



PSE&G

Public Service Electric and Gas Company P.O. Box 236 Hancocks Bridge, New Jersey 08038

Nuclear Department

June 8, 1984

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Division of Licensing
Washington, D. C. 20555

Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch, No. 1

Gentlemen:

RESOLUTION OF TECHNICAL EVALUATION REPORTS
FOR ENVIRONMENTAL QUALIFICATION OF
SAFETY-RELATED ELECTRICAL EQUIPMENT
SALEM GENERATING STATION
UNITS NO. 1 AND 2
DOCKET NOS. 50-272 AND 50-311

In January, 1983, PSE&G received the Safety Evaluation Reports (SERs) regarding the Environmental Qualification of Safety-Related Electrical Equipment at Salem Generating Station, Units 1 and 2. The SERs each contained a Technical Evaluation Report (TER), written by Franklin Research Center under contract to the NRC, which noted a number of environmental qualification deficiencies for safety-related electrical equipment at Salem Generating Station. On April 24, 1984, a meeting was held with members of your staff to discuss PSE&G's proposed method of resolution for each of those deficiencies. The proposed resolution, as discussed with your staff, for each of the environmental qualification deficiencies listed in the TERs, is summarized in Enclosure 1 to this letter. Discussions also took place at the meeting regarding PSE&G's general methodology for compliance with 10 CFR 50.49, "Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants," which became effective February 22, 1983. The purpose of this letter is to provide documentation of the discussions held at the April, 1984 meeting.

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The Energy People

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Enclosure 1 to this letter contains a master list of electrical equipment for environmental qualification within the scope of 10 CFR 50.49. The master list contains a summary description of the method of environmental qualification for each equipment item as discussed with your staff at the April 24, 1984 meeting. Enclosure 1 also provides the resolution of the Franklin TER discrepancies. The equipment list is identical to the list of equipment submitted in response to Paragraph (g) of 10 CFR 50.49 by our letter dated May 9, 1983, regarding "Environmental Qualification of Safety-Related Electric Equipment within the Scope of 10 CFR 50.49." Pursuant to 10 CFR 50.49 (g), the environmental qualification of electrical equipment will be complete by the second refueling outage after March 1982 for both Unit 1 (current outage) and Unit 2 (outage scheduled for January 1985). The justifications for continued operation (JCO's) previously submitted are still applicable for both units.

The two generic deficiencies listed in the SER and the attached TER for the Salem Generating Station were "submergence and chemical spray" (TER, Sections 4.3.4 and 4.3.5). Enclosure 2 provides our responses to these generic issues.

At the April 24, 1984 meeting, your staff also requested confirmation that all design-basis events which could result in a potentially harsh environment (including flooding outside containment) were addressed in identifying safety-related electrical equipment which was to be environmentally qualified. The environmental effects resulting from all postulated design-basis accidents documented in Chapter 15 of the Salem Generating Station Updated Final Safety Analysis Report (UFSAR), including the Loss-of-Coolant Accident (LOCA) and the Steam-Line Break Accident (SLBA) inside containment, were considered in the identification of safety-related electrical equipment which was to be environmentally qualified. The environmental effects resulting from High-Energy Line Breaks (HELBs) outside containment were also evaluated in the identification of this equipment. Therefore, all design-basis events were considered in the identification of electrical equipment within the scope of Paragraph (b) (1) of 10 CFR 50.49 (i.e., "Safety-related electric equipment...relied upon to remain functional during and following design basis events...").

The method of identification of electrical equipment within the scope of Paragraph (b) (2) of 10 CFR 50.49 (i.e., "Nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions...") is described in Enclosure 3 to this letter. No additional electrical equipment at Salem Generating Station was identified during this review, which had not been previously included in the master list. The method used to identify electrical equipment within the scope of Paragraph (b) (3) of 10 CFR 50.49 (i.e., "Certain post-accident monitoring equipment") involved a variable-by-variable comparison of the specific requirements of Regulatory Guide 1.97, "Instrumentation...to Assess Plant and Environs Conditions During and Following an Accident," to the design of Salem Generating Station. An evaluation of this comparison was then conducted to determine which instrumentation and sampling equipment at Salem Generating Station required environmental qualification. The results of this evaluation are described in our September 28, 1983 letter on "Implementation of Regulatory Guide 1.97 for Emergency Response Capability." The applicable Regulatory Guide 1.97 variables will be included as part of the master list after resolution and approval has been received from the NRC.

Additionally, the concerns identified in NRC IE Information Notices 81-29, 82-52, and 83-72 have been considered in our review.

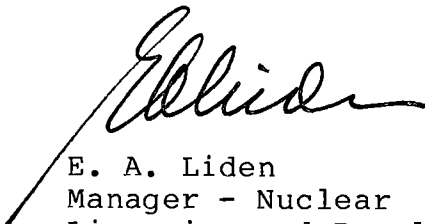
In conclusion, we believe that the "Master List of Electrical Equipment for Environmental Qualification, Salem Generating Station, Units 1 and 2", complies with the requirements of paragraph (b) of 10 CFR 50.49.

The environmental qualification documentation maintained in the Salem Generating Station Equipment Qualification (EQ) file complies with the requirements of 10 CFR 50.49. The Salem Generating Station EQ File is available for NRC audit at any time. The file was verified in 1982, and we are currently reviewing the verification documentation to ensure its completeness. We also believe that Salem Generating Station can continue to operate without undue risk to the public health and safety based on the completed equipment qualification supplemented by the JCOs previously submitted.

As we discussed at the April 24, 1984 meeting, it is requested that supplemental SERs be issued to indicate that PSE&G's Equipment Qualification Program, as described in this letter, meets the requirements of 10 CFR 50.49 and that the deficiencies noted in the SERs dated January, 1983 are considered resolved.

We would be pleased to answer any questions you may have regarding the enclosed information or our request for the supplemental SERs.

Sincerely,

A handwritten signature in cursive script, appearing to read "E. A. Liden". The signature is written in dark ink and is positioned above the typed name and title.

