Doses to the Embryo and Fetus from Intakes of Radionuclides by the Mother,” 2002

ICRP (International Commission on Radiological Protection) Publication 89, “Basic Anatomical and Physiological Data for Use in Radiological Protection: Reference Values,” 2003

Leiken, J.B. and Paloucek, F.P., “Poisoning and Toxicology Handbook,” Information Healthcare USA, Inc., New York, 2008

MACTEC, Inc., “MACTEC Technical Basis for Internal Dosimetry,” (MAC-3016), 1999

Mirion Technologies, Inc.,” DOELAP Technical Document”

Mirion Technologies, Inc.,” Global Dosimetry Services Division Thermoluminescent Dosimeter Technical Basis Document”

Mirion Technologies, Inc., “Quality Assurance Manual,” “Radiation Exposure Records Systems”

NCRP (National Council on Radiation Protection and Measurements) Report No. 87, “Use of Radiobioassay Procedures for Assessment of Internal Radionuclide Deposition,” 1987

NCRP (National Council on Radiation Protection and Measurements) Report No. 161, “Management of Persons Contaminated With Radionuclides: Handbook,” 2010

NRC (U.S. Nuclear Regulatory Commission) Contractor Report, “Radiological Assessment – A Textbook on Environmental Dose Analysis” (NUREG/CR-3332), 1983

NRC (U.S. Nuclear Regulatory Commission) Regulatory Guide 8.25, “Air Sampling In the Workplace,” 1992

Public Law 106-65, “National Defense Act,” 1999

5.0 Additional Activities

N/A.

6.0 Graded Approach

Plans, protocols, procedures, and their implementation will be commensurate with anticipated hazards and will comply with 10 CFR 835.

7.0 Resource Assessment

N/A.

8.0 Prioritization

The RAC recognizes the applicable elements of 10 CFR 835 as being equal in importance.

9.0 Activities, Milestones, and Schedules

The RAC is currently in full compliance with the requirements of 10 CFR 835 as specified in Appendix A of this RPP.

9.1 Plans, Policies, and Procedures

The RAC plans, policies, and procedures have been verified to be accurate and applicable. These plans, policies, and procedures will be used by the RAC to support and govern any work activity identified based on the current SOW.

9.2 External Dosimetry, Internal Dosimetry, and Radiobioassay DOE Laboratory Accreditation Program

The RAC has achieved and maintains DOE Laboratory Accreditation Program (DOELAP) accreditation for both radiobioassay and external dosimetry.

9.3 Audits

Internal audits of the RPP, including examination of program content and implementation, shall be conducted through a process that ensures all functional elements of the program are reviewed no less frequently than every 36 months. As a matter of practice, functional areas will be selected, scheduled, and reviewed on a quarterly basis. Additionally, a broad scope review will be conducted every 36 months.

The RPP audit schedule will be based on the functional elements outlined in DOE Guide 441.1-1C, "Radiation Protection Programs Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection," May 19, 2008, or its succeeding equivalent. These elements are presented in Table 2.

Table 2. 10 CFR 835 Functional Elements

Functional Element		10 CFR 835 Regulatory Provision
1.	Organization and Administration	Subpart B
2.	ALARA	101(c), Subpart K
3.	External Dosimetry	401(a),(b)
4.	Internal Dosimetry	401(a), 402(c),(d)
5.	Area Monitoring and Control	
	a. Area Radiation Monitoring	401(a)
	b. Airborne Radioactivity Monitoring	209, 401(a), 403
	c. Contamination Monitoring and Control	401(a), Subpart L
	d. Instrumentation Calibration and Maintenance	401(b)
6.	Radiological Controls	
	a. Radiological Work Planning	501(d), 1001(b), 1003
	b. Entry and Exit Controls	Subpart F
	c. Radiological Work Controls	Subpart F, 1003
	d. Posting and Labeling	Subpart G
	e. Release of Materials and Equipment	1101
	f. Sealed Radioactive Source Accountability and Control	Subpart M
7.	Emergency Exposure Situations	1301, 1302
8.	Nuclear Accident Dosimetry	1304
9.	Records	Subpart H
10.	Reports to Individuals	Subpart I
11.	Radiation Safety Training	Subpart J
12.	Limits for the Embryo Fetus	Subpart C

10.0 Exemptions

The Project has revoked the request to DOE for a radon exemption, and currently monitors all radiological workers who routinely enter the contamination areas.

11.0 Compensatory Actions

The highest dose rates on the pile are approximately 0.8 milliroentgens per hour (mR/hr). These dose rates may change based upon the areas of the tailings pile being excavated and the radiological concentrations of the tailings. The RAC will continue to monitor and respond to changing workplace conditions by revising work protocols and monitoring strategies to optimize personnel exposure following the ALARA process.

Conditions beyond the pile (the area surrounding the pile and vicinity properties) that have been remediated are such that dose and dose rates have not been significant and will never be significant; it is unlikely to present any dose rate conditions leading to an assessed exposure greater than the various monitoring thresholds defined in 10 CFR 835.402(b).

Elements of 10 CFR 835 related to DOELAP accreditation and the scheduling of this important milestone are compensated for by using radioanalytical vendors who currently hold DOELAP accreditations through other DOE prime contractors in the same radionuclides and radiation types as those found at the Moab site.

The RAC has completed the internal technical review of its radiological monitoring programs and has developed technical basis manuals for internal/external dosimetry, air monitoring, and bioassay.

Conditionally compliant items have been called out and summarized in Section 2.0 and are specifically addressed in each compliance statement in Appendix A.

Other items, clearly not in the RAC scope, have been addressed as N/A and thus, require no compensatory discussion or actions.

12.0 ALARA Statement

The RAC is firmly committed to having a Radiological Control Program of the highest quality guided by a formalized *Moab UMTRA Project ALARA Program* (DOE-EM/GJRAC1922). The ALARA program is designed to be commensurate with the nature of the RAC work activities to be performed.

12.1 ALARA Policy

The RAC policy is to conduct radiological operations in a manner that promotes the health and safety of all employees, subcontractors, and the general public. In achieving this objective, the RAC policy is to make every reasonable effort to maintain occupational, environmental, and public radiation exposure from DOE activity levels ALARA. The ALARA philosophy is predicated on the theory that any radiation exposure, however small, carries with it some risk, which should be balanced by an offsetting benefit. The management of the RAC affirms the following:

- Personal radiation exposure shall be maintained ALARA.
- Radiation exposure of the work force and public shall be controlled using a graded approach, such that radiation exposures are well below regulatory limits and there is no radiation exposure without commensurate benefit.
- Each person involved in radiological work is expected to demonstrate responsibility and accountability through an informed, disciplined, and cautious attitude toward radiation and radioactivity.
- Excellent performance is evident when site missions are completed, and radiation exposures are maintained well below regulatory limits, contamination is minimized, radioactivity is well controlled, and radiological spills or uncontrolled releases are prevented.
- Continuing improvement is essential to excellence in radiological control.
- It is the responsibility of the RAC management and of all workers to comply with the RPP and use ALARA principles during all work activities.

12.2 Formal ALARA Plans and Measures

The RAC has a formal ALARA Program and takes measures to address the following:

- Management commitment
- Assignment of responsibilities and authorities
- Administrative performance goals and measures
- Radiological performance goals and measures
- ALARA training
- Plans and procedures
- Internal audits and assessments
- Optimization methodology
- Radiological design review
- Radiological work planning
- Records

13.0 References

10 CFR 820 (Code of Federal Regulations), “Procedural Rules for DOE Nuclear Activities”

10 CFR 835 (Code of Federal Regulations), “Occupational Radiation Protection”

DOE (U.S. Department of Energy) Guide 441.1-1C, “Radiation Protection Programs Guide for Use with Title 10, Code of Federal Regulations, Part 835, Occupational Radiation Protection”

DOE (U.S. Department of Energy) *Moab UMTRA Project ALARA Program* (DOE-EM/GJRAC1922), November 2013

Public Law 100-408, Price-Anderson Amendments Act of 1988

Appendix A.
Radiation Protection Program Compliance Statements

Appendix A. Radiation Protection Program Compliance Statements

10 CFR 835 Revised April 21, 2009

STATUS: Full Compliance

The RAC commits to comply with all parts of 10 CFR 835 as they apply to the activities performed within the scope of this RPP.

10 CFR 835 Appendix A

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835 Appendix A, "Derived Air Concentrations for Controlling Radiation Exposure to Workers at DOE Facilities"

Provides DAC values for various Radionuclides.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC adopts and complies with 10 CFR 835 Appendix A, its preamble, and footnotes 1 - 4 in their entirety.

10 CFR 835 Appendix A, Footnote 5

STATUS: Conditional Compliance

REQUIREMENT STATEMENT:

10 CFR 835 Appendix A, "Derived Air Concentrations for Controlling Radiation Exposure to Workers at DOE Facilities", Footnote 5

These values are appropriate for protection from radon combined with its short-lived decay products and are based on information given in International Commission on Radiological Protection (ICRP) Publication 23: Age-dependent Dose to Member of the Public from Intake of Radionuclides Part 2 Ingestion Dose Coefficients, ICRP Publication 65: Protection Against Radon-222 at Home and at Work, ICRP Publication 68: Human Respiratory Tract Model for Radiological Protection, and in DOE Standard (STD)-1121-2008: Internal Dosimetry. The values given are for 100 percent equilibrium concentration conditions of the short-lived radon decay products with the parent. To allow for an actual measured equilibrium concentration or a demonstrated equilibrium concentration, the values given in this table should be multiplied by the ratio (100% / actual %) or (100% / demonstrated %), respectively. Alternatively, the DAC values for radon-220 (Rn-220) and Rn-222 may be replaced by 2.5 WL and 0.83 WL, respectively, for appropriate limiting of decay product concentrations. A WL is any combination of short-lived radon decay products, in 1 liter of air without regard to the degree of equilibrium that will result in the ultimate emission of $1.3 \text{ E}+05$ MeV of alpha energy.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC implements a program that allows for the references and options provided in 10 CFR 835 Appendix A, Footnote 5. RAC has developed a radon monitoring routine for radiological workers in the sites contamination areas.

