

UNITED STATES NUCLEAR REGULATORY COMMISSION WASHINGTON, D.C. 20555-0001

March 21, 1997

MEMORANDUM TO:

William F. Kane, Deputy Director Spent Fuel Project Office, NMSS

FROM:

Dennis G. Reid, Project Manager Spent Fuel Licensing Section Spent Fuel Project Office, NMSS

SUBJECT:

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(50-344)

PDR

MEETING WITH PORTLAND GENERAL ELECTRIC COMPANY REGARDING RESPONSE TO THE FIRST REQUEST FOR ADDITIONAL INFORMATION FOR THE TROJAN INDEPENDENT SPENT FUEL STORAGE INSTALLATION APPLICATION

On February 26, 1997, a management and technical exchange meeting was held between representatives of Portland General Electric Company (PGE) and its associated contractor and the U.S. Nuclear Regulatory Commission to discuss PGE's application to construct and operate an independent spent fuel storage installation (ISFSI) at its Trojan facility. Attachment 1 is an attendance list. Attachment 2 is a copy of the slides presented by PGE. The meeting was noticed on February 10, 1997.

The discussions included the application review process, but focused primarily on technical issues that resulted from PGE's response to the NRC request for additional information (RAI) issued to PGE on November 25, 1996. The technical issues discussed included: basket coatings, pad design, transfer station seismic structural analysis, basket decelerations under drop conditions for 10 CFR Part 72, criticality, fuel cladding temperature limits, the fuel debris program, and ISFSI operating procedures. Other licensing topics discussed were site construction, component fabrication and related quality assurance controls at PGE's vendors, and interfaces between 10 CFR Parts 50, 71, and 72.

The staff noted that the licensee still needs to address a number of technical issues for the staff to perform its license review. For example, the basket coating is yet to be defined, the transfer station drop analysis was incomplete, no calculations were furnished for the transfer station's foundation, and the safety significance of the transfer station's pad has not been defined.

The staff raised concerns regarding PGE's design of the concrete storage pad. Specifically, the method used to develop the design basis drop accident was unclear, and the drop weight could not be corroborated by the technical staff, even when using PGE's information. Also, the staff questioned PGE's approach of using probabilistic methods for analyzing the tornado missile impact on the transfer station.

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an office policy may be needed. In light of these discoveries, PGE's construction schedule may be impacted. The current schedule states that the concrete pad lay-out will commence in mid-March 1997 and be poured by the end of April 1997. PGE plans to respond to the issues discussed during the meeting. A representative from Oregon's Office of Energy attended the meeting.

A member of the public attended the non-proprietary portion of this meeting. Proprietary information was discussed at the technical exchange portion of this meeting, however, no proprietary information was disseminated. No regulatory decisions were requested or made.

Docket 72-17

Attachments: 1. Attendance List 2. PGE Slides

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	Ī	Dockets 72-17 (50-344)			NRC	File Ce	enter	ter PUBLIC			NMSS R/F			
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3/21/97 :dd

ATTENDANCE LIST MEETING BETWEEN THE U.S. NUCLEAR REGULATORY COMMISSION AND PORTLAND GENERAL ELECTRIC COMPANY FEBRUARY 26, 1997

NAME

ORGANIZATION

Charles J. Haughney Susan F. Shankman Fritz Sturz Dennis G. Reid Lawrence E. Kokajko Michael Franovich David Tang Steve Hogsett Thomas Matula Donald E. Carlson K. C. Leu C. G. Interrante Lee Thomas Mike Masnik H. Ray Pate Dan Gildon Mike Lackey Stephen Quennoz Ted Bushnell Chris Dieterle L. R. Walker Jay Rollo Bill McConnaghy David Williamson John Stokley Steve Mirsky Roy Karimi Adam Bless Robert E. Sweeney

NRC/NMSS/SFPO NRC/NRR/PDND NRC/NRR/PDND PGE PGE PGE PGE PGE PGE PGE Sierra Nuclear Sierra Nuclear SAIC SAIC SAIC SAIČ Oregon Office of Energy IBEX

