



Nuclear Regulatory Commission
Radiation Protection,
Emergency Planning,
and Environmental
Kickoff Meeting

18 April 2007



Agenda

- Radiation Protection
- Emergency Planning
- Environmental



Radiation Protection

Radiation Protection Agenda

- Reg Guides and Industrial Standards
- Crosswalk examples
 - CAR to License Application (LA)/Integrated Safety Analysis Summary (ISAS)
 - FSER to LA/ISAS
 - NUREG-1718 to LA/ISAS

Reg Guides and Industrial Standards

Discussion of commitments to Reg. Guides and Industry Standards

- Reg Guides and other guidance documents used in the MFFF design
- Also will be used in the development of the operational programs & procedures
- Useful in creating compliant programs acceptable to the NRC. Operational programs will include the fundamental elements and expectations described in the guides.
- Refer to Codes and Standards Handout

Crosswalk Examples

- CAR Chapter 9 to LA/ISAS example handout
- FSER Chapter 9 to LA/ISAS example handout
- NUREG-1718 Chapter 9 to LA/ISAS example

Emergency Planning

Emergency Planning Agenda

- Stand alone evaluation and supporting documentation
- Commitments to have emergency procedures as part of Radiation Protection (RP) procedures
- Commitment to be part of the SRS Emergency Plan (EP)
- Inputs and assumptions used to meet 1 Rem threshold
- Management measures to assure EP Evaluation remains valid

Stand alone Evaluation and Supporting Documentation

- Assumptions
- Results
- Supporting Documentation
 - Level of detail needed for stand alone submittal

Commitments to have Emergency Procedures as part of RP Procedures

- Emergency procedures for the MFFF are separate from RP procedures. An Emergency Response Manual will contain appropriate emergency response procedures.
- Not included as a licensing commitment, but as a best management practice, a MFFF emergency plan will be an annex to the SRS Emergency Plan

Inputs and Assumptions used to meet 1 Rem Limit

- Consistent with NUREG/CR-6410
- $1E19$ total fissions
 - $1E18$ fissions initial pulse over 0.5 seconds
 - 47 subsequent bursts of $1.9E17$ fissions of 5 second duration every 10 minutes lasting 8 hours.
- DCF's from Federal Guidance Report No. 11
- ARF = 1.0 for noble gases and iodines, $2E-4$ for non-volatile fission products
- LPF = 1.0 for noble gases, 0.25 for iodines, $1E-4$ for particulates.
- Inhalation and submersion dose dominate results to the IOC.
- Meteorological Dispersion from ARCON96 code, release from facility stack, ground level release assumed, IOC at 160 meters.
- Direct dose, cloud shine and organ doses are assumed to be negligible.