10 CFR 835 Appendix B

STATUS: N/A

REQUIREMENT STATEMENT:

10 CFR 835 Appendix B has been reserved by the DOE.

DESCRIPTION OF COMPLIANCE STATUS:

The section does not require a compliance statement.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835 Appendix C

§ STATUS: N/A

REQUIREMENT STATEMENT (Preamble, Appendix A, Second Paragraph):

10 CFR 835 Appendix C, “Derived Air Concentration (DAC) for Workers From External Exposure During Immersion in a Cloud of Airborne Radioactive Material”

DESCRIPTION OF COMPLIANCE STATUS:

Appendix B, its preamble, and footnote are N/A to the RAC activities under this RPP.

10 CFR 835 Appendix D

STATUS: Conditional Compliance

REQUIREMENT STATEMENT:

10 CFR 835 Appendix D, “Surface Contamination Values”

The data presented in appendix D are to be used in identifying and posting contamination and high contamination areas in accordance with section (§) 835.603(e) and (f) and identifying the need for surface contamination monitoring and control in accordance with § 835.1101 and 1102.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC uses and adopts 10 CFR 835 Appendix D in its entirety to identify and post contamination and high contamination areas in accordance with 10 CFR 835.603(e) and 10 CFR 835.603(f), and for identifying the need for surface contamination monitoring and control in accordance with 10 CFR 835.1101 and 10 CFR 835.1102. With regard to how 10 CFR 835 Appendix D is applicable to tailings material, the RAC interprets tailings to be most closely and accurately categorized as “associated decay products,” in the “U-nat, U-235, U-238 and associated decay product” portion of the table in 10 CFR 835 Appendix D. Unless concentrated values of individual radionuclides are encountered, the values of 1000/5000 disintegrations per minute / 100 centimeters squared (dpm/100 cm²), removable and total, respectively, will be applied.

10 CFR 835 Appendix D, Footnote 1

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835 Appendix D, “Surface Contamination Values”, Footnote 1

Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides apply independently.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC applies the surface contamination limits independently for both alpha- and beta-gamma-emitting nuclides when they exist together.

10 CFR 835 Appendix D, Footnote 7

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835 Appendix D, “Surface Contamination Values”, Footnote 7

These limits apply only to the alpha emitters within the respective decay series.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC applies the surface contamination limits only to the alpha emitters within the respective decay series; however, beta surface contamination is also monitored and will be evaluated when the alpha to beta ratios are out of proportion.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835 Appendix E

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR Part 835 Appendix E, “Values for Establishing Sealed Radioactive Source Accountability and Radioactive Material Posting and Labeling Requirements”

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC uses 10 CFR 835 Appendix E in its entirety for identifying accountable sealed radioactive sources and radioactive material areas as those terms are defined at 10 CFR 835.2(a), establishing the need for radioactive material area posting in accordance with 10 CFR 835.603(g), and establishing the need for radioactive material labeling in accordance with 10 CFR 835.605.

10 CFR 835.1(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1, “Scope.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC recognizes that the rules in 10 CFR 835 establish radiation protection standards, limits, and program requirements for protecting individuals from ionizing radiation resulting from the conduct of DOE activities.

10 CFR 835.1(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1, “Scope.” (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 Public Law (Pub. L). 98-525 and Pub. L. 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

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC recognizes that the requirements in 10 CFR 835 do not apply to:

1. Activities that are regulated through a license by the NRC or a state under an agreement with the NRC, including activities certified by the NRC 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, "U.S. Institute of Peace Act," and Pub. L. 106-65, "National Defense Authorization Act."
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 U.S., on territory under the jurisdiction of a foreign government, to the extent governed by occupational radiation protection requirements agreed to between the U.S. 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.
6. Radioactive material on or within material, equipment, and real property 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 the DOE or a DOE contractor.

10 CFR 835.1(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1, "Scope." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC recognizes that occupational doses received as a result of excluded activities and radioactive material transportation, as listed in 10 CFR 835.1(b)(1) through 10 CFR 835.1(b)(4), and in 10 CFR 835.1 (b)(7), shall be considered when determining compliance with the occupational dose limits at 10 CFR 835.202 and 10 CFR 835.207 and with the limits for the embryo/fetus at 10 CFR 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 10 CFR 835.202 and 10 CFR 835.207.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.1(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1, "Scope." (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.
2. In accordance with Department of Transportation (DOT) regulations or DOE orders that govern such movements.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC understands that the requirements in 10 CFR 835 Subpart F and 10 CFR 835 Subpart G do not apply to radioactive material transportation by the 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.
2. In accordance with DOT regulations or DOE orders that govern such movements.

10 CFR 835.2

STATUS: Conditional Compliance

REQUIREMENT STATEMENT:

10 CFR 835.2, "Definitions."

- a. As used in this part: (defined terms not copied here.)
- b. As used in this part to describe various aspects of radiation dose: (defined terms not copied here.)
- c. Terms defined in the Atomic Energy Act of 1954 or in 10 CFR part 820 and not defined in this part are used consistent with their meanings given in the Atomic Energy Act of 1954 or in 10 CFR part 820.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC accepts the definitions of general terminology in section 10 CFR 835.2(a) and the definitions of dosimetry terminology in 10 CFR 835.2(b) without exception, beyond noting that the RAC will use references and documents that were written under the dosimetric nomenclature associated with the versions of 10 CFR 835 effective before 2007. The RAC recognizes that terms defined in the Atomic Energy Act and those not defined in this part are used consistent with the meanings given in the Act.

10 CFR 835.3(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.3, "General rule." (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC requires that all personnel may only take actions or cause actions to be taken that are consistent with the requirements of 10 CFR 835 or any program, plan, schedule, or other process established by 10 CFR 835.

10 CFR 835.3(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.3, "General rule." (b)

With respect to a particular DOE activity, contractor management shall be responsible for compliance with the requirements of this part.

DESCRIPTION OF COMPLIANCE STATUS:

With respect to all activities conducted under the RAC contract with the DOE, the RAC management is responsible for compliance with the requirements of 10 CFR 835.

10 CFR 835.3(c)

STATUS: N/A

REQUIREMENT STATEMENT:

10 CFR 835.3, "General rule." (c)

Where there is no contractor for a DOE activity, DOE shall ensure implementation of and compliance with the requirements of this part.

DESCRIPTION OF COMPLIANCE STATUS:

This requirement is N/A to the RAC; it is directly applicable to the DOE.

10 CFR 835.3(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.3, "General rule." (d)

Nothing in this part shall be construed as limiting actions that may be necessary to protect health and safety.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC does not construe the requirements in 10 CFR 835 as limiting any actions that are necessary to protect health and safety.

10 CFR 835.3(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.3, "General rule." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may extend the time interval to conduct the activities required by 10 CFR 835.102, 10 CFR 835.901(e), 10 CFR 835.1202(a), and 10 CFR 835.1202(b) by a period not to exceed 30 days.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.4

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.4, "Radiological units."

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 roentgen equivalent man (rem), including multiples and subdivisions of these units, or other conventional units, such as, dpm, dpm/100 cm² or mass units. The International System (SI) units, becquerel (Bq), gray (Gy), and sievert (Sv), may be provided parenthetically for reference with scientific standards.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC records required by 10 CFR 835 will be maintained in the special units of Ci, rad, rem, or dpm including multiples and subdivisions of these units. The SI units of Bq, Gy, and Sv may be provided parenthetically for reference with scientific standards.

10 CFR 835.101(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (a)

A DOE activity shall be conducted in compliance with a documented RPP as approved by the DOE.

DESCRIPTION OF COMPLIANCE STATUS:

All RAC activities performed under contract to the DOE will be conducted in compliance with this RPP, when approved by the DOE. Future RPP revisions and subsequent DOE approvals will fall under the normal provisions of 10 CFR 835.

10 CFR 835.101(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (b)

The DOE may direct or make modifications to a RPP.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC acknowledges the DOE's authority to direct or make modification to an RPP.

10 CFR 835.101(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (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 ALARA process to occupational exposure.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC RPP is commensurate with the nature of the activities performed under the RAC contract and includes formal plans and measures for applying the ALARA process to occupational exposure.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.101(d)(1)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (d)(1)

The RPP shall specify the existing and/or anticipated operational tasks that are intended to be within the scope of the RPP.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC RPP specifies the existing and/or anticipated operational tasks intended to be within the scope of the RPP.

10 CFR 835.101(d)(2)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (d)(2)

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will perform no tasks outside the scope of the RPP until an update of the RPP is approved by the DOE, except under conditions defined in 10 CFR 835.101(h).

10 CFR 835.101(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (e)

The content of the RPP shall address, but shall not necessarily be limited to, each requirement in this part.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC RPP addresses all applicable requirements in 10 CFR 835.

10 CFR 835.101(f)

STATUS: Conditional Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (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 the amendments to this part published on June 8, 2007, shall be achieved no later than July 9, 2010.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC has committed to plans, schedules, and other measures contained in RPP Sections 1.0 through 13.0 for achieving compliance with the June 8, 2007 amendment, no later than July 9, 2010.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.101(g)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will submit an update of the RPP to the 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.
3. Within 180 days of the effective date of any modifications to this part.