E. A. Liden
Manager - Nuclear
Licensing and Regulation

Attachments

C Mr. Donald C. Fischer
Licensing Project Manager

Mr. James Linville
Senior Resident Inspector

ENCLOSURE 1

MASTER LIST OF ELECTRICAL EQUIPMENT

FOR ENVIRONMENTAL QUALIFICATION

SALEM GENERATING STATION, UNITS 1 AND 2

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
1	RC Hot/Cold Leg Narrow Range Temperature - Rosemount Model 176KF RTD	IIa	a. Qualification Documentation b. Aging c. Qualified Life d. T/P Exposure: Profile e. Spray f. Testing g. Instrument Accuracy	Will be replaced during present outage with a qualified RTD. RDF Corp. 21204.	Qualified PSE&G EQ Report No. 45. Westinghouse Report WCAP-8687, Sup. 2 - E05A Rev. 1, March, 1982
2	RC Hot/Cold Leg Wide Range Temperature - Rosemount Model 176 KS RTD	IIa	a. Qualification Documentation b. Aging c. Qualified Life d. T/P Exposure: Profile e. Spray f. Testing g. Instrument Accuracy	Will be replaced during present outage with qualified RTD Model Conax P/N7A76-10000-01	Qualified PSE&G EQ Report No. 40. Conax Report IPS-875, Oct. 15, 1982.
3	Pressure Transmitter, Reactor Coolant System Pressure Post Accident Monitoring - Barton Model 763 Prod Lot 2	Ib	a. Aging b. Qualified Life c. T/P Exposure: Profile d. Test Failures	Replaced with qualified Rosemount Model 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
4	Differential Pressure Transmitter Pressurizer Level - Barton Model 764 Pro Lot 2	Ib	a. Aging b. Qualified Life c. T/P Exposure: Profile d. Test Failures	Replaced with qualified Rosemount Model 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
5	Pressure Transmitter, Pressurizer Pressure Trip Input to Reactor Protection System, Rosemount Model 1153AGA	Ib	a. Similarity b. Aging c. Qualified Life	Replaced with qualified Rosemount Model 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3.
6	Solenoid Valve, Air Supply Valve for Pressurizer PORV's - ASCO Model 821J02	IIIa	None	Exempt - None Required	Not in the scope of 10 SP CFR 50.49
7	Limit Switch, Position Indication for Valves - NAMCO Model EA 180	Ia	None	None Required	Qualified
8	Differential Pressure Transmitter, Accumulator Level Indication - Barton Model 384	Ib	a. Qualification Documentation	Replaced with qualified Rosemount Model 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
9	Transducer, Control for Atmospheric Relief Valves MS10's - Fisher Govenor Model 546	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
10	Pressure Transmitter, Steam pressure control for Atmospheric Relief Valves - Fischer and Porter Model 50EP1041	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49

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11	Electric Motor, Cooling to Rod Drive Mechanisms - Westinghouse Model FFC2F25F	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
12	Limit Switch, Operator Indication & Valve Control Masoneilan Model 4962	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch	Qualified per PSE&G EQ Report No. 13. Wyle Lab. Report 17448-17 Dec. 2, 1980. See discussion Item No. 36
13	Control Switch, Local Control of MS167 Hydraulic Pump - Micro Switch Model 910	Ib	a. Qualification Documentation	Removed from the Control Circuitry.	Local feature for Main Steam Stop Valve for easy maintenance. Removed from Control Circuitry
14	Local Control of MS167 Hydraulic Pump - Terminal Block, Electrical Connection - Cinch Jones Model	Ib	a. Qualification Documentation	Removed from the Control Circuitry.	Local feature for Main Steam Stop Valve for easy maintenance. Removed from Control Circuitry
15	Differential Pressure Transmitter, Auxiliary Feedwater Flow - Fischer and Porter Model 10B2495	Ib	a. Similarity b. Aging c. Qualified Life d. T/P Exposure: Duration Profile e. Test Failures f. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
16	Differential Pressure Transmitter - Fisher & Porter Model 10B2495. FA1416, FA14919, FA0432 - Monitors RHR Pump Discharge. FA-0218 Monitors Containment Spray FA31602-1, FA31652-1, FA31722-1, FA31762-1 = Flow Control for Service Water Valves.	Ib	a. Similarity b. Aging c. Qualified Life d. T/P Exposure: Duration Profile e. Test Failures f. Instrument Accuracy	Replaced all except FA-0218 Containment Spray Addition Tank Header, with qualified Rosemount 1153D Pressure Transmitters; will replace FA-0218 during Present Outage with a qualified Rosemount 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3.
17	Square Root Extractor, Auxiliary Feedwater Flow - Fischer & Porter Model 50ES3212	Ib	a. Qualification Documentation	Will be relocated to a mild environment during present outage.	Originally Controller was located in Inboard/Outboard Penetration area. Will be relocated to Electrical Penetration area (Benign).
18	Pump Motor, Drives Charging/Safety Injection Pump - Westinghouse Model	IIa	a. Qualification Documentation b. Similarity		FRC comments resolved and motors are qualified per PSE&G EQ Report No. 16. See column on resolutions.

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18 (Cont'd)			Franklin Research concerns: a. Lack of traceability of installed motors to the reference test report. b. Lack of documented evidence for the qualification of the motor to lead splice c. The insulation class was not stated. d. The installed grease (bearing) lubricant was not identified.	a. Our analysis of WCAP 8754 contained in PSE&G EQ-16 Report identified an anomaly concerning insulation thickness. Westinghouse answered our question via a letter dated March 24, 1981 contained in EQ-15 volume 2 Tab 1505. Westinghouse has used only thermolastic epoxy insulation in their nuclear motors. b. There are actually two splices per phase in the motor. One between the thermolastic epoxy and the internal cable and a second at the lead box. The first splice was supplied with the motor from Westinghouse. As stated on page 1-1 of WCAP8754, Environmental Qualification of Class IE Motors for Nuclear Out-of-Containment Use, "...all large AC motors manufactured by Westinghouse for nuclear service employ the same insulation system and types of bearings, a generic qualification of these motors is possible." The splice material is actually qualified by WCAP 7829, Fan cooler Motor Unit test, under component testing for Scotch 70 splice tape summarized in Table 22 on page 46. The second splice is made with Okonite splice kits. As stated in 2A, only thermolastic epoxy insulation with thermal endurance as shown in Figure 4.1, page 4-2 of WCAP 8754 is used. The curve is equal to or greater than the requirement of Class F insulation. d. PSE&G used Westinghouse approved Terresstic No. 46, manufactured by Humble Oil and Refining	
19	Pump Motor, Drives RHR Pump	IIa	See Franklin Research concerns #18	See Franklin Research concerns #18	FRC comments resolved and motors are qualified.
20	Transducer, Control for Valves 1RH20, 11RH18, 12RH18 - Fisher Controls Model 546	IIIa	None		Exempt from Qualification Not in the scope of 10 CFR 50.49
21	Flow Transmitter, RHR Pump Recirc. Flow Control FA2569, FA2481 - Barton Model 289A	IIIa	None	Not in the scope of 10 CFR 50.49 Exempt from Qualification	