ATTACHMENT 1





NRC -- PGE MANAGEMENT MEETING FEBRUARY 26, 1997

AGENDA

TITLE: NRC	Management Meeting for the Trojan ISFSI Application									
Opening:	Dennis Reid, NRC Project Manager, Trojan ISFSI Charles Haughney, Acting Director, SFPO Eric Leeds, Section Chief, SFPO									
Project Overview:	Stephen Quennoz, Trojan Site Executive									
Project Schedule:	Michael Lackey, General Manager, Engineering and Decommissioning									
	 Site Construction and Component Fabrication Preoperational Inspections and Testing Licensing Activities 									
Communication:	Ray Pate, Manager Licensing, Compliance and Commitment Management									
	 10 CFR 50, 72, and 71 Interfaces Review Process PGE-NRC Expectations ISFSI Safety Analysis Report Revisions Status of State ISFSI Review 									
Technical Topics:	Dan Gildow, Manager Decommissioning Planning									
	 Basket Coatings Pad Design Transfer Station (including Seismic Structural Analysis) Basket Deceleration Under Drop Conditions for Part 72 Criticality Fuel Cladding Temperature Limits (Methodology/Assumptions) Fuel Debris Program Procedures for Cask Loading ISFSI Operating Procedures 									

TROJAN NUCLEAR PLANT

Independent Spent Fuel Storage Installation Project Overview



Stephen M. Quennoz Trojan Site Executive

Trojan Decommissioning Schedule

1 1

Dormanant	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	1 4 A	2015	2016	2017	2018	2019
Shutdown			1 1 1 1						1 1 1 1 1 1							
D-Plan Submittal		1 1 1	7	<u>}</u>												
NRC/State Approval of D-Plan		1 1 1 1 1	t 1 1 1 1 1	1 1 1 1 5	\$											
Large Component Removal Project	-	1 1 1 1 1			1 1 1 1 1	1 1 1 1 1				 	0 1: 1: 1: 2: 2: 2: 2: 2: 2: 2: 2: 2: 2: 2: 2: 2:				8 3 6 1 8	
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Final Radiation Survey		1 1 1	- 6 1 1 1	- 	t 2 0 1	 	1 1 1 1	L]] [' 		1 1 1 1	t 1 1 1	8 1 8 8	1 1 7 1	
Non-Contaminated Building Demolition		r 1 1	 	1 1 1	1 0 0		• • •	• • • •	, , , ,	, , , ,	• • • •	: : :	, , , ,	! ! !		

ISFSI PROJECT IMPACT OF DELAY

- ♦ DELAYS FULL SCALE DISMANTLEMENT PERIOD
 - Potential loss of key personnel
 - Current LLRW disposal site rate agreement expires in 2001
- EXTENDED WET STORAGE PERIOD
 - Adds > \$6 Million annually to estimated costs

ISFSI PROJECT HISTORY

- STORAGE ONLY SYSTEM INCORPORATED INTO INITIAL DECOMMISSIONING STRATEGY AND INITIAL COST ESTIMATE
- DISCUSSIONS WITH NRC INDICATED DECOMMISSIONING OF SPENT FUEL POOL WOULD REQUIRE A TRANSPORTABLE SYSTEM
- ♦ BEGAN PREPARATION OF A BID SPECIFICATION 03/01/94
- ♦ ISSUED BID SPECIFICATION 09/29/94
- AWARDED CONTRACT TO SIERRA NUCLEAR
 06/05/95
- ♦ SNC SUBMITTED 10CFR71 APPLICATION 12/20/95
- ◆ PGE SUBMITTED 10CFR72 APPLICATION 03/28/96