10 CFR 835.101(h)(1)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (h)(1)

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will implement changes, additions, or updates to the RPP without prior DOE approval only if the changes do not decrease the effectiveness of the RPP and the RPP, as changed, continues to meet the requirements of 10 CFR 835.

10 CFR 835.101(h)(2)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (h)(2)

Proposed changes that decrease the effectiveness of the RPP shall not be implemented without submittal to and approval by the Department.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not implement proposed changes to the RPP that decrease the effectiveness of the RPP without submittal to and approval by the DOE.

10 CFR 835.101(i)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.101, "Radiation protection programs." (i)

An initial RPP or an update shall be considered approved 180 days after its submission unless rejected by DOE at an earlier date.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC considers the RPP as approved 180 days following submission to the DOE unless rejected by the DOE at an earlier date.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.102

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.102, "Internal audits."

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC conducts internal audits, reviewing program content and implementation of all functional elements of the RPP no less frequently than every 36 months.

10 CFR 835.103

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.103, "Education, training and skills."

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will ensure individuals responsible for developing and implementing measures necessary for ensuring compliance have the appropriate education, training, and skills to discharge these responsibilities.

10 CFR 835.104

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.104, "Written procedures."

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC has developed and implemented written procedures that are commensurate with the radiological hazards created by the activity and consistent with the education, training, and skills of the individuals exposed to the hazards.

10 CFR 835.202(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.202, "Occupational dose limits for general employees." (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);

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

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).

DESCRIPTION OF COMPLIANCE STATUS:

Except for planned special exposures conducted consistent with 10 CFR 835.204 and emergency exposures authorized in accordance with 10 CFR 835.1302, the RAC controls the occupational dose received by general employees 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)
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)

10 CFR 835.202(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.202, "Occupational dose limits for general employees." (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.

DESCRIPTION OF COMPLIANCE STATUS:

Except doses resulting from planned special exposures conducted in compliance with 10 CFR 835.204 and emergency exposures authorized in accordance with 10 CFR 835.1302, the RAC will include all occupational doses received during the current year when demonstrating compliance with 10 CFR 835.202(a) and 10 CFR 835.207.

10 CFR 835.202(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.202, "Occupational dose limits for general employees." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC does not include doses from therapeutic and diagnostic medical radiation or participation as a subject in medical research programs in dose records or in the assessment of compliance with the occupational exposure limits; however, RAC does include some low-level radon background in the doses calculation process of the Project's radon monitoring program. Based on radon monitoring results from equipment on the mill tailings pile that indicate radon doses to be in excess of 100 mrem in one quarter, it was determined that validation of worker exposure was warranted to ensure no UMTRA Project workers are exceeding 500 mrem in 1 year from radon.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

The Radiological Control Manger made a decision to place radon monitoring devices on workers who routinely spend the majority of their time on top on the mill tailings pile and are likely to be exposed to higher-than-normal radon levels. During this monitoring process, the calculation of radon background cannot accurately be determined. Therefore, radon background is not subtracted during the time the radon monitoring cups are being utilized in the contamination area

10 CFR 835.203(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.203, "Combining internal and external equivalent doses." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC determines the effective dose during a year by summing the effective dose from external exposures and the committed effective dose from intakes during the year.

10 CFR 835.203(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.203, "Combining internal and external equivalent doses." (b)

Determinations of the effective dose shall be made using the radiation and tissue weighting factor values provided in § 835.2.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC determines the effective dose by using the radiation and tissue weighting factor values provided in 10 CFR 835.2.

10 CFR 835.204(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.204, "Planned special exposures." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will authorize a planned special exposure for a radiological worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.202(a), only when 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 10 CFR 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.
3. Joint written approval is received from the appropriate DOE Headquarters program office and the Secretarial Officer responsible for environment, safety, and health matters.

10 CFR 835.204(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.204, "Planned special exposures." (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.

DESCRIPTION OF COMPLIANCE STATUS:

Prior to requesting an individual to participate in an authorized planned special exposure, the RAC will determine the individual's dose from all previous planned special exposures and all doses in excess of the occupational dose limits.

10 CFR 835.204(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.204, "Planned special exposures." (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).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not authorize an individual to receive a planned special exposure that, in addition to the doses determined in 10 CFR 835.204(b), would result in a dose exceeding the following:

1. In a year, the numerical values of the dose limits established at 10 CFR 835.202(a)
2. Over the individual's lifetime, five times the numerical values of the dose limits established at 10 CFR 835.202(a)

10 CFR 835.204(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.204, "Planned special exposures." (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will obtain written consent from each individual involved in a planned special exposure and each written consent will 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.
3. Instructions on the measures to be taken to keep the dose ALARA considering other risks that may be present.

10 CFR 835.204(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.204, "Planned special exposures." (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).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will maintain records of the conduct of a planned special exposure and will submit a written report within 30 days after the planned special exposure to the approving organizations identified in 10 CFR 835.204(a)(3).

10 CFR 835.204(f)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.204, "Planned special exposures." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not use the dose from planned special exposures when controlling future occupational dose of the exposed individual under 10 CFR 835.202(a), but the planned special exposure dose will be included in records and reports required under 10 CFR 835.

10 CFR 835.205(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.205, "Determination of compliance for nonuniform exposure of the skin." (a)

Nonuniform 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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC assesses nonuniform exposures of the skin from X-rays, beta radiation, and/or radioactive material on the skin as specified in 10 CFR 835.205.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.205(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.205, “Determination of compliance for nonuniform exposure of the skin.” (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 nonuniform 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 nonuniform 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 nonuniform 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.

DESCRIPTION OF COMPLIANCE STATUS:

For purposes of demonstrating compliance with 10 CFR 835.202(a)(4), the RAC assessments are conducted as follows:

1. *Area of skin irradiated is 100 cm² or more.* The nonuniform 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 nonuniform 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 nonuniform 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.
 - ii. Not be added to any other equivalent dose to any extremity or skin for the year.

10 CFR 835.206(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.206, “Limits for the embryo/fetus.” (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).

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC 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).

10 CFR 835.206(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.206, "Limits for the embryo/fetus." (b)

Substantial variation above a uniform exposure rate that would satisfy the limits provided in § 835.206(a) shall be avoided.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will avoid substantial variations to the exposure rate to satisfy the limits provided in 10 CFR 835.206(a).

10 CFR 835.206(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.206, "Limits for the embryo/fetus." (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.

DESCRIPTION OF COMPLIANCE STATUS:

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 RAC will not assign the declared pregnant worker to tasks where additional occupational exposure is likely during the remaining gestation period.

10 CFR 835.207

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.207, "Occupational dose limits for minors."

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).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not occupationally expose any minor to radiation and/or radioactive material at a RAC-operated site or facility such that the minor exceeds 0.1 rem (0.001 Sv) total effective dose in a year and 10 percent of the occupational dose limits specified at 10 CFR 835.202(a)(3) and 10 CFR 835.202(a)(4).

10 CFR 835.208

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.208, "Limits for members of the public entering a controlled area."

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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not expose any member of the public to radiation and/or radioactive material during access to a controlled area at a RAC-operated site or facility such that the total effective dose equivalent exceeds 0.1 rem (0.001 Sv) in a year.

10 CFR 835.209(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.209, "Concentrations of radioactive material in air." (a)

The DAC values given in appendices A and C of this part shall be used in the control of occupational exposures to airborne radioactive material.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC uses the DAC values given at 10 CFR 835 Appendices A and C in the control of occupational exposures to airborne radioactive material.

10 CFR 835.209(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.209, "Concentrations of radioactive material in air." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC bases its estimation of internal dose on air concentration values, because there is a technical shortfall in the uranium bioassay process. The air concentration values have been far more accurate than the uranium bioassay program; however, RAC maintains the use of both programs as useful tools in the development of internal dose estimates and as personnel monitoring process.

10 CFR 835.401(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.401, "General requirements." (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC monitors individuals and areas to:

1. Demonstrate compliance with the regulations in 10 CFR 835.
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.
6. Identify and control potential sources of individual exposure to radiation and/or radioactive material, as is necessary.

10 CFR 835.401(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.401, "General requirements." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The instruments and equipment used by the RAC for monitoring are:

1. Periodically maintained and calibrated on an established frequency.
2. Appropriate for the types, levels, and energies of the radiation encountered.
3. Appropriate for existing environmental conditions.
4. Routinely tested for operability.

10 CFR 835.402(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.402, "Individual monitoring." (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

For the purpose of monitoring individual exposures to external radiation, the RAC provides and requires the use of personnel dosimeters 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 10 CFR 835.206(a).
3. Occupationally exposed minors likely to receive a dose in excess of 50 percent of the applicable limits at 10 CFR 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 10 CFR 835.208 in a year from external sources.
5. Individuals entering a high or very high radiation area.

10 CFR 835.402(b)(1)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.402, "Individual monitoring." (b)(1)

External dose monitoring programs implemented to demonstrate compliance with § 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 DOELAP for Personnel Dosimetry;

DESCRIPTION OF COMPLIANCE STATUS:

The RAC personnel external dosimetry program is adequate to demonstrate compliance with 10 CFR 835.402 (a) and the program conforms to the requirements of the DOELAP for Personnel Dosimetry and is current in its DOELAP Accreditation.

10 CFR 835.402(b)(2)

STATUS: N/A

REQUIREMENT STATEMENT:

10 CFR 835.402, "Individual monitoring." (b)(2)

External dose monitoring programs implemented to demonstrate compliance with 10 CFR 835.402(a) shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part and shall be:

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 DOELAP for Personnel Dosimetry.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not seek this determination.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.402(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.402, "Individual monitoring." (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.