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
22	Solenoid Valve, Pilot Valves for Main Steam Isolation Valves - ASCO Model FT8321A2	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve.	Qualified per PSE&G EQ Report No. 44. ASCO Report No. AQR-67484 Rev. 0.
23	Level Transmitter, Containment Spray Additive Tank Level Indication - Barton Model 332/352	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
24	Electrical Connector, Rod Position Indication Wire Connectors - AMP Model 4806R147S 4800R147P	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
25	Solenoid Valve, Control for Main Steam Isolation Valves - ASCO Model FT8321A4	Ib	a. Qualification Documentation b. Similarity	Replaced with qualified ASCO NP Series Solenoid Valve.	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
26	Limit Switch, Position Indication for Valves - NAMCO Model D2400XST	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch.	Qualified per PSE&G EQ No. 13. See discussion for Item No. 36. Wyle Lab Report 17448-17.
27	Limit Switch, Position Indicator for Valves - Masoneilan Model 4962.	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch.	Qualified per PSE&G EQ Report No. 13. See also discussion for Item No. 36. Wyle Lab Report 17448-17
28	Limit Switch, Position Indicator and Valve Control - NAMCO Model D2400X	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch.	Qualified per PSE&G EQ Report No. 13. See also discussion for Item No. 36. Wyle Lab Report 17448-17.
29	Square Root Extracter, Flow Pressure Control. Fischer & Porter Model 50ES3212	Ib	a. Qualification Documentation	Relocated to a mild environment,	Originally was located in Mechanical Penetration area. Relocated in Switchgear room (Benign)
30	Flow Controller Fischer & Porter Model 53EG3000	Ib	a. Qualification Documentation	System redesigned; function is now performed by a mechanical device.	Modified from Electronic to Pneumatic Control
31	Transducer Flow/Pressure Control Fischer & Porter Model 53E13000	Ib	a. Qualification Documentation	System redesigned; function is now performed by a mechanical device	Modified from Electronic to Pneumatic Control
32	Pressure Transmitter Barton Model 332 351	Ib	a. Qualification Documentation	Replaced with qualified Rosemount Model 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle lab Report 45592-3.
34	Limit Switch, Position Indicator for valves. NAMCO Model D2400X	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch	Qualified per PSE&G EQ Report No. 13. See discussion for Item No. 36. NAMCO Report QTR-105 - Rev. 3, Aug. 20, 1981).

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
35	Solenoid Valve, Pilot Valve for Safety-Related Control Valves. ASCO Model NP Series	IIa	a. Submergence	PSE&G has analyzed the potential loss of power (due to submergence) and this analysis has been reviewed and approved by the NRC (Reference in Salem FSAR response to Question 6.28)	FRC question resolved. Qualified per PSE&G EQ Report No. 44. ASCO Report AQR-67484 Rev.0
36	Limit Switch, Valve Position Indicator NAMCO Model EA-180	IIa	Franklin Research concerns: a. The method used by Salem to seal the Limit Switches. b. The concentration of chemical spray used in the test as compared to in the plant. c. The length of the qualified life of the Limit Switches.	a. Conax Connectors are used to seal the Limit Switches from the environment. b. The test chemical spray was composed of boric acid, water sodium thiosulfate & sodium hydroxide at a ph between 10 & 11 with a coverage of .015 gallons/min./ft ² . The test was maintained for 4 days. Plant condition called for a ph greater than 8.5 for 22.5 hours. c. Qualified life of over 40 years. Maintenance requirements: NAMCO Controls, Maintenance Instructions. PSE&G Field Directives to Station	NAMCO Model EA-180 Limit Switches are qualified by manufacturer. Qualified per PSE&G EQ Report No. 13. Wyle Lab Report No. 17448-17
37	Instrumentation and Control Panel, Enclosure for Instrumentation - PSE&G Model 1, 2, 3, 4 Bay	IIIB	None	None Required	Outside the scope of 10 CFR 50.49
38	Motorized Valve Actuator, Motive Power for Valve Openings/Closings Limitorque Model SMB, Class B Insulation	IIa	a. Qualification Documentation b. Aging	Will be qualified or replaced during present outage	
39	Terminal Block, Connection Point within PSE&G Terminal Box/Panel - Buchanan Model 2B112N	Ia	None	None Required	Qualified
40	Electrical Cable Splice, Termination/Junction of Electric Cables - Raychem Model WCSF N	Ia	None	None Required	Qualified
41	Electrical Penetration, Provide Electrical feeds thru Containment Boundary - Conax Model canister type LVP MVP	Ia	None	None Required	Qualified
42	Electrical Cable, American Insulated Wire	IIc	a. Aging b. Qualified Life	PSE&G is reviewing the cable documentation with the intent of extending the life of the cable. Wyle Lab is in the process of testing the cable for extended life.	

