SRP	LA	ISAS	Comment
9.0 RADIATION SAFETY			
9.1 RADIATION SAFETY DESIGN FEATURES			
9.1.4 ACCEPTANCE CRITERIA			
9.1.4.1 ALARA Design Considerations			
9.1.4.1.3 Regulatory Acceptance Criteria			
The requirements related to ALARA design considerations are specified in Section 9.1.4.1.1. The applicant's ALARA design considerations should meet the regulatory requirements if the following regulatory acceptance criteria, or information describing acceptable alternatives, are met:			
A. The applicant defines organizational functions that have the responsibility for performing radiological design and design reviews.	9.1.1.4		
B. The applicant's design and design activities, with respect to radiation protection, incorporate provisions that provide reasonable assurance that the design will:			
i. Reduce the need for time spent in radiation areas;	9.1.1.5 9.1.4.5		
ii. Improve the accessibility to components requiring periodic maintenance or inservice inspection;	9.1.1.2 9.1.1.5 9.1.2.2 9.1.4 9.1.4.5		
iii. Reduce the distribution and retention of radioactive materials throughout plant systems;	9.1.1.5 9.1.2.3		
iv. Control (reduce) contamination, facilitate decommissioning, and minimize secondary radioactive waste production in accordance with 10 CFR 20.1406;	9.1.2.3.3 9.1.4		
v. Instruct designers and engineers in ALARA design objectives;	9.1.1		
vi. Incorporate experience from operating	9.1.1.4		

SRP	LA	ISAS	Comment
plants and past designs; and			
9.1.4.4 Ventilation Systems and Glovebox Design			
9.1.4.4.3 Regulatory Acceptance Criteria			
A ventilation system is necessary to provide confinement integrity and to process off-gas before being exhausted to the environment. The review performed in this SRP section concerns those functions of the ventilation and air cleaning system that pertain to occupational radiation protection (specifically, controlling internal dose through limiting airborne radioactivity).		4.2.13 4.3	
9.2 RADIATION PROTECTION PROGRAM			
9.2.4.1 ALARA (As Low As Reasonably Achievable)			
9.2.4.1.3 Regulatory Acceptance Criteria			
The requirements related to ALARA in the applicant's radiation protection program are specified in Section 9.2.4.1.1. The applicant's program should meet the regulatory requirements if the following acceptance criteria are met:			
A. Management's ALARA Policies and Commitments			
The applicant provides a clear management commitment to policies and provisions for maintaining individual and collective doses at levels that are ALARA. The applicant's approach addresses the regulatory guidance of RG 8.10, and provides reasonable assurance that:	9.2.1.1		
i. The management commitment will be communicated to all plant personnel through policy statements, instructions to personnel, and similar documents, as well as direct communication, training, and inspection of the workplace.	9.2.1.1		

SRP	LA	ISAS	Comment
iii. Adequate equipment and supplies are available to the radiation protection staff to perform all personnel dosimetry, environmental monitoring, and bioassay functions.	9.2.11	4.12 4.12.6	
iv. The applicant establishes a system for receiving and reviewing radiation protection related suggestions from employees, and workers are made knowledgeable of the process [RG 8.10 C.2(b)1].			Not addressed in the LA or ISA Summary.

CAR Chapter 9 Crosswalk to the LA and ISA Summary *(Example)*

CAR	LA	ISAS	Comment
CAR 9.1.1 Para. 2 - Specific ALARA considerations in the MFFF design include the following: Removal of radioactive sources before most maintenance operations	9.1.1.2		
CAR 9.1.1 Para. 2 - Specific ALARA considerations in the MFFF design include the following: Use of area radiation monitoring with local and remote readouts and alarms to inform personnel of changing conditions.	9.1.1.2		
CAR 9.1.1 Para. 2 - Specific ALARA considerations in the MFFF design include the following: Use of automated and remotely operated equipment to minimize personnel exposure	9.1.1.2		
CAR 9.1.1.2 Para. 1 - Dose assessments are performed using Regulatory Guide 8.19, Occupational Radiation Dose Assessment in Light-Water Reactor Power Plants, Design Stage Man-Rem Estimates	9.1.4.6 9.1.1.3	4.12.7.2	
CAR 9.1.1.2 Para. 1 - Dose assessments are performed using Regulatory Guide 8.34, Monitoring Criteria and Methods to Calculate Occupational Radiation Doses.	9.1.4.6 9.1.1.3		
CAR 9.1.1.3 Para. 1 - An appropriately qualified organization will be responsible for reviewing facility or process modifications for the express purpose of maintaining exposures ALARA.	9.1.1.4		