DESCRIPTION OF COMPLIANCE STATUS:

For the purpose of monitoring individual exposures to internal radiation, the RAC conducts internal dosimetry programs (including routine bioassay programs) for:

1. Radiological workers who, under typical conditions, are likely to receive a committed effective dose of:
 - i. 0.5 rem (0.005 Sv) or more from all occupational intakes of radon while in a controlled area.
 - ii. 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 10 CFR 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 10 CFR 835.207 from all radionuclide intakes in a year.
4. Members of the public entering a controlled area likely to receive a dose in excess of 50 percent of the limit stated at 10 CFR 835.208 from all radionuclide intakes in a year.

10 CFR 835.402(d)(1)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.402, "Individual monitoring." (d)(1)

Internal dose monitoring programs implemented to demonstrate compliance with 10 CFR 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 DOELAP for Radiobioassay;

DESCRIPTION OF COMPLIANCE STATUS:

The RAC personnel internal dosimetry program is adequate to demonstrate compliance with 10 CFR 835.402 (c) and the program conforms to the requirements of the DOELAP for Radiobioassay.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.402(d)(2)

STATUS: N/A

REQUIREMENT STATEMENT:

10 CFR 835.402, "Individual monitoring." (d)(2)

Internal dose monitoring programs implemented to demonstrate compliance with 10 CFR 835.402(c) shall be adequate to demonstrate compliance with the dose limits established in subpart C of this part and shall be:

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not seek this determination.

10 CFR 835.403(a)(1)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.403, "Air monitoring." (a)(1)

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will perform monitoring of airborne radioactivity where an individual is likely to receive an exposure of 40 or more DAC-hrs in a year or 200 or more DAC-hrs in a year from occupational exposure to radon, thoron, and their progeny while in a controlled area.

10 CFR 835.403(a)(2)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.403, "Air monitoring." (a)(2)

Monitoring of airborne radioactivity shall be performed:

2. As necessary to characterize the airborne radioactivity hazard where respiratory protective devices for protection against airborne radionuclides have been prescribed.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC performs monitoring of airborne radioactivity as necessary to characterize the airborne radioactivity hazard where respiratory protective devices for protection against airborne radionuclides have been prescribed.

10 CFR 835.403(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.403, "Air monitoring." (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

Currently, RAC has no real-time air monitoring in operation. The Project radioactive source term has been well defined and is considered low level occurring technologically-enhanced, naturally-occurring radioactive material. Based on the type of respiratory protection used on this Project, it is not feasible to exceed the protection factor based on long-term evaluation of the radioparticulate levels in the only airborne radioactivity area located on the Project; therefore, real-time monitoring with an early-warning capability, such as using continuous air monitors with alarms, is not used on the Project.

10 CFR 835.405(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.405, "Receipt of packages containing radioactive material." (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.

DESCRIPTION OF COMPLIANCE STATUS:

When 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, the RAC will either take possession of the package when the carrier offers it for delivery or make arrangements to receive notification as soon as practicable after arrival of the package at the carrier's terminal and take possession of the package expeditiously after receiving such notification.

10 CFR 835.405(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.405, "Receipt of packages containing radioactive material." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will, upon receipt from radioactive material transportation, monitor the external surfaces of packages known to contain radioactive material 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 49 CFR 172.436 through 49 CFR 440).
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).
3. Has evidence of degradation, such as packages that are crushed, wet, or damaged.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.405(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.405, "Receipt of packages containing radioactive material." (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.

DESCRIPTION OF COMPLIANCE STATUS:

In reference to the monitoring required by 10 CFR 835.405(b), the RAC will include measurements of removable contamination levels, unless the package contains only special form (as defined at 10 CFR 71.4) or gaseous radioactive material and will include measurements of the radiation levels, if the package contains a Type B quantity (as defined at 10 CFR 71.4) of radioactive material.

10 CFR 835.405(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.405, "Receipt of packages containing radioactive material." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will complete the monitoring required by 10 CFR 835.405(b) 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.

10 CFR 835.405(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.405, "Receipt of packages containing radioactive material." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may choose not to perform monitoring pursuant to 10 CFR 835.405(b) for packages transported on a DOE site and 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.

10 CFR 835.501(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.501, "Radiological areas." (a)

Personnel entry control shall be maintained for each radiological area.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC maintains control of personnel entering each radiological area.

10 CFR 835.501(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.501, "Radiological areas." (b)

The degree of control shall be commensurate with existing and potential radiological hazards within the area.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC maintains the degree of personnel entry control (either administrative or engineered) so that it is commensurate with the existing and potential radiological hazards within the area.

10 CFR 835.501(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.501, "Radiological areas." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC entry control program consists of one or more of the following methods:

1. Signs and barricades
2. Control devices on entrances
3. Conspicuous visual and/or audible alarms
4. Locked entrance ways
5. Administrative controls

10 CFR 835.501(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.501, "Radiological areas." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC requires written authorizations to control entry into and perform work within radiological areas that specify radiation protection measures commensurate with the existing and potential hazards.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.501(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.501, "Radiological areas." (e)

No control(s) shall be installed at any radiological area exit that would prevent rapid evacuation of personnel under emergency conditions.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will not install any controls at any radiological area exit that would prevent rapid evacuation of personnel under emergency conditions.

10 CFR 835.502(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.502, "High and very high radiation areas." (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.

DESCRIPTION OF COMPLIANCE STATUS:

Currently, there are no high and very high radiation areas on the Project, and it is highly unlikely there would ever be one on the Project based on the source term.

If the RAC ascertains the presence of a high and very high radiation areas, the RAC will, for each entry into a high radiation area, monitor the area as necessary during access to determine the exposure rates to which the individuals are exposed, and will monitor each individual using a supplemental dosimetry device or other means capable of providing an immediate estimate of the individual's integrated equivalent dose during the entry.

10 CFR 835.502(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.502, "High and very high radiation areas.

Currently there are no high and very high radiation areas on the Project, and it is highly unlikely there would ever be one on the Project based on the source term.

If RAC ascertains the present of a high and very high radiation areas, RAC will:

(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 Sv) 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;

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

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.

DESCRIPTION OF COMPLIANCE STATUS:

Currently, there are no high and very high radiation areas on the Project, and it is highly unlikely there would ever be one on the Project based on the source term.

The RAC uses one or more of the following features at each entrance or access point to a high radiation area:

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. During periods when access to the area is required, positive control over each entry is maintained (i.e., entryways that are locked)
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

10 CFR 835.502(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.502, "High and very high radiation areas.

Currently, there are no high and very high radiation areas on the Project, and it is highly unlikely there would ever be one on the Project based on the source term.

(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.

DESCRIPTION OF COMPLIANCE STATUS:

In addition to the requirements of 10 CFR 835.502(b), the RAC will implement additional measures to ensure individuals are not able to gain unauthorized or inadvertent access to very high radiation areas.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.502(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.502, "High and very high radiation areas." (d)

No control(s) shall be established in a high or very high radiation area that would prevent rapid evacuation of personnel.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will implement no controls in a high or very high radiation area that would prevent rapid evacuation of personnel.

10 CFR 835.601(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.601, "General requirements." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC uses signs and labels with radiation symbols that are either black or magenta imposed upon yellow backgrounds.

10 CFR 835.601(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.601, "General requirements." (b)

Signs required by this subpart shall be clearly and conspicuously posted and may include radiological protection instructions.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC posts signs that are clear and conspicuous and may include radiological protection instructions.

10 CFR 835.601(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.601, "General requirements." (c)

The posting and labeling requirements in this subpart may be modified to reflect the special considerations of DOE activities conducted at private residences or businesses. Such modifications shall provide the same level of protection to individuals as the existing provisions in this subpart.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may modify the posting and labeling requirements to reflect the special considerations of DOE activities conducted at private residences or businesses. If the RAC makes modifications to posting requirements, the modifications will provide the same level of protection to individuals as the provisions in 10 CFR 835 Subpart G.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.602(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.602, “Controlled Areas.” (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 Sv) in a year.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will ensure each access point to a controlled area (as defined in 10 CFR 835.2) is posted whenever radiological areas or radioactive material areas exist in the area. The RAC understands that 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 Sv) in a year from sources other than occupational exposure to radon, thoron, and their progeny.

10 CFR 835.602(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.602, “Controlled Areas.” (b)

Signs used for this purpose may be selected by the contractor to avoid conflict with local security requirements.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may select signs (that are used for ensuring access points to controlled areas are posted) that avoid conflict with local security requirements.

10 CFR 835.603

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.603, “Radiological areas and radioactive material areas.”

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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC posts conspicuous signs at each access point to radiological areas and radioactive material areas (as defined in 10 CFR 835.2), bearing the wording provided in 10 CFR 835.603, as described below:

- 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.

10 CFR 835.604(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.604, “Exceptions to posting requirements.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may except areas from the posting requirements of 10 CFR 835.603 for periods of less than 8 continuous hrs when placed under continuous observation and control of an individual knowledgeable of, and empowered to implement, required access and exposure control measures.

10 CFR 835.604(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.604, “Exceptions to posting requirements.” (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 in an accelerator).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may except areas from the radioactive material area posting requirements of 10 CFR 835.603(g) when:

1. Posted in accordance with 10 CFR 835.603(a) through (f).
2. Each item or container of radioactive material is labeled in accordance with 10 CFR 835 Subpart G such that individuals entering the area are made aware of the hazard.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

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 in an accelerator).

10 CFR 835.604(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.604, “Exceptions to posting requirements.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

For areas containing only packages received from radioactive material transportation labeled and in non-degraded condition, the RAC need not post these areas in accordance with 10 CFR 835.603 until the packages are monitored in accordance with 10 CFR 835.405.

10 CFR 835.605

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.605, “Labeling items and containers.”