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
43	Electrical Cable, Samuel Moore, EPR (EPDM) Insulation	IIC	a. Aging b. Qualified Life		Qualified per PSE&G EQ Report No. 36 NTS Report 558-1088, Oct. 9, 1981.
44	Electrical Cable, Boston Insulated Wire, Bostrad 7E Insulation Bostrad 7 ESPE Jacket	I1a	a. Qualification Documentation b. Similarity c. T/P Exposure: Profile Franklin Institute had several questions concerning the several types of cable: a. PSE&G has not provided information either on the SCEW sheets or in analysis EQ-05 to establish that the installed cable constructions are the same as those constructions which successfully passed a test which envelopes the required Salem Parameters. b. The report also refers to F-C3859-1 for test results. Report F-C3859 is a report of testing conducted on various BIW cable construction in accordance with IEEE 383-74. The cables tested and the results of the test are reproduced on page 5i. The report indicates that some constructions successfully passed test while other cable constructions did not.	a. BIW has retested this product to expand and update their previous testing. Analysis of that report is contained in EQ Report No. 34. BIW letter dated May 24, 1982, indicates that all of the nuclear EPR insulation (Bostrad 7E) manufactured by BIW is of the same formulation. This connection is established by the QAF21 forms attached to all safety-related orders. Therefore, the appropriate correlation has been established. b. The questionable cables reported on page 5i: are for multi-conductor flame retardant XLPE and single conductor #16EPR cable. The BIW part number indicates that the cables were laboratory test samples (LSS number vs a part number). The BIW report indicates, and verbal discussions with BIW have confirmed, that the compounds used in the questionable laboratory samples are not used in nuclear products.	Qualified per PSE&G Report No. 34. BIW Cable Co. Report B915, Nov., 1980
	Boston Insulated Wire XLPE Coaxial Cable		a. Report B912 (1705) is a test summary which discusses test results on Triaxial cable. The Test profile does not envelope the Salem profile. The report also discusses test results on a coaxial cable. The reported test duration exceeds the Salem accident duration but the reported peak temperature is 50° F below the peak temperature described by the Salem required profile.	a. This is covered by EQ. Report No. 27. That report covers three separate sets of testing. The first two sets were at a maximum temperature of 300°F. The third test was to the IEEE 323 LOCA profile which is to 340°F peak. The last test shows that there is not a change in state of the insulation which allows the use of the long term aging data in Figure 2. That data indicates that our required 1 minute hold at 350° is equivalent to approximately a 15 minutes hold at 300°F. The test peak of 300°F was held for 15 minutes in the first test and 240 minutes in the second test. Therefore, the tests temperatures meet or exceed the Salem requirements.	Qualified per PSE&G EQ Report No. 27. BIW Cable Co. Report B912, Nov., 1980

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44 (Cont'd)	Boston Insulated Wire BIWF Fluoropolymer		a. Report B913 is a summary report of information concerning Coaxial and Triaxial cable with BIWF Fluoropolymer insulation. The document refers to tests report in F-C3859-1 which are discussed on page 5h and 5i.	a. The cables in question are not insulated with BIWF Fluoropolymer.	
	Boston Insulated Wire All		a. Descriptions of cable constructions contained in the referenced test reports do not correspond to descriptions provided by the licensee on the SCEW sheets or in Analysis EQ-05.	a. IEEE 383 and IEEE 323 allow the use of representative samples in performing specific testing. The use of two conductor and seven conductor cable is considered representative of the cables at Salem according to IEEE 383.	
45	Electrical Cable, Triangle - Model not stated	Ia	None	None Required	Qualified
46	Electrical Cable - Anaconda Wire and Cable, EPR Insulation	Ia	None	None Required	Qualified
47	Electrical Cable, Rockbestos	IIa	a. Similarity b. Aging c. Qualified Life d. Testing	These cables are not used in safety-related circuits, therefore exempt.	Falls under Category IIIa
48	Electrical Cable, Okonite - Model not stated	Ia	None	None Required	Qualified
49	Motor Control Center, Power to Various Motor Operated Valves - General Electric Model 7700	IV	Documentation not made available	PSE&G considers this equipment to be qualified. Documentation has been classified as proprietary but is available for examination at our office.	Qualified per PSE&G EQ Report No. 14
50	Motor located in Containment, Drives Fan Cooler Motor - Westinghouse Spin No. PSE RCADCF	IIa	a. Qualification Documentation b. Similarity c. Qualified Life d. Aging Program e. Radiation Franklin Institute had 3 questions regarding the qualification of the motors:		FRC comments resolved and motors qualified

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50 (Cont'd)			<p>a. Lack of traceability of installed motor to the referenced test report.</p> <p>b. It was not stated whether the motor had an integral air-to-water heat exchanger.</p> <p>c. The motor insulation class and type were not stated.</p>	<p>a. Our Analysis of WCAP 8754 contained in PSE&G EQ-16 Report identified an anomaly concerning insulation thickness. Westinghouse answered our question via a letter dated March 24, 1981 contained in EQ-15 volume 2 Tab. 15.05. Westinghouse has used only thermolastic epoxy insulation in their nuclear motors. Therefore, these motors do have thermolastic epoxy stator insulation.</p> <p>b. The motors have integral air-to-water heat exchanger.</p> <p>c. Our analysis of WCAP 8754 contained in PSE&G EQ-16 Report identified an anomaly concerning insulation thickness. Westinghouse answered our question via a letter; motors do have thermolastic epoxy stator insulation.</p>	
51	Hydrogen Recombiner, Limits Combustible Gas Build-up Inside Containment - Westinghouse Model	IV	Documentation not made available.		Qualified per PSE&G EQ Report No. 50. Westinghouse Reports WCAP-7820 Sup. 6, Oct., 1976 and WCAP-9347 July, 1978
52	Electrical Connector, Connections of Electrical Cables at Equipment Terminal Blocks - Burndy Model HY LOG	IIC	<p>a. Aging</p> <p>b. Qualified Life</p> <p>c. Aging Simulation</p>		Qualified 40 years per PSE&G Report EQ-19. Wyle Lab. Report 17448-1
53	Thermocouple, Containment Air Temperature (TA 4312 thru 4321; TA 4348) - Tem Tex Model 304 250 TG 12, SA2 IH CC TC	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
54	Level Switch, Containment Sump Level - GEMS Model LS 800	Ib	a. Qualification Documentation		Qualified per PSE&G EQ Report No. 43. Wyle Lab. Report 45700-1, Dec. 8, 1982.
55	Thermocouple, Incore Temperature - Westinghouse Spin No. RCRIVI 583 FO14	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
56	Humidity Detector, Measures Humidity in Containment Foxboro Model 2F11AG	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49