ISFSI PROJECT OBJECTIVES

- SAFELY STORE TROJAN SPENT NUCLEAR FUEL
 - Intact Fuel with control components
 - Failed Fuel
 - Fuel Debris
 - GTCC Waste
- ◆ FACILITATE DECOMMISSIONING
- ♦ ALIGN WITH DOE FUEL STRATEGY (MPC BASED)
- MINIMIZE TROJAN SPENT FUEL POOL MAINTENANCE COSTS
- PREPARE SPENT FUEL FOR EVENTUAL DOE ACCEPTANCE

ISFSI PROJECT DESCRIPTION

- ♦ SNC TRANSTOR[™] SYSTEM
 - 24 assembly storage basket with double seal-welded stainless steel shell
 - Steel-lined thick walled concrete vertical storage casks
- ◆ 10CFR72 SITE SPECIFIC LICENSE FOR STORAGE
- DESIGNED TO BE COMPLETELY INDEPENDENT OF SPENT FUEL POOL ONCE LOADED
 - Off normal overpack
 - Transfer station
- ◆ 10CFR71 LICENSED TRANSTOR[™] SHIPPING CASK FOR EVENTUAL OFF-SITE TRANSPORT



THE TRANSFER CASK

TranStorTM SYSTEM COMPONENTS

PGE ROLE IN ISFSI DESIGN FABRICATION AND CONSTRUCTION

- PGE REVIEWED AND APPROVED SNC QA PROGRAM
- PGE PERFORMS QA AUDITS, SURVEILLANCES, AND QC INSPECTIONS OF SNC, SNC SUBVENDORS AND FABRICATORS
- PGE REQUIRED VALIDATION PACKAGES FOR ALL SNC CALCULATIONS
- PGE REVIEWED AND CONCURRED WITH ALL CALCULATIONS AND DESIGN DOCUMENTS
- ◆ PGE VALIDATED ISFSI SAFETY ANALYSIS REPORT (SAR)
- ♦ PGE REPRESENTATIVE ON-SITE AT SNC OFFICE
- PGE DEVELOPING ALL PROGRAMS AND PROCEDURES FOR TESTING, LOADING AND OPERATING THE ISFSI
- PGE MANAGING PAD CONSTRUCTION AND SECURITY SYSTEM
 INSTALLATION
- PGE RESPONSIBLE FOR BASKET LOADING AND HANDLING OPERATIONS





Michael B. Lackey

General Manager

Engineering and Decommissioning

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02APR97	17APR97			Fuel Bidg. Cra	ne Load Test/L	oad Certificate			-	
24JUL97	18SEP97				install impa	ct Limiters/Cor	nplete Fuel Bld	g. Prep		
Fuel Inspection										
20JAN97A	10MAR97		Fuel Inspe	ction						
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ISFSI Staffing	•					1		1		
	02SEP97*				ISFS \diamond	Si Specialists Q	valified & Staff	ed		
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COMMUNICATIONS



Ray Pate

Manager Licensing, Compliance and Commitment Management

ISFSI INTERFACE

Successful ISFSI Licensing

PART 50 PART 72 PART 71



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- LCA 237 CASK LOADING
- LCA 239 SFP DEBRIS
- LCA 240 PREOPERATIONAL TESTING
- LCA 242 ISFSI FOOTPRINT

PART 50 PROCEDURES

- INTERFACING PART 50/72 PROCEDURES
 - CERTIFIED FUEL HANDLERS
 TRAINING PROGRAM
 - FUEL TRANSFER & REFUELING EQUIPMENT CHECKLIST
 - FUEL MOVEMENT PREPARATION
 - SFP BRIDGE CRANE OPERATING INSTRUCTION
 - SPENT FUEL ASSEMBLY HANDLING TOOL OPERATING INSTRUCTION
 - ISFSI FUEL LOADING PLAN
 SEQUENCE
 - VACUUM DRYING SYSTEM

