## NRC/Energy Northwest Meeting

### Alternative Source Term License Amendment

Pre-submittal Meeting January 14, 2004



#### 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



## Scope of TS Changes

#### Mike Brandon

	TS SECTION	CHANGE		
	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%[volume]/day		
İ	TS 3.6.1.8 MSLC	Deleted in its entirety		



## Scope of TS Changes

#### Mike Brandon

TS SECTION CHANGE				
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  Added new requirement to verify SGT reaches ≥ 5000 cfm in ≤ 2 minutes			
SR 3.6.4.3.3				
TS 5.5.7 VFTP	Revised SGT System flowrate for filter testing range from "4012 to 4902" to "4500 to 5500" cfm			



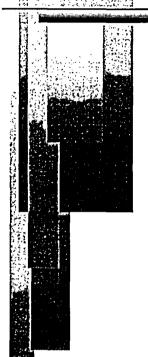
## SGT JCO Resolution

#### 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



## 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)



## 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

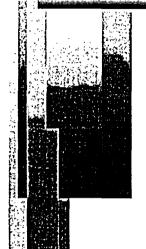


### Meteorological Data Robin Feuerbacher

- - 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  $\Delta T$  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>	1998	<u>1999</u>	Avg.	
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