FSER	LA	ISAS	Comment
Section 1.1.1.1.1, Page 1-1,Para 1 The restricted area and controlled area are shown in Figure 1.1-2 of the CAR. Pursuant to Section 70.61(f) of 10 CFR, DCS will retain authority to exclude or remove personnel and property from the controlled area.	1.1.3		
Section 1.1.1.1.1, Page 1-2, Para 1 the duties of individuals inside the proposed MFFF controlled area will involve potential exposures to radiation or to radioactive material, and, therefore, these individuals could receive an occupational dose. The staff concludes, therefore, that the applicant may consider these individuals to be workers, for the purposes of demonstrating that risks of postulated accidents and natural phenomema hazards are acceptably low.	1.1.3		Clarification - The referenced section defines restricted area. Section 1.1.3 states we have a restricted area but does not define it.
Section 1.1.1.1.1, Page 1-2, Para 2 ...the applicant commited to meet the performance requirements for “individuals outside the controlled area,” as that phrase is used in 10 CFR 70.61.	1.1.3		
Section 1.1.1.1.1, Page 1.1-2, para 3 … “facility workers,” are workers in the restricted area inside a room of the MFFF near a potential accident release point. “Site workers” are workers considered to be outside the MFFF located 100 m (328 ft) from the ventilation exhaust stack. IOC refers to individuals at or beyond the proposed MFFF controlled area boundary. A fourth receptor protected under the provisions		5.1.2.3	

FSER	LA	ISAS	Comment
of 10 CFR 70.61 is the environment, which is understood by both the applicant and NRC staff to be all areas outside the restricted area.			
Section 1.2.1.3, Page 1-7, para 1 The applicant plans to request an NRC materials license pursuant to 10 CFR Parts 30, 40 and 70... The term of the license to be requested to possess and use these materials is 20 years.	Table 1.2-1 1.2.2		
Section 1.2.1.3, Page 1-8, para 3 The applicant also identified special exemptions to be requested related to decommissioning funding and financial protection under the Price-Anderson Act. The applicant will request these exemptions as part of the license application.	1.2.4.1		
Section 1.3.1.4, page 1-14, para 12 The planned construction of the facility will not penetrate into the upper groundwater table that exists 50 feet (15 m) below grade level.	ISAS 2.4.5.1.3		The 50 foot depth could not be verified.
Section 1.3.1.5.5, page 1-22, para 7 …the applicant has agreed to use both the horizontal and vertical spectra in RG 1.60 (NRC, 1973) anchored at 0.20g PGA.		3.1.6.4.1.3 5.3.8.2.1	
Section 2.1.3, page 2-2, para 1 The applicant intends to request an exemption to the regulatory requirments of 10 CFR 140.13a in any possession and use license application it may later submit, and would use the DOE indemnification to meet its public liability insurance requirements.	LA 1.2.4.2		

SRP	LA	ISAS	Comment
10.0 ENVIRONMENTAL PROTECTION			
10.4.3 Regulatory Acceptance Criteria			
A. Radiation Safety			
In accordance with 10 CFR 20.1101, each licensee must implement a radiation protection program, which is discussed in detail in Chapter 9.0 of this SRP. The environmental review of the radiation protection program focuses on the applicant's methods to maintain public doses ALARA in accordance with 10 CFR 20.1101. NRC guidance on compliance with these regulations can be found in Regulatory Guide 8.37, "ALARA Levels for Effluents from Materials Facilities," July 1993. Specifically, 10 CFR 20.1101(d) requires the applicant to establish a constraint on air emissions of radioactive material to the environment, excluding Radon-222 and its decay products, such that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent (TEDE) in excess of 0.1 mSv (10 mrem) per year from these emissions. The applicant must have procedures to report to the NRC in accordance with 10 CFR 20.2203 when this dose constraint is exceeded and to take prompt appropriate corrective action to ensure against recurrence. NRC guidance on compliance with this regulation can be found in Regulatory Guide 4.20, "Constraint on Releases of Airborne Radioactive Materials to the Environment for Licensees Other Than Power Reactors,"	10.1 9.2 10.1 10.1.1 10.1.1 10.3.6		

