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FACIL:50-323 Diablo Canyon Nuclear Power Plant, Unit 2, Pacific Ga 05000323
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KNIGHTON,G.W. Licensing Branch 3

SUBJECT: Forwards info re safety-related equipment qualification records,per 841031 request.

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TITLE: OR/Licensing Submittal: Equipment Qualification

NOTES:J Hanchett 1cy PDR Documents. 05000323

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JAMES D. SHIFFER
VICE PRESIDENT
NUCLEAR POWER GENERATION

November 29, 1984

PGandE Letter No.: DCL-84-363

Mr. George W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Re: Docket No. 50-323
Diablo Canyon Unit 2
Equipment Qualification

Dear Mr. Knighton:

As requested in the NRC Staff's letter dated October 31, 1984, PGandE has reviewed the equipment qualification records for the Diablo Canyon Unit 2 safety-related equipment. The requested information on equipment qualification is enclosed.

Kindly acknowledge receipt of this material on the enclosed copy of this letter and return it in the enclosed addressed envelope.

Sincerely,

J. D. Shiffer

Enclosure

cc: H. E. Schierling
Service List

A048
1/1

ENCLOSURE

DIABLO CANYON UNIT 2
EQUIPMENT QUALIFICATION

1. For seismic and dynamic qualification and for pump and valve operability assurance:

   a. Provide a list of all safety-related electrical and mechanical equipment with differences between Units 1 and 2.

Response to 1.a

The safety-related electrical and mechanical equipment used in Unit 2 is the same as the corresponding Unit 1 equipment with the following differences:

1. Safety injection pump motors are built by different manufacturers

2. Two reactor coolant system temperature detectors (RTDs) in Unit 2 are built by a different manufacturer

3. One of four RCP upper bearing coolers on Unit 2 was modified because of nozzle loads

4. The spray additive tanks in each unit are the same but slightly different modifications were made to their supports

5. The diesel generator exhaust silencers are modified in Unit 1 and not in Unit 2 because of nozzle load differences

   b. Discuss changes between Units 1 and 2 in the seismic loading for equipment qualification due to changes in seismic hazards and errors in design, analysis and construction.

Response to 1.b

All Unit 2 safety-related electrical and mechanical equipment, including valves, were qualified to the specific seismic loadings at the equipment location. Qualification was achieved using the same methodology and criteria as for Unit 1 and is described in PGandE's Phase I Final Report for the Independent Design Verification Program (IDVP).

The Unit 2 seismic input, from ground and structures, is given for specific locations in three Design Criteria Memorandums (DCMs): one for design earthquake (DE), one for double design earthquake (DDE), and one for Hosgri. Most inputs are identical to the corresponding Unit 1 inputs. However, there are some differences in the turbine building, containment annulus, and the external pipeway. Where Unit 1 analyses enveloped Unit 2 equipment, no Unit 2-unique analyses were required. Where Unit 2 differences were not enveloped, unique analyses were performed.

The Unit 2 seismic input to equipment and valves from connected piping is provided by unique piping analyses in the same manner as was done for Unit 1.

As was done for Unit 1, field walkdowns were performed for each piece of equipment to assure that each test or analysis used for seismic qualification correctly considered the as-constructed condition.

2. For environmental qualification of electrical equipment important to safety:

   a. Provide a statement, and its bases, that Unit 2 is in compliance with the requirements of 10 CFR 50.49. This statement should indicate that, to determine compliance with 10 CFR 50.49, your review included: (a) equipment for all design basis accidents (b) non safety-related equipment whose failure could affect safety-related equipment and (c) post-accident monitoring equipment that must meet the requirements of Regulatory Guide 1.97.

Response to 2.a

The equipment environmental qualification (EQ) program for Unit 2 was performed simultaneously with that for Unit 1 and all qualification documentation apply to both units. The qualification review and analyses were documented in PGandE letters dated September 2, 1981 and June 25, 1984, and in PGandE's equipment qualification files. The review included safety-related electrical equipment for all design basis accidents and nonsafety-related equipment whose failure could affect safety-related equipment. This review has been performed in accordance with NUREG-0588 and has been accepted by the NRC in Safety Evaluation Report Supplement 15. Further, PGandE has reviewed the qualifications for post-accident monitoring equipment that must meet the requirements of Regulatory Guide 1.97. This review has been documented for both Units 1 and 2 in PGandE letters dated September 9, 1983 and September 4, 1984. PGandE has identified the monitoring equipment within the scope of 10 CFR 50.49 that is not environmentally qualified and justification for interim operation is provided in response to 2.c. below.

The environmental qualification of Class IE electrical equipment is an ongoing program to assure compliance with 10 CFR 50.49. Since the EQ review was performed and approved in 1981, PGandE has established surveillance and maintenance procedures to assure continued qualification of the equipment.

These procedures will be implemented prior to fuel loading for Unit 2. Based on the above, Diablo Canyon Unit 2 will be in compliance with 10 CFR 50.49 prior to fuel loading

b. Provide a list that includes all equipment within the scope of 10 CFR 50.49, installed or to be installed in Unit 2, that is different from equipment qualified for Unit 1. Provide qualification information of all equipment on this list.