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57	Radiation Monitor, Containment Radiation Detector High Range - Trapelo Model TA 63A	Ib	a. Qualification Documentation	Replaced with qualified Victoreen Model	Qualified per PSE&G EQ Report No. 41. Victoreen Qualification Report 950.30
58	Reed Switch, Rod Position Indication - Westinghouse Model KD 8805 12	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
59	Radiation Detector, Neutron Detection - Westinghouse Model SR WL23706 IR WL23707 PR WL23708	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
60	Electric Motor, Nozzle Support Cooling - Westinghouse Model TBFC	IIIa	None	Exempt - None Required	Not in the Scope of 10 CFR 50.49
61	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model NT 344A75	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
62	Hydrogen Analyzer, Combustible Gas Detector - Bacharach Model ND	Ib	a. Qualification Documentation	Replaced with a qualified model	Qualified per PSE&G EQ Report No. 38. ExoSensors Inc. Report EXO-QTR-101, Rev. 2, March, 1982
63	Limit Switch, Valve Position Indication NAMCO Model EA-170 11302	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch.	Qualified per PSE&G EQ Report No. 13. See also discussion for Item No. 36. Wyle Lab Report No. 17448-17, Dec. 2, 1980
64	Limit Switch, Position Indication for Valves - NAMCO Model D2400X	Ib	a. Qualification Documentation	Replaced with qualified NAMCO EA-180 Limit Switch	Qualified per PSE&G EQ Report No. 13. See also discussion for Item No. 36. Wyle Lab. Report No. 17448-17, Dec. 2, 1980
65	Pressure Transmitter, Boron Injection Tank, Safety Injection Pump Discharge Pressure - Fischer & Porter Model 50EP1041 AC	IIa	a. Similarity b. Aging c. Qualified Life d. T/P Exposure: Pressure e. Test Failures f. Instrument Accuracy	Will replace PA-0227, PA-7461, and PT-0942 with a qualified Rosemount 1153D Pressure Transmitter during present Unit 1 Refueling Outage	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
66	Differential Pressure Transmitter, Auxiliary Feedwater Flow - Fischer and Porter Model 10B2495	Ib	a. Similarity b. Aging c. Qualified Life d. Test Failures e. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
67	Square Root Extractor, Auxiliary Feedwater Flow - Fischer & Porter Model 50E53212	Ib	a. Qualification Documentation	Relocated to a mild environment during current Unit 1 Outage. Originally was located in the Inboard/Outboard Penetration Area	Relocated to Electrical Penetration area (Benign)
68	Differential Pressure Transmitter, RHR Pump Discharge Flow - Fischer & Porter Model 10B2496	Ib	a. Similarity b. Aging c. Qualified Life d. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
69	Pressure Transmitter, Steam Pressure Trip Input for Reactor Protection System - Rosemount Model 1153 AGA	Ib	a. Similarity b. Aging c. Qualified Life	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
70	Limit Switch, Position Indicator for Valves - NAMCO Model D2400X2	Ib	a. Qualification Documentation	Replaced with qualified NAMCO EA-180 Limit Switch	Qualified per PSE&G EQ Report No. 13. See also discussion for Item No. 36. Wyle Lab Report No. 17448-17, Dec. 2, 1980
71	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model LB831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Report No. AQR-67484, Rev. 0
72	Solenoid Valve, Pilot Valve Control for Purge Air Inlet Outside Isolation - ASCO Model HTX8344A75	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Report No. AQR-67484, Rev. 0
73	Solenoid Valve, Pilot Valve Control for Pressure - Vacuum Relief Damper - ASCO Model HTX834475	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
74	Solenoid Valve, Pilot Valve for Containment Isolation Valve ASCO Model X8342B22	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
75	Solenoid Valve, Pilot Valve Control for Purge Air Inlet Outside Isolation - ASCO Model HTX834477	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
76	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model HTB34477	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
77	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model HTB34475	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
78	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model LBX83146	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
79	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model FT8320A101	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
80	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model FT8321A2	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
81	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model 831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
82	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model X8342822	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves, except SV-621, SV-624, SV-627 and SV-630 which were deleted from the system	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
83	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model FT831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev.0
84	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model FT8314B6	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
85	Solenoid Valve, Pilot Valve ASCO Model FT831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No AQT-67484, Rev. 0
86	Limit Switch, Position Indication - Micro Switch Model LSQ051	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch	Qualified per PSE&G EQ Report No. 13. Wyle Lab Report No. 17448-17. See also discussion for Item No. 36.
87	Limit Switch, Position Indication for Valves - Masoneilan Model 496 2	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches, except VC5 and VC6 which used a qualified NAMCO EA-740 Limit Switch	Qualified per PSE&G EQ Report No. 13 and No. 46. See also discussion Item #36. EA-740 Limit Switches are qualified by manufacturer (Report QRT-111, dated Oct. 2,

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
88	Limit Switch, Position Indication - Micro Switch Model LSQ051	IIIa	a. None	Exempt - None Required	Not in the scope of 10 CFR 50.49
89	Pressure Transmitter, Accumulator Pressure - Fischer & Porter Model 5 OEP1031BCXA NS	Ib	a. Qualification Documentation b. Similarity c. Aging d. Qualified Life e. T/P Exposure: Duration Profile f. Test Failure g. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
90	Motorized Valve Actuator, Motive Power for Valve Opening/Closings Limitorque Model SMB, Class B Insulation	IIa	a. Qualification Documentation b. Aging c. Spray	Will be qualified or replaced during present outage with a qualified Motorized Valve Actuator	Qualified per PSE&G EQ Report No. 51. Limitorque Report B0003
91	Motorized Valve Actuator, Motive Power for Valve Openings/Closings - Limitorque Model SMB, Class H Insulation, Reliance Motor	IIa	a. Qualification Documentation b. Aging	Will be qualified or replaced during present outage with a qualified Motorized Valve Actuator	Qualified per PSE&G EQ Report No. 51. Limitorque Report B0C03
92	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model X8342822	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves, except SV-621, SV-624, SV-627 and SV-630 which were deleted from the system	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
93	Pressure Transmitter, Steam Flow Trip to Reactor Protection System - Rosemount Model - 1153AHA	Ib	a. Similarity b. Aging c. Qualified Life	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3.
94	Electrical Cable, Containment Rockbestos/Silicone	Ib	a. Similarity FRC stated that PSE&G did not identify cable with respect to: wire size, arrangement of conductors, fillers, binders, etc. & rated characteristics	The cable in the plant is a single conductor No. 2 on the Pressurizer Heater. It has a thicker Insulation than the test sample and the same insulation compound as stated in our Report EQ-07. IEEE 383 implies that a cable with thicker insulation than the tested cable is also qualified	FRC comments resolved and cables qualified per PSE&G EQ Report No. 07. Wyle Lab Report 17448-12 Nov. 12, 1980