Except as provided at § 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.

DESCRIPTION OF COMPLIANCE STATUS:

Except as provided in 10 CFR 835.606, the RAC will ensure each item or container of radioactive material will bear a durable, clearly visible label bearing the standard radiation warning trefoil and the words “Caution, Radioactive Material” or “Danger, Radioactive Material.” The label will 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.

10 CFR 835.606(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.606, “Exceptions to labeling requirements.” (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

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may except items and containers from the radioactive material labeling requirements of 10 CFR 835.605 when:

1. Used, handled, or stored in areas posted and controlled in accordance with 10 CFR 835 Subpart G and sufficient information is provided to permit individuals to take precautions to avoid or control exposures.
2. The quantity of radioactive material is less than one tenth of the values specified in 10 CFR 835 Appendix E and less than 0.1 Ci.
3. Packaged, labeled, and marked in accordance with the regulations of the DOT or DOE orders governing radioactive material transportation.
4. Inaccessible or accessible only to individuals authorized to handle, use them, or to work in the vicinity.
5. Installed in manufacturing, process, or other equipment, such as reactor components, piping, and tanks.
6. The radioactive material consists solely of nuclear weapons or their components.

10 CFR 835.606(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.606, "Exceptions to labeling requirements." (b)

Radioactive material labels applied to sealed radioactive sources may be excepted from the color specifications of § 835.601(a).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may except the radioactive material labels applied to sealed radioactive sources from the color specifications of 10 CFR 835.601(a).

10 CFR 835.701(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.701, "General provisions." (a)

Records shall be maintained to document compliance with this part and with radiation protection programs required by § 835.101.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC maintains records to document compliance with 10 CFR 835.701(a) and with radiation protection programs required by 10 CFR 835.101.

10 CFR 835.701(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.701, "General provisions." (b)

Unless otherwise specified in this subpart, records shall be retained until final disposition is authorized by DOE.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC maintains required records until final disposition is authorized by the DOE.

10 CFR 835.702(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will maintain records, except as authorized by 10 CFR 835.702(b), 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 10 CFR 835.402, and authorized emergency exposures.

10 CFR 835.702(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (b)

Recording of the nonuniform 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).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may choose to not record the nonuniform equivalent dose to the skin if the dose is less than 2 percent of the limit specified for the skin at 10 CFR 835.202(a)(4). The RAC may choose not to record internal dose (committed effective dose or committed equivalent dose) for any monitoring result estimated to correspond to an individual receiving less than 0.01 rem (0.1 mSv) committed effective dose. The RAC will maintain the bioassay or air monitoring result used to make the estimate in accordance with 10 CFR 835.703(b) and the unrecorded internal dose estimated for any individual in a year shall not exceed the applicable monitoring threshold at 10 CFR 835.402(c).

10 CFR 835.702(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (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;

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC individual monitoring records are:

1. Sufficient to evaluate compliance with 10 CFR 835 Subpart C.
2. Sufficient to provide dose information necessary to complete reports required by 10 CFR 835 Subpart I.
3. Maintained to 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
 - iv. The equivalent dose to the extremities
4. Maintained to 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
 - iii. Identity of radionuclides
5. Maintained to 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
 - iii. Cumulative total effective dose
6. Maintained to include the equivalent dose to the embryo/fetus of a declared pregnant worker.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.702(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (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.

DESCRIPTION OF COMPLIANCE STATUS:

To demonstrate compliance with 10 CFR 835.202(a), the RAC obtains all occupational exposures received during the current year, except for doses resulting from planned special exposures conducted in compliance with 10 CFR 835.204 and emergency exposures authorized in accordance with 10 CFR 835.1302(d). If the RAC cannot obtain complete records, then the RAC may accept and use a written estimate, signed by the individual, to demonstrate compliance.

10 CFR 835.702(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (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.

DESCRIPTION OF COMPLIANCE STATUS:

For radiological workers whose occupational dose is monitored in accordance with 10 CFR 835.402, the RAC will make reasonable efforts to obtain complete records of prior years' occupational internal and external doses.

10 CFR 835.702(f)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (f)

The records specified in this section that are identified with a specific individual shall be readily available to that individual.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC makes the records specified in 10 CFR 835.702 that are identified with a specific individual readily available to that individual.

10 CFR 835.702(g)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (g)

Data necessary to allow future verification or reassessment of the recorded doses shall be recorded.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC records data necessary to allow future verification or reassessment of the recorded doses.

10 CFR 835.702(h)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.702, "Individual monitoring records." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will transfer all records required by 10 CFR 835.702 to the DOE upon cessation of activities at sites that could cause exposure to individuals.

10 CFR 835.703

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.703, "Other monitoring records."

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).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC documents and maintains the:

- a. Results of monitoring for radiation and radioactive material as required by 10 CFR 835 Subpart E and 10 CFR 835 Subpart L, except for monitoring required by 10 CFR 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 10 CFR 835.1101.
- d. Results of maintenance and calibration performed on instruments and equipment as required by 10 CFR 835.401(b).

10 CFR 835.704(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.704, "Administrative records." (a)

Training records shall be maintained, as necessary, to demonstrate compliance with § 835.901.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC and TAC maintains training records which demonstrate compliance with 10 CFR 835.901.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.704(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.704, “Administrative records.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC documents actions taken to maintain occupational exposures ALARA, including the actions required for this purpose by 10 CFR 835.101, as well as facility design and control actions required by 10 CFR 835.1001, 10 CFR 835.1002, and 10 CFR 835.1003.

10 CFR 835.704(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.704, “Administrative records.” (c)

Records shall be maintained to document the results of internal audits and other reviews of program content and implementation.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC and TAC documents and maintains records of the results of internal audits and other reviews of program content and implementation.

10 CFR 835.704(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.704, “Administrative records.” (d)

Written declarations of pregnancy, including the estimated date of conception, and revocations of declarations of pregnancy shall be maintained.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC maintains written declarations of pregnancy, including the estimated date of conception, and revocations of declarations of pregnancy.

10 CFR 835.704(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.704, “Administrative records.” (e)

Changes in equipment, techniques, and procedures used for monitoring shall be documented.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC documents changes in equipment, techniques, and procedures used for monitoring.

10 CFR 835.704(f)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.704, “Administrative records.” (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC maintains records as necessary to demonstrate compliance with the requirements of 10 CFR 835.1201 and 10 CFR 835.1202 for sealed radioactive source control, inventory, and source leak tests.

10 CFR 835.801(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.801, "Reports to individuals." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC reports radiation exposure data for individuals monitored in accordance with 10 CFR 835.402 as specified in 10 CFR 835.801. The RAC includes information and data required under 10 CFR 835.702(c). The RAC provides each notification and report in writing and includes: 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.

10 CFR 835.801(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.801, "Reports to individuals." (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.

DESCRIPTION OF COMPLIANCE STATUS:

Upon the request from an individual terminating employment, the RAC provides records of exposure to that individual as soon as the data are available, but not later than 90 days after termination. The RAC provides a written estimate of the radiation dose received by that employee based on available information at the time of termination, if requested by the terminating individual to do so.

10 CFR 835.801(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.801, "Reports to individuals." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will provide, on an annual basis, a radiation dose report to each individual monitored during the year at the site or facility in accordance with 10 CFR 835.402.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.801(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.801, "Reports to individuals." (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).

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will make available detailed information concerning any individual's exposure to that individual upon request of that individual, consistent with the provisions of the Privacy Act, 5 USC 552a (*United States Code*).

10 CFR 835.801(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.801, "Reports to individuals." (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.

DESCRIPTION OF COMPLIANCE STATUS:

When the RAC is required to report to the DOE, pursuant to DOE requirements for occurrence reporting and processing, any exposure of an individual to radiation and/or radioactive material, or planned special exposure in accordance with 10 CFR 835.204(e), the RAC will also provide that individual with a report on his or her exposure data included therein. The RAC will transmit this report at a time not later than the transmittal to the DOE.

10 CFR 835.901(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.901, "Radiation safety training." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC ensures radiation safety training on the topics established at 10 CFR 835.901(c) commensurate with the hazards in the area and the required controls are provided

1. Before being permitted unescorted access to controlled areas.
2. Before receiving occupational dose during access to controlled areas at a RAC-operated site or facility.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.901(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.901, "Radiation safety training." (b)

Each individual shall demonstrate knowledge of the radiation safety training topics established at § 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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC requires each individual to demonstrate knowledge of the radiation safety training topics established in 10 CFR 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.
2. Before performing unescorted assignments as a radiological worker.

10 CFR 835.901(c)(1-6)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.901, "Radiation safety training." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC ensures radiation safety training includes 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 10 CFR 835.101
6. Individual exposure reports that may be requested in accordance with 10 CFR 835.801

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.901(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.901, “Radiation safety training.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

When the RAC uses an escort in lieu of training in accordance with 10 CFR 835.901(a) and 10 CFR 835.901(b), the escort will have completed radiation safety training, examinations, and performance demonstrations required for entry to the area and performance of the work. The escort will ensure that all escorted individuals comply with this RPP.

10 CFR 835.901(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.901, “Radiation safety training.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will ensure radiation safety training is 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. The RAC ensures training for individuals subject to the requirements of 10 CFR 835.901(b); this training requires the successful completion of an examination.

10 CFR 835.1001(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1001, “Design and control.” (a)

Measures shall be taken to maintain radiation exposure in controlled areas ALARA through engineered and administrative controls. The primary methods used shall be engineered controls (e.g., confinement, ventilation, remote handling, and shielding). Administrative controls shall be employed only as supplemental methods to control radiation exposure.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will apply measures to maintain radiation exposure in controlled areas ALARA through engineered and administrative controls. The primary methods used by the RAC are engineered controls (e.g., confinement, ventilation, remote handling, shielding). The RAC uses administrative controls only as supplemental methods to control radiation exposure.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.1001(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1001, “Design and control.” (b)

For specific activities where use of engineered controls is demonstrated to be impractical, administrative controls shall be used to maintain radiation exposures ALARA.