Response to 2.b

With the exception of the two reactor coolant system RTDs and the safety injection pump motors, manufactured by Reliance Electric, all Unit 2 equipment within the scope of 10 CFR 50.49 is the same as the corresponding equipment in Unit 1. The system component evaluation work sheet of the Reliance motor is attached. Additional information on the environmental qualification of the motors and the two reactor coolant system RTDs is available in the project files (File Nos. EH 20 and IH 34, respectively).

c. For equipment within the scope of 10 CFR 50.49 that is not environmentally qualified, provide justification for interim operation in accordance with the requirements of paragraph (i) of 10 CFR 50.49.

Response to 2.c

All Unit 2 equipment within the scope of 10 CFR 50.49 is environmentally qualified except for one device listed in Regulatory Guide 1.97, Revision 3. This device is the containment air temperature detector (RTD). The detectors currently installed in Unit 2 are not environmentally qualified. Two environmentally-qualified RTDs have been purchased for installation. However, since these detectors are not yet available from the manufacturer, they cannot now be installed. They will be installed by initial criticality of Unit 2.

The present detectors are primarily used to monitor temperature inside containment during normal plant operation. The qualified RTDs will be installed for post-accident monitoring. Since the plant will not be subject to power operation and there is no fission product inventory before initial criticality, it is not necessary to have the qualified RTDs installed earlier. Therefore, use of the present detectors for interim operation prior to initial criticality will not degrade the safety of the plant.

10 CFR 50.49(1) requires analysis to demonstrate that the plant can be safely operated pending completion of equipment qualification. Based on the above PGandE's analysis shows that subparagraph (5) of 50.49(i) is applicable.

3. In June of 1984 the Westinghouse Electric Corporation notified each of the Westinghouse plant owners of a possible unreviewed safety question concerning the temperature envelope resulting from a main steam line break with releases of superheated steam as related to the environmental qualification of exposed equipment. Discuss the environmental qualification of equipment in Unit 2 with respect to this matter in accordance with the requirements of 10 CFR 50.49(i). (Note: see also Item 2.c. above).

Response to 3

As discussed below, the environmental qualification of equipment in Unit 2, for a main steam high energy line break outside contaiment, was based upon temperatures which were greater than the temperature profile resulting from a main steam line break with release of superheated steam. Therefore, the environmental qualification of equipment in Unit 2 is satisfactory.

PGandE's current equipment qualification, for a main steam high energy line break outside containment, is based on the latest analysis performed as a result of the IDVP and the Internal Review Program (IRP). This analysis is based on the plant-specific mass/energy release data provided by Westinghouse and assumes a saturated steam blowdown.

In order to complete evaluation of other main steam high energy line break considerations related to jet impingement pressure on structures, a restricting orifice was added at the main steam containment penetration sleeves to reduce steam released from the hypothetical breaks assumed to occur in the main steam piping within these sleeves. These breaks were the governing main steam line breaks outside containment which affect equipment qualification, and the addition of the restricting orifices introduced approximately 50% conservatism in the mass/energy release rate used in the equipment qualification program which had been completed prior to these modifications.

Shortly after receiving the Westinghouse notification, PGandE requested Westinghouse to provide a new superheated plant-specific mass/energy release rate to assess the impact on the Diablo Canyon pressure/temperature analysis for compartments outside the containment. This new mass/energy release rate was compared with PGandE's old data. It was found that the enthalpy increases slightly (less than 10 Btu/lb) for a split break and approximately 10% (100 Btu/lb) for a double ended break at the end of the blowdown. This slight increase in enthalpy will have no impact on the current compartment analysis or the equipment qualification program since the actual possible blowdown has been greatly restricted by the addition of the orifice plates.

Attachment

E1t 20.

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION

Component: Electric Motor Safety Injection Pump.

Manufacture: Reliance

Model Number:

Accuracy (Instruments) Spec ____ Ref ____

Demon ____ Ref ____

ENVIRONMENT			(1) DOCUMENTATION REF*		(2)		MARGIN (Amount Test or Analysis Exceeds Required)
Parameter	Specification	Qualification	Specification	Qualification	QUAL METHOD	OUTSTAND ITEMS	
ANL-TEST: Post Accident Operating Time-Days		Note *		Note *	—		
ANL: Post Accident Operating Time-Days	365	>365	8	10, Pg 21	ANL	None	Note *
LOCA °F Temperature	Note 1						— °F
MSLB Temp. °F.							— °F
Pressure PSIG							— PSIG
Relative Humidity (%)							
Chem. Spray: Spray Duration							—
Chem. Spray: Spray Composition							
Chem. Spray: ppm Boron							— ppm
Chem. Spray: pH							
(Gamma) Radiation	7.43×10^5	1×10^8	6+6a	10, Pg 21	SEP	NONE	$+9.9\times10^7$
Accel. Aging		594 hrs. @ 250°C		11, Pg. 1	SEQ		
Aging Qualification	40yrs	>40yrs	DESIGN LIFE	9, Pg 1	ANL	None	Note 17 as applicable to motor windings.
Submergence: Min. Device Elevation	85 ft.	—	—	Note 5d	—	—	
Submergence: Flood Elevation	— ft.						
Submergence: Submergence	— ft.						

Submergence: Not Subject to Flooding.

*Documentation References: See Reference Tab in File

* Radiation test exceeded spec's by more than 10%. Radiation is only harsh environment.

NOTES

(1) Include page or specific item
(2) SIM = Simultaneous Test
SEQ = Sequential Test

SEP = Separate Effects
ANL = Analysis

ATTACHMENT