Results

Nuclide	Release Quantity [1]			LPF [2]	ST _{crit} (Ci)	Inhalation DCF (Sv/Bq)	Submersion DCF (Sv-m ³ /Bq-se)	Site Worker	Site Worker	Site Worker	IOC	IOC	% of total	IOC
	0-0.5 hr. (Ci)	0.5-8.0 hr (Ci)	MAR _{crit} (Ci)					Inhalation Dose (Rem)	Submersion Dose (Rem)	TEDE (Rem)	Inhalation Dose (Rem)	Submersion Dose (Rem)		TEDE (Rem)
Kr-83m	1.50E+01	9.50E+01	1.10E+02	1.0	1.10E+02	---	1.50E-18	---	3.72E-07	3.72E-07	---	1.53E-07	0.0%	1.53E-07
Kr-85m	9.90E+00	6.10E+01	7.09E+01	1.0	7.09E+01	---	7.48E-15	---	1.19E-03	1.19E-03	---	4.91E-04	0.1%	4.91E-04
Kr-85	1.20E-04	7.20E-04	8.40E-04	1.0	8.40E-04	---	1.19E-16	---	2.25E-10	2.25E-10	---	9.25E-11	0.0%	9.25E-11
Kr-87	6.00E+01	3.70E+02	4.30E+02	1.0	4.30E+02	---	4.12E-14	---	3.99E-02	3.99E-02	---	1.64E-02	1.9%	1.64E-02
Kr-88	3.20E+01	2.00E+02	2.32E+02	1.0	2.32E+02	---	1.02E-13	---	5.33E-02	5.33E-02	---	2.19E-02	2.5%	2.19E-02
Kr-89*	1.80E+03	1.10E+04	1.28E+04	1.0	1.28E+04	---	---	---	---	---	---	---	---	---
Xe-131m	1.40E-02	8.60E-02	1.00E-01	1.0	1.00E-01	---	3.89E-16	---	8.77E-08	8.77E-08	---	3.60E-08	0.0%	3.60E-08
Xe-133m	3.10E-01	1.90E+00	2.21E+00	1.0	2.21E+00	---	1.37E-15	---	6.82E-06	6.82E-06	---	2.80E-06	0.0%	2.80E-06
Xe-133	3.80E+00	2.30E+01	2.68E+01	1.0	2.68E+01	---	1.56E-15	---	9.42E-05	9.42E-05	---	3.87E-05	0.0%	3.87E-05
Xe-135m	4.60E+02	2.80E+03	3.26E+03	1.0	3.26E+03	---	2.04E-15	---	1.50E-02	1.50E-02	---	6.15E-03	0.7%	6.15E-03
Xe-135	5.70E+01	3.50E+02	4.07E+02	1.0	4.07E+02	---	1.19E-14	---	1.09E-02	1.09E-02	---	4.48E-03	0.5%	4.48E-03
Xe-137	6.90E+03	4.20E+04	4.89E+04	1.0	4.89E+04	---	0.00E+00	---	0.00E+00	0.00E+00	---	0.00E+00	0.0%	0.00E+00
Xe-138	1.50E+03	9.50E+03	1.10E+04	1.0	1.10E+04	---	5.77E-14	---	1.43E+00	1.43E+00	---	5.87E-01	67.6%	5.87E-01
I-131	1.50E+00	9.50E+00	1.10E+01	0.25	2.75E+00	8.89E-09	1.82E-14	1.91E-02	1.13E-04	1.92E-02	7.85E-03	4.63E-05	0.9%	7.89E-03
I-132	1.70E+02	1.00E+03	1.17E+03	0.25	2.93E+02	1.03E-10	1.12E-13	2.36E-02	7.38E-02	9.74E-02	9.67E-03	3.03E-02	4.6%	4.00E-02
I-133	2.20E+01	1.40E+02	1.62E+02	0.25	4.05E+01	1.58E-09	2.94E-14	5.00E-02	2.68E-03	5.27E-02	2.05E-02	1.10E-03	2.5%	2.16E-02
I-134	6.00E+02	3.70E+03	4.30E+03	0.25	1.08E+03	3.55E-11	1.30E-13	2.98E-02	3.15E-01	3.45E-01	1.22E-02	1.29E-01	16.3%	1.42E-01
I-135	6.30E+01	3.90E+02	4.53E+02	0.25	1.13E+02	3.32E-10	7.98E-14	2.94E-02	2.04E-02	4.98E-02	1.21E-02	8.36E-03	2.4%	2.04E-02
* decay time assumed to make Kr-89 contribution negligible										2.11E+00				8.68E-01

Criticality Accident Consequences Conservatism

- Considerable conservatism in the current analysis
 - Total fissions assumed are orders of magnitude above what would be expected.
 - Realistic X/Q would be an order of magnitude lower.
 - Event is beyond design basis.
 - All applicable material is available for release
 - Based on tank with max inventory of Pu

Management Measures to Assure EP Evaluation Remains Valid

- Potential impacts on the EP Evaluation are evaluated using PP8-6, “Licensing Basis Configuration Management”



Environmental

Environmental Agenda

- Changes to Facility Design that may Impact the FEIS
- Supporting Information for Environmental Surveillance air sample locations
- Commitment for Sampling Plans for Environmental Monitoring and Surveillances
- Trend Analysis, Incorporation to ALARA committee Review
- NUREG-1718 Chapter 10 crosswalk example

Changes to Facility Design that may Impact the FEIS

- Configuration Management for the FEIS will be controlled under Procedure PP8-6, “Licensing Basis Configuration Management”.

Supporting Information for Environmental Surveillance Air Sample Locations

- Air sampling locations were selected using the guidance of NUREG-1301. Three locations (A-01, A-02 and A-03,) are used for calculation of dose to non-MFFF site workers.
- One of the air monitoring sites (A-04) provides additional information for the calculation of any dose to SRS site workers.
- The remaining five locations (A-05, A-06, A-07, A-08, and A-09) are used to estimate dose to the public assuming a member of the public spends all their time at the SRS boundary.

Commitment for Sampling Plans for Environmental Monitoring and Surveillances

- An environmental surveillance plan has been developed for the MFFF (DCS01 ADR DS PRG H 40023)
- It will be implemented approximately two years prior to operation and continue into the operational phase

Trend Analysis, Incorporation to ALARA committee Review

- Environmental data trend analysis is a function of the RP organization staff
- Analyses will compare calculations of projected doses to empirical data. Results will be reported to the operational RP staff who is responsible to take appropriate actions.
- ALARA committee will not normally be involved in review of these evaluations.

NUREG-1718 Crosswalk

- NUREG-1718 Chapter 10 crosswalk example handout