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
1	RC Hot/Cold Leg Narrow Range Temperature - Rosemount Model 176KF RTD	IIa	a. Qualification Documentation b. Aging c. Qualified Life d. T/P Exposure: Profile e. Spray f. Testing g. Instrument Accuracy	Will be replaced during next outage with a qualified RTD. RDF Corp. Model 21204.	Qualified PSE&G EQ Report No. 45. WCAP-8687 - Supp 2-ED5A, Rev. 1, March, 1982.
2	RC Hot/Cold Leg Wide Range Temperature - Rosemount Model 176 KS RTD	IIa	a. Qualification Documentation b. Aging c. Qualified Life d. T/P Exposure: Profile e. Spray f. Testing g. Instrument Accuracy	Replaced with a qualified Model Conax P/N7A76-10000-01	Qualified per PSE&G EQ Report No. 40. Conax Report IPS-875, Oct. 15, 1982.
3	Solenoid Valve, Pilot for Containment Isolation Valve (SV0505) - ASCO Model LB8314B6	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves.	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484 Rev. 0
4	Limit Switch, Containment Isolation Valve Position Indication Micro Switch Model LSQ051	Ib	a. Qualification Documentation	Replaced all with NAMCO Model EA-180 Switches	Qualified per PSE&G EQ Report No. 13. Wyle Lab Report 17448-17, Dec. 2, 1980. See discussion Item No. 36
5	Pressure Transmitter, Pressurizer Pressure Trip Input to Reactor Protection System, Rosemount Model 1153AGA	Ib	a. Similarity b. Aging c. Qualified Life	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3.
6	Solenoid Valve, Air Supply Valve for Pressurizer PORV's - ASCO Model 821002	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
7	Limit Switch, Position Indication for Valves - NAMCO Model EA-180	Ia	None	None Required	Qualified
8	Differential Pressure Transmitter, Accumulator Level Indication - Barton Model 384	Ib	a. Qualification Documentation	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
9	Transducer, Control for Atmospheric Relief Valves MS10's - Fisher Governor Model 546	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
10	Pressure Transmitter, Steam Pressure Control for Atmospheric Relief Valves - Fischer Porter Model 50EP1041	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
11	Electric Motor, Cooling to Rod Drive Mechanisms - Westinghouse Model 77C27257	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
12	Limit Switch, Operator Indication & Valve Control Masoneilan Model 4962	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches	Qualified per PSE&G EQ Report No. 13. Wyle Lab. Report 17448-17. Discussion Item No. 36
13	Control Switch, Local Control of MS167 Hydraulic Pump - Micro Switch Model 910 PGD533	Ib	a. Qualification Documentation	Removed from the Control Circuitry	Local feature for Main Steam Stop Valve for easy maintenance. Removed from Control Circuitry.
14	Terminal Block, Electrical Connection - Cinch Jones Model	Ib	a. Qualification Documentation	Removed from the Control Circuitry	Local feature for Main Steam Stop Valve for easy maintenance. Removed from Control Circuitry.
15	Differential Pressure Transmitter, Auxiliary Feedwater Flow - Fischer and Porter Model 10B2495	Ib	a. Similarity b. Aging c. Qualified Life d. T/P Exposure: Duration Profile e. Test Failures f. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
16	Differential Pressure Transmitter, Monitors RHR Pump Discharge - Fischer & Porter Model 10B2495	Ib	a. Similarity b. Aging c. Qualified Life d. T/P Exposure: Duration Profile e. Test Failures f. Instrument Accuracy	Replaced all except FA-0218 Containment Spray Addition Tank Header, with qualified Rosemount 1153D Pressure Transmitters; will replace FA-0218 next outage with a qualified Rosemount 1153D Pressure Transmitter.	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
17	Flow Transmitter, Auxiliary Feedwater Flow - Fischer & Porter Model 50ES3212	Ib	a. Qualification Documentation	Relocated to a mild environment. Originally Controller was located in Inboard/Outboard Penetration area.	Relocated to Electrical Penetration area (Benign)
18	Pump Motor, Drives Charging/Safety Injection Pump - Westinghouse Model	IIa	a. Qualification Documentation b. Similarity Franklin Research concerns: a. Lack of traceability of installed motors to the reference test report. b. Lack of documented evidence for the qualification of the motor to lead splice	a. Our analysis of WCAP 8754 contained in PSE&G EQ-16 Report identified an anomaly concerning insulation thickness. Westinghouse answered our question via a letter dated March 24, 1981 contained in EQ-15 volume 2 Tab 1505. Westinghouse has used only thermolastic epoxy insulation in their nuclear motors. b. There are actually two splices per phase in the motor. One between the thermolastic epoxy and the interhal cable and a second at the lead box.	FRC comments resolved and motors are qualified per PSE&G EQ Report No. 16