DESCRIPTION OF COMPLIANCE STATUS:

For specific activities where use of physical design features is demonstrated to be impractical, the RAC will use administrative controls to maintain radiation exposures ALARA.

10 CFR 835.1002(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1002, “Facility design and modifications.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

During the design of new facilities or modification of existing facilities, the RAC will use optimization methods to assure that occupational exposure is maintained ALARA when developing or justifying facility design and physical controls.

10 CFR 835.1002(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1002, “Facility design and modifications.” (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 hrs per year) shall be to maintain exposure levels below an average of 0.5 millirem (5 micro [μ]Sv) per hr 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.

DESCRIPTION OF COMPLIANCE STATUS:

During the design of new facilities or modification of existing facilities, the design objective used by the RAC, for controlling personnel exposure from external sources of radiation in areas of continuous occupational occupancy (2000 hours per year) is to maintain exposure levels below an average of 0.5 mrem [5μ Sv] per hr and as far below this average as is reasonably achievable. The design objective, used by the RAC, for exposure rates for potential exposure to a radiological worker where occupancy differs from the 2000 hrs per year is ALARA and to not exceed 20 percent of the applicable standards in 10 CFR 835.202.

Appendix A. Radiation Protection Program Compliance Statements (continued)

10 CFR 835.1002(c)

STATUS: Conditional Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1002, “Facility design and modifications.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

Regarding the control of airborne radioactive material, the design objective, used by the RAC under normal conditions, is 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. In addition to confinement and ventilation, which are used where practical and appropriate, the RAC uses dust suppression and material handling techniques designed to maintain airborne radioactive material to levels that are ALARA.

10 CFR 835.1002(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1002, “Facility design and modifications.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

During the design of new facilities or modification of existing facilities, the RAC will select materials which include features that facilitate operations, maintenance, decontamination, and decommissioning.

10 CFR 835.1003

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1003, “Workplace controls.”

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
- b. The ALARA process is utilized for personnel exposures to ionizing radiation.

DESCRIPTION OF COMPLIANCE STATUS:

During routine operations, the combination of engineered and administrative controls the RAC uses will limit the occupational dose to general employees to less than the limits established at 10 CFR 835.202 and will provide that the ALARA process is utilized for personnel exposures to ionizing radiation.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

10 CFR 835.1101(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1101, “Control of material and equipment.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

Except as provided in 10 CFR 835.1101(b) and 10 CFR 835.1101(c), the RAC will not release material and equipment in contamination areas, high contamination areas, and airborne radioactivity areas to a controlled area if:

1. Removable surface contamination levels on accessible surfaces exceed the removable surface contamination values specified in 10 CFR 835 Appendix D.
2. Prior use suggests that the removable surface contamination levels on inaccessible surfaces are likely to exceed the removable surface contamination values specified in 10 CFR 835 Appendix D.

10 CFR 835.1101(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1101, “Control of material and equipment.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may choose to conditionally release material and equipment exceeding the removable surface contamination values specified in 10 CFR 835 Appendix D for movement on site from one radiological area for immediate placement in another radiological area, if appropriate monitoring is performed and appropriate controls for the movement are established and exercised.

10 CFR 835.1101(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1101, “Control of material and equipment.” (c)

Material and equipment with fixed contamination levels that exceed the total 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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may choose to release and use material and equipment with fixed contamination levels that exceed the total surface contamination values specified in 10 CFR 835 Appendix D 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 10 CFR 835 Appendix D.
2. The material or equipment is routinely monitored and clearly marked or labeled to alert personnel of the contaminated status.

10 CFR 835.1102(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1102, "Control of areas." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC maintains and verifies appropriate controls which prevent the inadvertent transfer of removable contamination to locations outside of radiological areas under normal operating conditions.

10 CFR 835.1102(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1102, "Control of areas." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC controls any area in which contamination levels exceed the values specified in 10 CFR 835 Appendix D in a manner commensurate with the physical and chemical characteristics of the contaminant, the radionuclides present, and the fixed and removable contamination levels.

10 CFR 835.1102(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1102, "Control of areas." (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

For areas, located outside of radiological areas, which are 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 10 CFR 835 Appendix D, the RAC ensures that:

1. The area is routinely monitored to ensure the removable surface contamination level remains below the removable surface contamination values specified in 10 CFR 835 Appendix D.
2. The area is conspicuously marked to warn individuals of the contaminated status.

10 CFR 835.1102(d)**STATUS: Full Compliance**

REQUIREMENT STATEMENT:

10 CFR 835.1102, "Control of areas." (d)

Individuals exiting contamination, high contamination, or airborne radioactivity areas shall be monitored, as appropriate, for the presence of surface contamination.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will monitor individuals exiting contamination, high contamination, or airborne radioactivity areas for the presence of surface contamination, as appropriate.

10 CFR 835: 1102 (e)**STATUS: Full Compliance**

REQUIREMENT STATEMENT:

10 CFR 835.1102, "Control of areas." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC requires protective clothing for entry into areas in which removable contamination exists at levels exceeding the removable surface contamination values specified in 10 CFR 835 Appendix D.

10 CFR 835.1201**STATUS: Full Compliance**

REQUIREMENT STATEMENT:

10 CFR 835.1201, "Sealed radioactive source control."

Sealed radioactive sources shall be used, handled, and stored in a manner commensurate with the hazards associated with the operations involving the sources.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will use, handle, and store sealed radioactive sources in a manner commensurate with the hazards associated with the operations involving the sources.

10 CFR 835.1202(a)**STATUS: Full Compliance**

REQUIREMENT STATEMENT:

10 CFR 835.1202, "Accountable sealed radioactive sources." (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

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

3. Establish the adequacy of storage locations, containers, and devices.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will inventory each accountable sealed radioactive source at intervals not to exceed 6 months. This inventory will:

1. Establish the physical location of each accountable sealed radioactive source.
2. Verify the presence and adequacy of associated postings and labels.
3. Establish the adequacy of storage locations, containers, and devices.

10 CFR 835.1202(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1202, "Accountable sealed radioactive sources." (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 .

DESCRIPTION OF COMPLIANCE STATUS:

Except for sealed radioactive sources consisting solely of gaseous radioactive material or tritium, the RAC will perform a source leak test on each accountable sealed radioactive source upon receipt, when damage is suspected, and at intervals not to exceed 6 months. The leak tests performed by the RAC are capable of detecting radioactive material leakage equal to or exceeding 0.005 μCi .

10 CFR 835.1202(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1202, "Accountable sealed radioactive sources." (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.

DESCRIPTION OF COMPLIANCE STATUS:

Notwithstanding the requirements of 10 CFR 835.1202(b), the RAC does not subject an accountable sealed radioactive source to periodic source leak testing if that source has been removed from service. In this instance, the RAC will ensure that such sources are stored in a controlled location, subject to periodic inventory as required by 10 CFR 835.1202(a), and subject to source leak testing prior to being returned to service.

10 CFR 835.1202(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1202, "Accountable sealed radioactive sources." (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.

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

DESCRIPTION OF COMPLIANCE STATUS:

Notwithstanding the requirements of 10 CFR 835.1202(a) and 10 CFR 835.1202 (b), the RAC does not subject an accountable sealed radioactive source to periodic inventory and source leak testing if that source is located in an area that is unsafe for human entry or otherwise inaccessible.

10 CFR 835.1202(e)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1202, “Accountable sealed radioactive sources.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will control an accountable sealed radioactive source found to be leaking radioactive material in a manner that minimizes the spread of radioactive contamination.

10 CFR 835.1301(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1301, “General provisions.” (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC may choose to allow a general employee, whose occupational dose has exceeded the numerical value of any of the limits specified in 10 CFR 835.202 as a result of an authorized emergency exposure, to return to work in radiological areas during the current year when 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.
3. The affected employee agrees to return to radiological work.

10 CFR 835.1301(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1301, “General provisions.” (b)

All doses exceeding the limits specified in § 835.202 shall be recorded in the affected individual’s occupational dose record.

Appendix A. Radiation Protection Program Compliance Statements (continued)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC records all doses exceeding the limits specified in 10 CFR 835.202 in the affected individual's occupational dose record.

10 CFR 835.1301(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1301, "General provisions." (c)

When the conditions under which a dose was received in excess of the limits specified in § 835.202, except those doses received in accordance with § 835.204, have been eliminated, operating management shall notify the Head of the responsible DOE field organization.

DESCRIPTION OF COMPLIANCE STATUS:

When the conditions under which a dose was received in excess of the limits specified in 10 CFR 835.202, except those doses received in accordance with 10 CFR 835.204, have been eliminated, the RAC management will notify the Head of the responsible DOE field organization.

10 CFR 835.1301(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1301, "General provisions." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will have approval from the DOE prior to resuming operations which have been suspended as a result of a dose in excess of the limits specified in 10 CFR 835.202, except those received in accordance with 10 CFR 835.204.

10 CFR 835.1302(a)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1302, "Emergency exposure situations." (a)

The risk of injury to those individuals involved in rescue and recovery operations shall be minimized.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will take steps to minimize the risk of injury to those individuals involved in rescue and recovery operations.

10 CFR 835.1302(b)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1302, "Emergency exposure situations." (b)

Operating management shall weigh actual and potential risks against the benefits to be gained.

Appendix A. Radiation Protection Program Compliance Statements (continued)

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will weigh actual and potential risks against the benefits to be gained.

