

NRC/Energy Northwest Meeting

Alternative Source Term License Amendment

Pre-submittal Meeting

January 14, 2004



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Introduction

Engineering Management:

Mike Humphreys

Robin Feuerbacher

Licensing Management:

Doug Coleman

Project Team Personnel:

Abbas Mostala

Tim Powell

Mike Brandon

Contractor Support:

Jim Metcalf

Agenda

- AST Submittal Purpose
- Scope of Technical Specifications Changes
- SGT JCO Resolution
- Draw Down Analysis
- Meteorological Data
- Control Room Inleakage
- Dose Analyses and Differences
- AST Submittal Schedule
- Accuracy and Completeness
- Staff Review Topics

AST Submittal Purpose

Mike Brandon

- Revision to Technical Specifications and Bases to reflect AST methodology (Reg Guide 1.183)
- De-activation of Main Steam Leakage Control (MSLC) system
- Resolution of standby gas treatment/secondary containment draw down analysis
- Resolution of control room envelope in-leakage/dose
- Increase allowed Main Steam Isolation Valve (MSIV) leakage



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Scope of TS Changes

Mike Brandon

<u>TS SECTION</u>	<u>CHANGE</u>
Definitions	Revised DOSE EQUIVALENT I-131
LCO 3.1.7 SLC and Table 3.3.6.1-1	Added MODE 3
Table 3.3.6.2-1, LCO 3.6.4.1, .2 & .3	Deleted "during CORE ALTERATIONS" and added "recently"
SR 3.6.1.3.10	Revised secondary bypass leakage from ≤ 0.74 scfh to $0.04\%[\text{volume}]/\text{day}$
TS 3.6.1.8 MSLC	Deleted in its entirety

Scope of TS Changes

Mike Brandon

<u>TS SECTION</u>	<u>CHANGE</u>
SR 3.6.4.1.1	Replaced ≥ 0.25 inch vacuum wg with > 0
SR 3.6.4.1.4	Deleted this 24 month surveillance to draw down in ≤ 120 seconds
SR 3.6.4.3.3	Added new requirement to verify SGT reaches ≥ 5000 cfm in ≤ 2 minutes
TS 5.5.7 VFTP	Revised SGT System flowrate for filter testing range from "4012 to 4902" to "4500 to 5500" cfm

SGT JCO Resolution

Mike Brandon

- JCO for nonconformance with 120 second draw down time assumed in Licensing Basis
- AST License Amendment will resolve this JCO and establish the new Licensing Basis
- The information necessary for staff review and approval will be provided in the AST submittal



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Draw Down Analysis

Robin Feuerbacher

- GOTHIC 7.1 computer code
- Reactor Building (RB) Model
 - Model will use 3 nodes
 - ECCS pump room (basement elevation)
 - Refueling floor (top floor)
 - Remainder of building (RB middle section)



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Draw Down Analysis

Robin Feuerbacher

- Requirements of SRP 6.2.3
- Certified 5% / 95% meteorological data
- Sensitivity analyses being performed
- QA database for inputs/assumptions approved by Energy Northwest

Meteorological Data

Robin Feuerbacher

- Recent plant meteorological data
- Expert meteorological vendor
- Measurement units clearly identified
- Meteorological data scrubbed for completeness and accuracy by vendor and Energy Northwest
- Two separate databases maintained by vendor and Energy Northwest for final verification
- Reasonableness checks performed with vendor and NRC codes

Meteorological Data

Robin Feuerbacher

- Joint Frequency Distributions compared with PNNL on-site data at lower elevation
- Four years of recent meteorological data verified for AST (1996-99)
- Less than five years of data allowed per RG 1.194
- By RG 1.183, meteorological data collected per FSAR
 - Wider ΔT tolerance than RG 1.23, but meets RG 1.97 rev. 3
 - Wind speed classes in guidance per RG 1.111

Meteorological Data

Robin Feuerbacher

	Data recovery (%)				
	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>Avg.</u>
Lower elevation*	88.3	91.1	93.7	87.9	90.2
Upper elevation*	86.0	90.9	94.2	85.3	89.1

* Composite of delta temperature, wind speed, and wind direction available simultaneously

Control Room Inleakage

Robin Feuerbacher

Tracer Gas Test completed November 2003

Used ASTM E741 Methodology per RG 1.197

Measured Unfiltered Inleakage (under review)

Single Train results: 7 scfm

Dual Train results: 27 scfm

Unfiltered Inleakage input into AST analyses

Single Train: $40^* + 10$ (ingress/egress) cfm

Dual Train: $65^* + 10$ (ingress/egress) cfm

*Uncertainty not included per RG 1.197 if < 100 cfm

AST Dose Analyses

Robin Feuerbacher

- Revised dose analyses for LOCA, MSLB, CRDA and FHA
- STARDOSE computer code for record of analyses
- RADTRAD for checking purposes by analyst and another independent contractor
- QA database for inputs/assumptions approved by Energy Northwest

Dose Analyses – LOCA

Robin Feuerbacher

- Current Core Inventory Source Term
- Main Steam Leakage Control System not credited
- Drywell spray removal credited per SRP model
- Suppression pool pH control credited for Standby Liquid Control injection

Dose Analyses – LOCA (cont.)