- OFF-NORMAL AND
 ACCIDENT CONDITIONS
 - FUEL HANDLING EMERGENCY PROCEDURES

1.1.2

- CASK DROP IN THE FUEL BUILDING
- PRESSURIZED LINE
 RUPTURE
- VACUUM DRYING TIME EXCEEDING ADMINISTRATIVE LIMITS



PART 72 PROGRAMS AND PROCEDURES

PROGRAMS

- RADIATION PROTECTION
- ENVIRONMENTAL AND EFFLUENT MONITORING
- FIRE PROTECTION
- TRAINING
- EMERGENCY PLAN
- SECURITY PLAN
- CASK HANDLING AND STORAGE
- STRUCTURAL INSPECTION

- PROCEDURES
 - PHYSICAL SECURITY

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- RADIOLOGICAL
 EMERGENCY
- FIRE PROTECTION
- MODIFICATION CONTROL
- TRAINING
- OPERATION AND
 SURVEILLANCE
- WASTE CLASSIFICATION, LOADING SEQUENCE AND INVENTORY
- OFF-NORMAL AND ACCIDENT
- MATERIAL ACCOUNTING
- RADIATION PROTECTION



- OF COMPLIANCE FOR THE PART 71 TRANSTOR™ SYSTEM
- ASSURES PGE OF EVENTUAL TRANSPORTATION TO U.S. DOE HIGH LEVEL WASTE FACILITY

ISFSI SAFETY ANALYSIS REPORT REVISIONS

- DESIGN REVIEWS
 - Revisions as a Result of Part 72 Regulatory Review
 - Revisions as a Result of Transtor[™] Part 71 Regulatory Review

♦ FABRICATION

10CFR50.59/72.48 Review Process

REVIEW PROCESS PGE AND NRC EXPECTATIONS

- ISFSI PROJECT IS PGE'S MOST IMPORTANT DECOMMISSIONING PRIORITY
- PGE HAS A DECOMMISSIONING STAFF WHICH FACILITATES PROMPT RESPONSE TO NRC QUESTIONS AND CONCERNS
- PGE SUPPORTS COMMUNICATION WITH REVIEWERS REGARDING TECHNICAL ISSUES
- NRC SUPPORT OF PROJECT MILESTONES

STATE ISFSI REVIEW

PROCESS

- Purpose
- Capacity and Safety Standards
- Alternative Spent Nuclear Fuel Storage
 - Other than SFP Requires Rule Change
 - ISFSI
 - 11 Subsections concerning areas of Design, Cask, Radiation and Effluent Monitoring, etc.
- Report Requirements
- ♦ CURRENT STATUS





Daniel C. Gildow Manager Decommissioning Planning ISFSI Project Manager

BASKET COATINGS

- BACKGROUND
 - Bulletin 96-04
- SELECTION
 - 3 Coatings
 - PGE QA Oversight
- ♦ TEST SCHEDULE
 - Boric Acid Immersion Scoping Test (Room Temp) Complete
 - Radiation Tolerance Test Complete
 High Temperature Qualification Test 03/14/97
 - Boric Acid Immersion Test (Elevated Temp)
 04/11/97
 - INCORPORATED INTO DESIGN 06/01/97

ISFSI PAD DESIGN

- REINFORCED CONCRETE
 - ACI 318
- FOUNDATION ROCK
- ACCESS ROAD
- ♦ DESIGNED TO WITHSTAND SME (0.38g)
- ◆ PGE QA/QC OVERSIGHT OF CONSTRUCTION



TRANSFER STATION DESIGN

- BACKGROUND
- PURPOSE -- PROVIDES HORIZONTAL SUPPORT FOR TRANSFER CASK
- ♦ IMPORTANT TO SAFETY
- ♦ STEEL FRAME STRUCTURE
 - ASTM A36 Framing
 - ASTM A325 Bolting
- ANCHORS
- SLIDING COLLAR



TRANSFER STATION SEISMIC STRUCTURAL ANALYSIS

- ♦ SEISMIC EVENT (0.38g SME)
- HORIZONTAL FORCES (0.5g FOR TRANSFER CASK AND FRAMING)
- ♦ AISC STEEL CONSTRUCTION MANUAL