10 CFR 835.1302(c)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1302, "Emergency exposure situations." (c)

No individual shall be required to perform rescue action that might involve substantial personal risk.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will only use volunteers to perform rescue actions that might involve substantial personal risk.

10 CFR 835.1302(d)

STATUS: Full Compliance

REQUIREMENT STATEMENT:

10 CFR 835.1302, "Emergency exposure situations." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The RAC will train each individual authorized to perform emergency actions that are likely to result in occupational doses exceeding the values of the limits provided at 10 CFR 835.202(a) in accordance with 10 CFR 835.901(b) and will brief them beforehand on the known or anticipated hazards to which they will be exposed.

10 CFR 835.1303

STATUS: N/A

REQUIREMENT STATEMENT:

10 CFR 835.1303 has been reserved.

DESCRIPTION OF COMPLIANCE STATUS:

The section does not require a compliance statement.

10 CFR 835.1304(a)

STATUS: N/A

REQUIREMENT STATEMENT:

10 CFR 835.1304, "Nuclear accident dosimetry." (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.

DESCRIPTION OF COMPLIANCE STATUS:

The Moab UMTRA site does not contain configurable quantities of fissile materials.

10 CFR 835.1304(b)

STATUS: N/A

REQUIREMENT STATEMENT:

10 CFR 835.1304, "Nuclear accident dosimetry." (b)

Appendix A. Radiation Protection Program Compliance Statements (*continued*)

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.

DESCRIPTION OF COMPLIANCE STATUS:

The Moab UMTRA site does not contain configurable quantities of fissile materials.

Attachment 1.
10 CFR 835.2 Definitions

Attachment 1. 10 CFR 835.2 Definitions

Department of Energy

§ 835.2

(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.

[58 FR 65485, Dec. 14, 1993, as amended at 63 FR 59679, Nov. 4, 1998; 71 FR 68733, Nov. 28, 2006; 72 FR 31922, June 8, 2007]

§ 835.2 Definitions.

(a) As used in this part:

Accountable sealed radioactive source means a sealed radioactive source having a half-life equal to or greater than 30 days and an isotopic activity equal to or greater than the corresponding value provided in appendix E of this part.

Activity Median Aerodynamic Diameter (AMAD) means a particle size in an aerosol where fifty percent of the activity in the aerosol is associated with particles of aerodynamic diameter greater than the AMAD.

Airborne radioactive material or airborne radioactivity means radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors, or gases.

Airborne radioactivity area means any area, accessible to individuals, where:

(1) The concentration of airborne radioactivity, above natural background, exceeds or is likely to exceed the derived air concentration (DAC) values listed in appendix A or appendix C of this part; or

(2) An individual present in the area without respiratory protection could receive an intake exceeding 12 DAC-hours in a week.

ALARA means "As Low As is Reasonably Achievable," which is the approach to radiation protection to manage and control exposures (both individual and collective) to the work force and to the general public to as low as is reasonable, taking into account social, technical, economic, practical, and public policy considerations. As used in this part, ALARA is not a dose limit but a process which has the objective of attaining doses as far below

the applicable limits of this part as is reasonably achievable.

Annual limit on intake (ALI) means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man (ICRP Publication 23) that would result in a committed effective dose of 5 rems (0.05 sieverts (Sv)) (1 rem = 0.01 Sv) or a committed equivalent dose of 50 rems (0.5 Sv) to any individual organ or tissue. ALI values for intake by ingestion and inhalation of selected radionuclides are based on International Commission on Radiological Protection Publication 68, *Dose Coefficients for Intakes of Radionuclides by Workers*, published July, 1994 (ISBN 0 08 042651 4). This document is available from Elsevier Science Inc., Tarrytown, NY.

Authorized limit means a limit on the concentration of residual radioactive material on the surfaces or within the property that has been derived consistent with DOE directives including the as low as is reasonably achievable (ALARA) process requirements, given the anticipated use of the property and has been authorized by DOE to permit the release of the property from DOE radiological control.

Background means radiation from:

(1) Naturally occurring radioactive materials which have not been technologically enhanced;

(2) Cosmic sources;

(3) Global fallout as it exists in the environment (such as from the testing of nuclear explosive devices);

(4) Radon and its progeny in concentrations or levels existing in buildings or the environment which have not been elevated as a result of current or prior activities; and

(5) Consumer products containing nominal amounts of radioactive material or producing nominal amounts of radiation.

Bioassay means the determination of kinds, quantities, or concentrations, and, in some cases, locations of radioactive material in the human body, whether by direct measurement or by analysis and evaluation of radioactive materials excreted or removed from the human body.

Attachment 1. 10 CFR 835.2 Definitions (*continued*)

§ 835.2

10 CFR Ch. III (1–1–10 Edition)

Calibration means to adjust and/or determine either:

(1) The response or reading of an instrument relative to a standard (*e.g.*, primary, secondary, or tertiary) or to a series of conventionally true values; or

(2) The strength of a radiation source relative to a standard (*e.g.*, primary, secondary, or tertiary) or conventionally true value.

Contamination area means any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed the removable surface contamination values specified in appendix D of this part, but do not exceed 100 times those values.

Controlled area means any area to which access is managed by or for DOE to protect individuals from exposure to radiation and/or radioactive material.

Declared pregnant worker means a woman who has voluntarily declared to her employer, in writing, her pregnancy for the purpose of being subject to the occupational dose limits to the embryo/fetus as provided in §835.206. This declaration may be revoked, in writing, at any time by the declared pregnant worker.

Derived air concentration (DAC) means, for the radionuclides listed in appendix A of this part, the airborne concentration that equals the ALI divided by the volume of air breathed by an average worker for a working year of 2000 hours (assuming a breathing volume of 2400 m³). For the radionuclides listed in appendix C of this part, the air immersion DACs were calculated for a continuous, non-shielded exposure via immersion in a semi-infinite cloud of radioactive material. Except as noted in the footnotes to appendix A of this part, the values are based on dose coefficients from International Commission on Radiological Protection Publication 68, *Dose Coefficients for Intakes of Radionuclides by Workers*, published July, 1994 (ISBN 0 08 042651 4) and the associated ICRP computer program, *The ICRP Database of Dose Coefficients: Workers and Members of the Public*, (ISBN 0 08 043 8768). These materials are available from Elsevier Science Inc., Tarrytown, NY.

Derived air concentration-hour (DAC-hour) means the product of the concentration of radioactive material in

air (expressed as a fraction or multiple of the DAC for each radionuclide) and the time of exposure to that radionuclide, in hours.

Deterministic effects means effects due to radiation exposure for which the severity varies with the dose and for which a threshold normally exists (*e.g.*, radiation-induced opacities within the lens of the eye).

DOE means the United States Department of Energy.

DOE activity means an activity taken for or by DOE in a DOE operation or facility that has the potential to result in the occupational exposure of an individual to radiation or radioactive material. The activity may be, but is not limited to, design, construction, operation, or decommissioning. To the extent appropriate, the activity may involve a single DOE facility or operation or a combination of facilities and operations, possibly including an entire site or multiple DOE sites.

Entrance or access point means any location through which an individual could gain access to areas controlled for the purpose of radiation protection. This includes entry or exit portals of sufficient size to permit human entry, irrespective of their intended use.

General employee means an individual who is either a DOE or DOE contractor employee; an employee of a subcontractor to a DOE contractor; or an individual who performs work for or in conjunction with DOE or utilizes DOE facilities.

High contamination area means any area, accessible to individuals, where removable surface contamination levels exceed or are likely to exceed 100 times the removable surface contamination values specified in appendix D of this part.

High radiation area means any area, accessible to individuals, in which radiation levels could result in an individual receiving an equivalent dose to the whole body in excess of 0.1 rems (0.001 Sv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.

Individual means any human being.

Member of the public means an individual who is not a general employee. An individual is not a "member of the public" during any period in which the

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individual receives an occupational dose.

Minor means an individual less than 18 years of age.

Monitoring means the measurement of radiation levels, airborne radioactivity concentrations, radioactive contamination levels, quantities of radioactive material, or individual doses and the use of the results of these measurements to evaluate radiological hazards or potential and actual doses resulting from exposures to ionizing radiation.

Occupational dose means an individual's ionizing radiation dose (external and internal) as a result of that individual's work assignment. Occupational dose does not include doses received as a medical patient or doses resulting from background radiation or participation as a subject in medical research programs.

Person means any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency, any State or political subdivision of, or any political entity within a State, any foreign government or nation or other entity, and any legal successor, representative, agent or agency of the foregoing; provided that person does not include DOE or the United States Nuclear Regulatory Commission.

Radiation means ionizing radiation: alpha particles, beta particles, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used in this part, does not include non-ionizing radiation, such as radio waves or microwaves, or visible, infrared, or ultraviolet light.

Radiation area means any area, accessible to individuals, in which radiation levels could result in an individual receiving an equivalent dose to the whole body in excess of 0.005 rem (0.05 mSv) in 1 hour at 30 centimeters from the source or from any surface that the radiation penetrates.

Radioactive material area means any area within a controlled area, accessible to individuals, in which items or containers of radioactive material exist and the total activity of radioactive material exceeds the applicable

values provided in appendix E of this part.

Radioactive material transportation means the movement of radioactive material by aircraft, rail, vessel, or highway vehicle. Radioactive material transportation does not include preparation of material or packagings for transportation, storage of material awaiting transportation, or application of markings and labels required for transportation.

Radiological area means any area within a controlled area defined in this section as a "radiation area," "high radiation area," "very high radiation area," "contamination area," "high contamination area," or "airborne radioactivity area."