SRP	LA	ISAS	Comment
December 1996. The environmental review of the radiation protection program also focuses on the applicant's waste minimization practices. Applicants for new licenses are required to comply with 10 CFR 20.1406, which states that the applicant must describe how facility design procedures for operation will minimize, to the extent practical, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practical, the generation of radioactive waste. Applicants requesting amendment or renewal of existing licenses must minimize and control waste generation during operations as part of the radiation protection program in accordance with 10 CFR 20.1101 [62 FR 39082]. Guidance for waste minimization programs can be found in NRC Information Notice 94–23, "Guidance to Hazardous, Radioactive and Mixed Waste Generators on the Elements of a Waste Minimization Program," March 25, 1994.	10.1.4		
The proposed radiation protection program is acceptable if, in addition to the acceptance criteria outlined in Section 9.2, it satisfies the following criteria:			
i. Radiological (ALARA) Goals for Effluent Control			
ALARA goals for effluent control are set at a modest fraction (10% to 20%) of the values in Appendix B, Table 2, Columns 1 and 2 and Table 3 and the external exposure limit in 10 CFR 20.1302(b)(2)(ii), or the dose limit for members of the public, if the applicant proposes to demonstrate compliance with 10 CFR 20.1301 through a calculation of the TEDE to the individual likely to receive the	10.1.1		

SRP	LA	ISAS	Comment
highest dose. An applicant's constraint approach is acceptable if it is consistent with guidance found in Regulatory Guide 4.20 and the applicant's description of the constraint approach provides sufficient detail to demonstrate specific application of the guidance to proposed routine operations and nonroutine operations, including anticipated events.			
i. Effluent Monitoring			
The reviewer should find that the applicant's effluent monitoring is acceptable if it meets the following criteria:			
b. If the licensee proposes to demonstrate compliance with 10 CFR 20.1301 through a calculation of the TEDE to the individual likely to receive the highest dose in accordance with 10 CFR 20.1302(b)(1), calculation of the TEDE by pathways analyses uses appropriate models and codes and assumptions that accurately represent the facility, the site, and the surrounding area; assumptions are reasonable; input data is accurate; all applicable pathways are considered; and the results are interpreted correctly. NCRP Report No. 123, "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground," January 1996, provides acceptable methods for calculating the dose from radioactive effluents. Computer codes are acceptable tools for pathways analysis if the applicant is able to show that the code has undergone validation and verification to demonstrate the validity of estimates developed using the code for established input sets. Dose conversion factors used in the pathways analyses are acceptable if they are based on the methodology described in International Council on Radiation Protection 30, "Limits for Intakes of	10.1.1 10.3.1	5.1.2.3.2.2	

SRP	LA	ISAS	Comment
Radionuclides by Workers," as reflected in Federal Guidance Report 11. Such methods are acceptable for determining the dose to the maximally exposed individual during normal facility operations and anticipated events.			

CODES AND STANDARDS CROSSWALK						
REF. NO.	CAR SECTION	CODES AND STANDARDS IDENTIFIED IN DOCUMENTS				COMMENTS
		CODE/STANDARD	FSER	LA	ISAS	
1	9.1.2.3.3	NUREG/CR-0446, Determining Effectiveness of ALARA Design and Operational Features - 1979		9.1.4.7	4.12.7.2	No edition specified
2	9.1.5.3	ANSI/ANS-6.4.2-1985, Specification for Radiation Shielding Materials R1997		9.1.4.3 9.1.2.2	4.12.7.2 5.3.10.2	
3	9.2.1	Regulatory Guide 8.10, Operating Philosophy for Maintaining Occupational Radiation Exposure				
4	9.1.1.2	Regulatory Guide 8.19, Occupational Radiation Dose Assessment in Light-Water Reactor Power Plants, Design Stage Man-Rem Estimates		9.1.4.6 9.1.1.3	4.12.7.2	1996 specified
5	9.2.2.9	Regulatory Guide 8.34, Monitoring Criteria and Methods to Calculate Occupational Radiation Doses		9.1.1.3 9.1.4.6		
6	9.2.2.9	Regulatory Guide 8.36, Radiation Dose to the Embryo/Fetus				
7	9.2.2.9	Regulatory Guide 8.7, Instructions for Recording and Reporting Occupational Radiation Exposure Data				
8	9.2.2.10	ANSI-Z88.2-1992, Practices for Respiratory Protection,	8.1.2.6.1	11.8.1.12.2 11.8.4.2	4.8.4.2 4.8.1.12.2	