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
18 (Cont'd)				<p>The first splice was supplied with the motor from Westinghouse. As stated on page 1-1 of WCAP8754, Environmental Qualification of Class IE Motors for Nuclear, Out-of-Containment Use, "...all large AC motors manufactured by Westinghouse for nuclear service employ the same insulation system and types of bearings, a generic qualification of these motors is possible." The splice material is actually qualified by WCAP 7829, Fan Cooler Motor Unit test, under component testing for Scotch 70 splice tape summarized in Table 22 on page 46. The second splice is made with Okonite splice kits.</p> <p>c. The insulation class was not stated.</p> <p>d. The installed grease (bearing) lubricant was not identified.</p> <p>c. As stated in 2A, only thermolastic epoxy insulation with thermal endurance as shown in Figure 4.1, page 4-2 of WCAP 8754 is used. The curve is equal to or greater than the requirement of Class F insulation.</p> <p>d. The appropriate lubricant is Westinghouse grease S#773A773G05 conforming to WCAP7498-L, Section 17.</p>	
19	Pump Motor, Post LOCA Decay Heat Removal - Westinghouse Model	IIa	See Franklin Research concerns #18	See Franklin Research concerns #18	FRC comments resolved and motors are qualified. See FRC #18
20	Transducer, Control for Valves 1RH20, 11RH18, 12RH18 - Fisher Controls Model 546	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
21	Flow Transmitter, RHR Pump Recir. - Barton Model 289A	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
22	Solenoid Valve, Pilot Valves for Main Steam Isolation Valves - ASCO Model RT3321A2	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Report No. AQR-67484 Rev. 0.
23	Level Transmitter, Containment Spray Additive Tank Level Indication - Barton Model 332/352	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
24	Electrical Connector, Rod Position Indication Wire Connectors - AMP Model 4806R147S, 4800R147P	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
25	Solenoid Valve, Control for Main Steam Isolation Valves - ASCO Model FT8321A4	Ib	a. Qualification Documentation b. Similarity	Replaced with qualified ASCO NP Series Solenoid Valve	Qualified per PSE&G EQ Report No. 44. ASCO Test Report 67484 Rev. 0
26	Limit Switch, Position Indication for Valves - NAMCO Model D2400XST	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches	Qualified per PSE&G EQ Report No. 13. Wyle Report 17448-17 Dec. 12, 1980. See discussion Item 36
27	Limit Switch, Position Indicator for Valves - Masoneilan Model 4962	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches	Qualified per PSE&G EQ Report No. 13. Wyle Lab Report 17448-17 Dec. 2, 1980. See discussion Item No. 36
28	Limit Switch, Position Indicator and Valve Control - NAMCO Model D2400x	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches	Qualified per PSE&G EQ Report No. 13. Wyle Lab Report No. 17448-17 Dec. 2, 1980. See discussion Item No. 36.
29	Square Root Extractor, Flow Pressure Control. Fischer & Porter Model 50ES3212	Ib	a. Qualification Documentation	Relocated to a mild environment. Originally located in Mechanical Penetration area	Relocated to Switchgear Room (Benign)
30	Flow Controller Fischer & Porter Model 53EG3000	Ib	a. Qualification Documentation	System redesigned; function is now performed by a mechanical device.	Modified from Electronic to Pneumatic Control
31	Transducer, Flow/Pressure Control - Fischer & Porter Model 53E13000	Ib	a. Qualification Documentation	Relocated to a mild environment.	Modified from Electronic to Pneumatic Control
32	Pressure Transmitter Barton Model 332 351	Ib	a. Qualification Documentation	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Transmitter qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
33	Pressure Bellows, Containment Pressure Trip function for Reactor Protection System - Barton Model 351	IIIb	None	None required	Not in Scope
34	Limit Switch, Position Indicator for valves - NAMCO Model D2400X	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switch	Qualified per PSE&G EQ Report No. 13. Wyle Lab. Report No. 17448-17 Dec. 2, 1980. See Discussion Item No. 36.
35	Solenoid Valve, Pilot Valve for Safety-Related Control Valves. ASCO Model NP Series	IIa	a. Submergence	PSE&G has stated that the valves have not been proven protected by IE Breakers. PSE&G has analyzed the potential loss of power (due to submergence) and this analysis has been reviewed and approved by the NRC (Reference in Salem FSAR response to Question 6.28)	FRC question resolved. Qualified per PSE&G EQ Report No. 44. ASCO Report AQR-67484 Rev. 0
36	Limit Switch, Valve Position Indicator NAMCO Model EA-180	IIa	a. Aging b. Qualified Life c. Spray		Qualified per PSE&G EQ Report No. 13. Wyle Lab Report 17448-17, Dec. 2, 1980

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
36 (Cont'd)			FRC had three questions regarding the qualification of NAMCO EA-180 Limit Switch:		
			a. The method used by Salem to seal the Limit Switches	a. Conax Connectors are used to seal the Limit Switches from the environment.	
			b. The concentration of chemical spray used in the test as compared to in the plant.	b. The test chemical spray was composed of boric acid, water sodium thiosulfate & sodium hydroxide at a ph between 10 & 11 with a coverage of .015 gallons/min./ft ² . The test was maintained for 4 days. Plant condition called for a ph greater than 8.5 for 22.5 hours.	
			c. The length of the qualified life of the Limit Switches.	c. Qualified life of over 40 years. Maintenance requirements: NAMCO Controls, Maintenance Instructions, PSE&G Field Directives to Stations	
37	Instrumentation and Control Panel, Enclosure for Instrumentation - PSE&G Model 1, 2, 3, 4, Bay, Vertical NEMA 12 Enclosures	IIIB	None	None Required	Outside the scope of 10 CFR 50.49
38	Motorized Valve Actuator, Motive Power for Valve Openings/Closings Limatorque Model SMB, Class B Insulation.	IIa	a. Qualification Documentation b. Aging	Will be qualified or replaced during next outage	
39	Terminal Block, Connection Point within PSE&G Terminal Box/Panels - Buchanan Model 2B112N	Ia	None	None Required	Qualified
40	Electrical Cable Splice, Termination/Junction of Electric Cable - Raychem Model WCSF N.	Ia	None	None Required	Qualified
41	Electrical Penetration - Conax Model Canister Type LVP MVP	Ia	None	None Required	Qualified
42	Electrical Cable, American Insulated Wire	IIC	a. Aging b. Qualified Life	PSE&G is reviewing the cable documentation with the intent of extending the life of the cable. Wyle Lab is in the process of testing the cable for extended life	
43	Electrical Cable, Samuel Moore, EPR (EPDM) Insulation	IIC	a. Aging b. Qualified Life		Qualified per PSE&G EQ Report No. 36 NTS Report 558-1088, Oct. 9, 1981.

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44	Electrical Cable, Boston Insulated Wire, Bostrad 7E Insulation Bostrad 7 ESPE Jacket	IIa	<p>a. Qualification Documentation b. Similarity c. T/P Exposure: Profile</p> <p>Franklin Institute had several questions concerning the several types of cable:</p> <p>a. PSE&G has not provided information either on the SCEW sheets or in analysis EQ-05 to establish that the installed cable constructions are the same as those constructions which successfully passes a test which envelopes the required Salem Parameters.</p> <p>b. The report also refers to F-C3859-1 for test results. Report F-C3859-1 is a report of testing conducted on various BIW cable constructions in accordance with IEEE 383-74 and IEEE 323-74. The cables tested and the results of the tests are reproduced on page 5i. The report indicates that some constructions successfully passed test while other cable constructions did not.</p>	<p>a. BIW has retested this product to expand and update their previous testing. Analysis of that report is contained in EQ Report No. 34. BIW letter dated May 24, 1982, indicates that all of the nuclear EPR insulation (Bostrad 7E) manufactured by BIW is of the same formulation. This connection is established by the QAF21 forms attached to all safety related orders. Therefore, the appropriate correlation has been established.</p> <p>b. The questionable cables reported on page 5i: are for multi-conductor flame retardant XLPE and single conductor #16EPR cable. The BIW part number indicates that the cables were laboratory test samples (LSS number vs a part number). The BIW report indicates, and verbal discussions with BIW have confirmed, that the compounds used in the questionable laboratory samples are not used in nuclear products.</p>	Qualified per PSE&G Report No. 34. BIW Cable Co. Report B915, Nov., 1980
	Boston Insulated Wire XLPE Coaxial Cable		<p>a. Report B912 (1705) is a test summary which discusses test results on Triaxial cable. The test profile does not envelope the Salem profile. The report also discusses test results on a coaxial cable. The reported test duration exceeds the Salem accident duration but the reported peak temperature is 50° F below the peak temperature described by the Salem required profile.</p>	<p>a. This is covered by EQ. Report No. 27. That report covers three separate sets of testing. The first two sets were at a maximum temperature of 300°F. The third test was to the IEEE 323 LOCA profile which is to 340°F peak. The last test shows that there is not a change in state of the insulation which allows the use of the long term aging data in Figure 2. That data indicates that our required 1 minute hold at 350° is equivalent to approximately a 15 minutes hold at 300°F. The test peak of 300°F was held for 15 minutes in the first test and 240 minutes in the second test. Therefore, the tests temperatures meet or exceed the Salem requirements.</p>	Qualified per PSE&G EQ Report No. 27. BIW Cable Co. Report B912, Nov., 1980.