Radiological worker means a general employee whose job assignment involves operation of radiation producing devices or working with radioactive materials, or who is likely to be routinely occupationally exposed above 0.1 rem (0.001 Sv) per year total effective dose.

Real property means land and anything permanently affixed to the land such as buildings, fences and those things attached to the buildings, such as light fixtures, plumbing and heating fixtures.

Real-time air monitoring means measurement of the concentrations or quantities of airborne radioactive materials on a continuous basis.

Respiratory protective device means an apparatus, such as a respirator, worn by an individual for the purpose of reducing the individual's intake of airborne radioactive materials.

Sealed radioactive source means a radioactive source manufactured, obtained, or retained for the purpose of utilizing the emitted radiation. The sealed radioactive source consists of a known or estimated quantity of radioactive material contained within a sealed capsule, sealed between layer(s) of non-radioactive material, or firmly fixed to a non-radioactive surface by electroplating or other means intended to prevent leakage or escape of the radioactive material. Sealed radioactive sources do not include reactor fuel elements, nuclear explosive devices, and radioisotope thermoelectric generators.

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Source leak test means a test to determine if a sealed radioactive source is leaking radioactive material.

Special tritium compound (STC) means any compound, except for H₂O, that contains tritium, either intentionally (e.g., by synthesis) or inadvertently (e.g., by contamination mechanisms).

Stochastic effects means malignant and hereditary diseases for which the probability of an effect occurring, rather than its severity, is regarded as a function of dose without a threshold, for radiation protection purposes.

Very high radiation area means any area, accessible to individuals, in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in one hour at 1 meter from a radiation source or from any surface that the radiation penetrates.

Week means a period of seven consecutive days.

Year means the period of time beginning on or near January 1 and ending on or near December 31 of that same year used to determine compliance with the provisions of this part. The starting and ending date of the year used to determine compliance may be changed, provided that the change is made at the beginning of the year and that no day is omitted or duplicated in consecutive years.

(b) As used in this part to describe various aspects of radiation dose:

Absorbed dose (D) means the average energy imparted by ionizing radiation to the matter in a volume element per unit mass of irradiated material. The absorbed dose is expressed in units of rad (or gray) (1 rad = 0.01 gray).

Committed effective dose (E₅₀) means the sum of the committed equivalent doses to various tissues or organs in the body (H_{T,50}), each multiplied by the appropriate tissue weighting factor (w_T)—that is, $E_{50} = \sum w_T H_{T,50} + w_{\text{Remainder}} H_{\text{Remainder},50}$. Where $w_{\text{Remainder}}$ is the tissue weighting factor assigned to the remainder organs and tissues and $H_{\text{Remainder},50}$ is the committed equivalent dose to the remainder organs and tissues. Committed effective dose is expressed in units of rem (or Sv).

Committed equivalent dose (H_{T,50}) means the equivalent dose calculated to be received by a tissue or organ over

a 50-year period after the intake of a radionuclide into the body. It does not include contributions from radiation sources external to the body. Committed equivalent dose is expressed in units of rem (or Sv).

Cumulative total effective dose means the sum of all total effective dose values recorded for an individual plus, for occupational exposures received before the implementation date of this amendment, the cumulative total effective dose equivalent (as defined in the November 4, 1998 amendment to this rule) values recorded for an individual, where available, for each year occupational dose was received, beginning January 1, 1989.

Dose is a general term for absorbed dose, equivalent dose, effective dose, committed equivalent dose, committed effective dose, or total effective dose as defined in this part.

Effective dose (E) means the summation of the products of the equivalent dose received by specified tissues or organs of the body (H_T) and the appropriate tissue weighting factor (w_T)—that is, $E = \sum w_T H_T$. It includes the dose from radiation sources internal and/or external to the body. For purposes of compliance with this part, equivalent dose to the whole body may be used as effective dose for external exposures. The effective dose is expressed in units of rem (or Sv).

Equivalent dose (H_T) means the product of average absorbed dose (D_{T,R}) in rad (or gray) in a tissue or organ (T) and a radiation (R) weighting factor (w_R). For external dose, the equivalent dose to the whole body is assessed at a depth of 1 cm in tissue; the equivalent dose to the lens of the eye is assessed at a depth of 0.3 cm in tissue, and the equivalent dose to the extremity and skin is assessed at a depth of 0.007 cm in tissue. Equivalent dose is expressed in units of rem (or Sv).

External dose or exposure means that portion of the equivalent dose received from radiation sources outside the body (i.e., “external sources”).

Extremity means hands and arms below the elbow or feet and legs below the knee.

Internal dose or exposure means that portion of the equivalent dose received

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from radioactive material taken into the body (*i.e.*, “internal sources”).

Radiation weighting factor (w_R) means the modifying factor used to calculate the equivalent dose from the average tissue or organ absorbed dose; the ab-

sorbed dose (expressed in rad or gray) is multiplied by the appropriate radiation weighting factor. The radiation weighting factors to be used for determining equivalent dose in rem are as follows:

RADIATION WEIGHTING FACTORS¹, w_R

Type and energy range	Radiation weighting factor
Photons, electrons and muons, all energies	1
Neutrons, energy < 10 keV ^{2,3}	5
Neutrons, energy 10 keV to 100 keV ^{2,3}	10
Neutrons, energy > 100 keV to 2 MeV ^{2,3}	20
Neutrons, energy > 2 MeV to 20 MeV ^{2,3}	10
Neutrons, energy > 20 MeV ^{2,3}	5
Protons, other than recoil protons, energy > 2 MeV	5
Alpha particles, fission fragments, heavy nuclei	20

¹All values relate to the radiation incident on the body or, for internal sources, emitted from the source.

²When spectral data are insufficient to identify the energy of the neutrons, a radiation weighting factor of 20 shall be used.

³When spectral data are sufficient to identify the energy of the neutrons, the following equation may be used to determine a neutron radiation weighting factor value:

$$w_R = 5 + 17 \exp \left[\frac{-(\ln(2E_n))^2}{6} \right] \text{ Where } E_n \text{ is the neutron energy in MeV.}$$

Tissue weighting factor (w_T) means the fraction of the overall health risk, resulting from uniform, whole body irradiation, attributable to specific tissue (T). The equivalent dose to tissue, (H_T), is multiplied by the appropriate tissue weighting factor to obtain the effective dose (E) contribution from that tissue. The tissue weighting factors are as follows:

TISSUE WEIGHTING FACTORS FOR VARIOUS ORGANS AND TISSUES

Organs or tissues, T	Tissue weighting factor, w_T
Gonads	0.20
Red bone marrow	0.12
Colon	0.12
Lungs	0.12
Stomach	0.12
Bladder	0.05
Breast	0.05
Liver	0.05
Esophagus	0.05
Thyroid	0.05
Skin	0.01
Bone surfaces	0.01
Remainder ¹	0.05

TISSUE WEIGHTING FACTORS FOR VARIOUS ORGANS AND TISSUES—Continued

Organs or tissues, T	Tissue weighting factor, w_T
Whole body ²	1.00

¹“Remainder” means the following additional tissues and organs and their masses, in grams, following parenthetically: adrenals (14), brain (1400), extrathoracic airways (15), small intestine (640), kidneys (310), muscle (28,000), pancreas (100), spleen (180), thymus (20), and uterus (80). The equivalent dose to the remainder tissues ($H_{\text{remainder}}$), is normally calculated as the mass-weighted mean dose to the preceding ten organs and tissues. In those cases in which the most highly irradiated remainder tissue or organ receives the highest equivalent dose of all the organs, a weighting factor of 0.025 (half of remainder) is applied to that tissue or organ and 0.025 (half of remainder) to the mass-weighted equivalent dose in the rest of the remainder tissues and organs to give the remainder equivalent dose.

²For the case of uniform external irradiation of the whole body, a tissue weighting factor (w_T) equal to 1 may be used in determination of the effective dose.

Total effective dose (TED) means the sum of the effective dose (for external exposures) and the committed effective dose.

Whole body means, for the purposes of external exposure, head, trunk (including male gonads), arms above and including the elbow, or legs above and including the knee.

(c) Terms defined in the Atomic Energy Act of 1954 or in 10 CFR part 820 and not defined in this part are used

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consistent with their meanings given in the Atomic Energy Act of 1954 or in 10 CFR part 820.

[72 FR 31922, June 8, 2007, as amended at 74 FR 18116, Apr. 21, 2009]

§ 835.3 General rule.

(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.

(b) With respect to a particular DOE activity, contractor management shall be responsible for compliance with the requirements of this part.

(c) Where there is no contractor for a DOE activity, DOE shall ensure implementation of and compliance with the requirements of this part.

(d) Nothing in this part shall be construed as limiting actions that may be necessary to protect health and safety.

(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.

[58 FR 65485, Dec. 14, 1993, as amended at 63 FR 59682, Nov. 4, 1998]

§ 835.4 Radiological units.

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.

[72 FR 31925, June 8, 2007]

Subpart B—Management and Administrative Requirements

§ 835.101 Radiation protection programs.

(a) A DOE activity shall be conducted in compliance with a documented radiation protection program (RPP) as approved by the DOE.

(b) The DOE may direct or make modifications to a RPP.

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(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.

(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.

(e) The content of the RPP shall address, but shall not necessarily be limited to, each requirement in this part.

(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 the amendments to this part published on June 8, 2007 shall be achieved no later than July 9, 2010.

(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.

(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.

(i) An initial RPP or an update shall be considered approved 180 days after its submission unless rejected by DOE at an earlier date.

[58 FR 65485, Dec. 14, 1993, as amended at 63 FR 59682, Nov. 4, 1998; 72 FR 31925, June 8, 2007]

§ 835.102 Internal audits.

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