Robin Feuerbacher

- Releases assumed as ground level
- Containment leakage of 0.50% / day
- Secondary containment bypass leakage of 0.04% / day
- 46 scfh MSIV leakage, evenly distributed over 4 lines (may increase pending dose sensitivity analyses and adequate margin to limits)
- Factor of two reduction in leakages at 24 hours
- Control Room Emergency Filtration auto-initiated both trains, 1 train manually secured at 30 minutes, no credit for securing one remote intake

Differences from Previous Submittal - LOCA

- Revised Control Room (CR) make-up air flows (1300 cfm dual / 800 cfm single train)
- Reduced unfiltered inleakage (75 cfm dual / 50 cfm single CREF train including CR ingress/egress)
- Revised ARCON96 and PAVAN atmospheric dispersion factors (X/Qs) for 1996-99 data
- 20-minute Reactor Building draw down, no mixing credit
- Dose Conversion Factors based FGR 11 & 12 default data in RADTRAD

Dose Analyses – MSLB

Robin Feuerbacher

- Activity for release based on Technical Specifications Dose Equivalent Iodine limits
- MSIV closure time of 6 seconds (>Tech Spec limit)
- Control Room Emergency Filtration (CREF) not credited
- Direct ground release to environment – no Turbine Building holdup
- Maximum makeup flow for normal CR ventilation (1100 cfm), no filter credit

Differences from Previous Submittal - MSLB

- Direct application of Dose Equivalent I-131
- Control Room X/Qs based on RG 1.194 “puff” release model (no steam buoyancy considered)
- Off-site X/Qs based on 1996–99 data

Dose Analyses – CRDA

Robin Feuerbacher

- Fuel damage equals 1.79% of the core
- Fuel melting occurs in 0.0138% of the core
- Release fractions of 100% noble gas and 50% iodine from melted fuel and fraction of core inventory in the fuel gap
- RG 1.183 leakage fractions from steam lines and main condenser
- No credit for CREF filters

Differences from Previous Submittal - CRDA

- Revised CR make-up air flows (same as LOCA analysis)
- Reduced CR unfiltered inleakage (same as LOCA analysis)
- Revised X/Qs for 1996-99 data (same as LOCA analysis)

Dose Analyses – FHA

Robin Feuerbacher

- Standby Gas Treatment and Secondary Containment not credited for FHA
- 24 hours fuel decay prior to accident
- Release to the environment occurs over 2 hour period
- Fuel damage is 0.528% of the core

Differences from Previous Submittal - FHA

- Reduced Elemental Iodine Decontamination factor (overall iodine DF = 200 per RG 1.183)
- Revised CR make-up air flows (same as LOCA analysis)
- Reduced CR unfiltered inleakage (same as LOCA analysis)
- Revised X/Qs for 1996-99 meteorological data (same as LOCA analysis)
- CREF filter efficiency of 95% for gaseous iodine, 99% for particulate removal (same as LOCA analysis)

AST Submittal Schedule

Robin Feuerbacher

<u>Activity</u>	<u>Date</u>
Meteorological data verified	11/20/03 - complete
Control room tracer gas tests	11/10/03 - complete
Atmospheric dispersion factors	12/31/03 - complete
Dose analyses	2/13/04
Secondary cont. draw down analyses	2/28/04
CNSRB review and approval	4/14/04
NRC submittal	4/30/04

Accuracy and Completeness

Doug Coleman

GENERIC ACTIONS

- Engineering Reorganization
- Creation of Design Authority Positions
- Implementation of the Engineering Electronic Database
- Quest for Excellence plan

Accuracy and Completeness

Mike Brandon

SPECIFIC ACTIONS

- Line-by-line review
- Rigorous certification
- Independent reviews by external experts
- Independent review by Energy Northwest QA

Staff Review Topics

Doug Coleman

- Anticipated review period
- Coordination of RAIs
- NRC review team
- Emerging issues