CODES AND STANDARDS CROSSWALK						
REF. NO.	CAR SECTION	CODES AND STANDARDS IDENTIFIED IN DOCUMENTS				COMMENTS
		CODE/STANDARD	FSER	LA	ISAS	
9	9.2.2.10	ANSI-Z88.6-1984, Physical Qualifications for Respirator Use				
10	9.2.2.10	NUREG-0041, Manual of Respiratory Protection Against Airborne Radioactive Materials.				
11	9.2.2.10	ANSI 323, Radiation Protection Instrumentation Test and Calibration, 1978	9.1.2.8	9.1.11.2		No edition specified
12	9.3	Regulatory Guide 8.25 (1992), Air Sampling in the Workplace			4.12.7.2	
13	9.3	Regulatory Guide 8.8 (1978), Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable		9.1.4.2	4.12.7.2	No edition specified
14	9.3	ANSI/ANS-6.1-1-1977, Neutron and Gamma-Ray Flux-to-Dose Rate Factors			4.12.7.2	1977 and 1991 editions specified
15	9.3	ANSI/ANS-6.4-1977, Guidelines on the Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants			4.12.7.2	
16	9.3	ANSI-N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities [Reaffirmed 1993]				

CODES AND STANDARDS CROSSWALK						
REF. NO.	CAR SECTION	CODES AND STANDARDS IDENTIFIED IN DOCUMENTS				COMMENTS
		CODE/STANDARD	FSER	LA	ISAS	
17	9.3	DOE-STD-1128-98, Guide of Good Practices for Occupational Radiological Protection in Plutonium Facilities			4.12.7.2	
18	5.4.4.12	Federal Guidance Report No. 11, "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion and Ingestion," issued 1988 (EPA, 1988).	9.1.1.3	5.2.2.3.2.2	5.1.2.3.2.2	
19	5.4.4 5.4.4.1 5.4.4.4 8.4.1 8.3.3	NUREG/CR-6410, "Nuclear Fuel Cycle Facility Accident Analysis Handbook," issued 1998 (NRC, 1998).	9.1.1.4	5.2.2.3.1 5.2.2.3.2.1 5.2.2.4.1 5.2.2.3.5	5.1.2.3.2 5.1.2.3.2.1 5.1.2.3.5 5.1.2.4.1	
20	5.3.3.4 6.0 6.4	RG 3.71, "Nuclear Criticality Safety Standards for Fuels and material Facilities," issued 1972	9.1.1.4.2	6.0 6.5		No edition specified.
21	5.5.2.5.4 5.5.3.4	RG 3.35, "Assumptions Used for Evaluating the Potential Radiological Consequences of Accidental Nuclear Criticality in a Plutonium Processing and Fuel Fabrication Plant," issued 1972 (NRC,1972c; NRC,1972b	9.1.1.4.2			Reg Guide 3.35, while not referenced in the LA, was use in subordinate documents (consequence calculations and criticality consequence calculations), which are available for review in the MOX Project offices.

CODES AND STANDARDS CROSSWALK						
REF. NO.	CAR SECTION	CODES AND STANDARDS IDENTIFIED IN DOCUMENTS				COMMENTS
		CODE/STANDARD	FSER	LA	ISAS	
22	5.4.1.1.3 Table 5.5-7	RG 1.78, "Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release," issued December 2001	9.1.1.4.3		Table 5.3.1-9	
23		RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," issued June 2003 (NRC, 2001b; NRC, 2003b)	9.1.1.4.3			
24	5.4.4.1.2	Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors, 1972	9.1.1.4.3	5.2.2.3.2.2	5.1.2.3.2.2	No edition specified
25	5.4.4.1.2 5.4.4.1.3.2 5.4.4.2 8.3.3 8.3.3.1	ARCON96 Code System to Calculate Atmospheric Relative Concentrations in Building Wakes." CCC-664 Radiation Safety Information Computational Center. Washington, DC, 1999	9.1.1.4.3	5.2.2.3.2.2 5.2.2.3.2.3 5.2.2.3.4 5.2.2.4.1 8.3.1.4	5.1.2.3.2.2 5.1.2.3.2.3 5.1.2.4.1 5.1.2.3.4	
47		American National Standard HPS N13.30-1996 Performance Criteria for Radiobioassay		9.2.8		

CODES AND STANDARDS CROSSWALK						
REF. NO.	CAR SECTION	CODES AND STANDARDS IDENTIFIED IN DOCUMENTS				COMMENTS
		CODE/STANDARD	FSER	LA	ISAS	
49		ANSI/ANS-6.1-2-1999, Neutron and Gamma-Ray Cross Sections for Nuclear Radiation Protection Calculations for Nuclear Power Plants			4.12.7.2	
50		PNL-6612, Health Physics Manual of Good Practices for the Prompt Detection of Airborne Plutonium in the Workplace			4.12.7.2	