TRANSFER STATION MISSILE IMPACT ANALYSIS

- NUREG 1407 EXTERNAL EVENTS
- ♦ PROBABILISTIC RISK ASSESSMENT
- ♦ ERIN ENGINEERING
- MISSILES
- ♦ RESULTS

BASKET DECELERATION FOR DROP CONDITIONS

- METHODOLOGY EPRI NP-7551
- ♦ TARGET HARDNESS
- ♦ LIMITING DECELERATIONS

RESULTS AND CONCLUSIONS

- DROP LOADS
 - Concrete Cask 28.2g
 - Shipping Cask 58.7g
- ♦ BASKET END DROP LIMIT 124g

CRITICALITY

♦ WET BASKET LOADING (PART 50)

- Part 50 LCA-237
- New Trojan Specific Calculation
- No Credit Taken For 2000 PPM Borated Water

DRY STORAGE PERIOD (PART 72)

- Trojan Specific Calculation
- Criticality Controlled by Geometry (K_{eff} <.41)
- No Credit Taken for Boral
- No Long Term Efficacy Program Required
- TRANSPORTATION (PART 71)
 - SNC Part 71 Submittal
 - Generic Calculation captures Trojan Fuel
 - Boral Credited for Criticality Control
 - Functionality of Boral

FUEL CLAD TEMPERATURE LIMIT CALCULATION

- DESIGN THERMAL LOAD 26 kW
- ♦ TROJAN ADMIN LIMIT 24 kW
- METHODOLOGY
 - PNL 6364
 - 40 GWD/MTU, 5 Year Cooled
 - 705 Degrees F

FAILED FUEL/FUEL DEBRIS PROGRAM

- BACKGROUND
 - LCA 239
- PROCESS ORGANICS
- COMPONENTS
 - Failed Fuel Can
 - Process Can
 - Process Can Capsule
- PACKAGING INTERFACE



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(MATERIAL STAINLESS STEEL)



CASK LOADING PROCEDURES

- IMPACT LIMITERS/SAFE LOAD PATH
- OPERATIONS IN THE CASK LOAD PIT
 - Load Fuel Assemblies
 - Place Shield Lid
- ♦ OPERATIONS IN THE CASK WASH PIT
 - Draining
 - Drying
 - Backfilling
 - Welding
- BASKET TRANSFER TO CONCRETE CASK
- STARTUP TEST
- MOVE CONCRETE CASK TO PAD

FIGURE WITHHELD UNDER 10 CFR 2.390

ISFSI OPERATING PROCEDURES

- CASK MOVEMENTS ON PAD
- BASKET TRANSFER
 - To Shipping Cask
 - To Overpack
- ♦ SURVEILLANCES/INSPECTIONS



Reg. Guide 1. 76 Region III Infinites (V = 240 mph)

Missiles	<u> Weight (#)</u>	Dimensions	Region III Horiz, wel (ft/sec)
A Wood'Plank	114.40	3.62"x11.38"x12.0"	190.24
B 6" Sch 40 pipe	28 6	6.61"øx15.03'	32.80
C 1" Steel rod	8.8	1"øx3.12'	26.24
D Utility pole	1122	13.50"øx35.04'	8 5.28
E 12" Sch 40 pipe	748	12.60°øx15.03'	22.96
F Automobile	3982	16.41'x6.56'x4.27'	134.48

Vertical velocities shall be taken as 70% of the postulated horizontal velocities. Except for missile C above which shall be assumed to have the same velocity in all directions. Missiles A, B, C, and E are to be considered at all elevations and missiles D and F at elevations up to 30 feet above grade level.

Trojan Missiles (Vm	= 200 mgh)		
1) Wood Plank	12 8 #	4"x12"x12.0'	293.33 ft/sec
2) 3" Sch 40 pipe	75 .8 0#	3.50"øx10.0'	110.00 ft/sec
3) Automobile (< 25' above grade	4000#		58.67 ft/sec

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