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
44 (Cont'd)	Boston Insulated Wire BIWF Fluoropolymer		a. Report B913 is a summary report of information concerning Coaxial and Triaxial cable with BIWF Fluoropolymer insulation. The document refers to tests report in F-C3859-1 which are discussed on page 5h and 5i.	a. The cables in question are not insulated with BIWF Fluoropolymer.	
	Boston Insulated Wire All		b. Descriptions of cable constructions contained in the referenced test reports do not correspond to descriptions provided by the licensee on the SCEW sheets or in Analysis EQ-05.	a. IEEE 383 and IEEE 323 allow the use of representative samples in performing specific testing. The use of two conductor and seven conductor cable is considered representative of the cables at Salem according to IEEE 383.	
45	Electrical Cable - Triangle, Model not stated	Ib	None	None Required	Qualified
46	Electrical Cable - Anaconda Wire & Cable, EPR Insulation	Ia	None	None Required	Qualified
47	Electrical Cable, Rockbestos	IIa	a. Similarity b. Aging c. Qualified Life d. Testing	These cables are not used in safety-related circuits, therefore exempt.	Falls under Category IIIa.
48	Electrical Cable - Okonite, Model not stated	Ia	None	None Required	Qualified
49	Motor Control Center, Power to Various Motor Operated Valves - General Electric Model 7700	IV	Documentation not made available	PSE&G considers this equipment to be qualified. Documentation has been classified as proprietary but is available for examination at our office.	Qualified per PSE&G EQ Report No. 14.
50	Motor located in Containment, Drives Fan Cooler Motor - Westinghouse Spin No. PSE RCADCF	IIa	a. Qualification Documentation b. Similarity c. Qualified Life d. Aging Simulation e. Radiation Franklin Institute had 3 questions regarding the qualification of the motors:		FRC comments resolved and motors qualified

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
50 (Cont'd)			<p>a. Lack of traceability of installed motor to the referenced test report.</p> <p>b. It was not stated whether the motor had an integral air-to-water heat exchanger.</p> <p>c. The motor insulation class and type were not stated.</p>	<p>a. Our Analysis of WCAP 8754 contained in PSE&G EQ-16 Report identified an anomaly concerning insulation thickness. Westinghouse answered our question via a letter dated March 24, 1981 contained in EQ-15 volume 2 Tab 15.05. Westinghouse has used only thermolastic epoxy insulation in their nuclear motors. Therefore, these motors do thermolastic epoxy stator insulation.</p> <p>b. The motors have integral air-to-water heat exchanger.</p> <p>c. Our analysis of WCAP 8754 contained in PSE&G EQ-16 Report identified an anomaly concerning insulation thickness. Westinghouse answered our question via a letter motors do have thermolastic epoxy stator insulation.</p>	
51	Hydrogen Recombiner, Limit Combustible Gas Build-up Inside Containment - Westinghouse Model	IV	Documentation not made available		Qualified per PSE&G EQ Report No. 50. Westinghouse Reports WCAP 7820, Sup. 6, Oct., 1976, and WCAP 9347 July, 1978
52	Electrical Connector, Connections of Electrical Cables at Equipment Terminal Blocks - Burndy Model HY LUG	IIC	<p>a. Aging</p> <p>b. Qualified Life</p> <p>c. Aging Simulation</p>		Qualified per PSE&G Report EQ-19. Wyle Lab. Report 17448-1
53	Thermocouple, Containment Air Temperature - Tem Tex Model 304 250 TG 1/2 SA2 1H CC TC	IIIA	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
54	Level Switch, Containment Sump Level - GEMS Model LS 800	Ib	a. Qualification Documentation		Qualified per PSE&G EQ Report No. 43. Wyle Lab. Report 45700-1, Dec. 8, 1982.
55	Thermocouple, Incore Temperature - Westinghouse Spin No. RCRIUI 583 F014	IIIA	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
56	Humidity Detector, Measures Humidity in Containment - Foxboro Model 2711AG	IIIA	None	Exempt - None Required	Not in the scope of 10 CFR 50.49

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
57	Pressure Transmitter, Reactor Coolant System Pressure - Barton Model 763 Lot 1	Ib	a. Aging b. Qualified Life c. T/P Exposure Profile d. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
58	Reed Switch, Rod Position Indication - Westinghouse Model KD 8805 12	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
59	Radiation Detector, Neutron Detection - Westinghouse Model SR WL23706 IR WL23707 PR WL23708	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
60	Electric Motor, Nozzle Support Cooling - Westinghouse Model TBFC	IIIa	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
61	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model NT 344A75	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-6748, Rev. 0
62	Hydrogen Analyzer, Combustible Gas Detector - Bacharach Model	Ib	a. Qualification Documentation	Replaced with a qualified Exo Sensor Model.	Qualified per PSE&G EQ Report No. 38. Exo Sensors Inc. Report EXO-QTR-101, Rev. 2, March, 1982
63	Limit Switch, Valve Position Indication NAMCO Model EA-170 11302	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches.	Qualified per PSE&G EQ Report No. 13. Wyle Lab. Report 17448-17, Dec. 2, 1980. See discussion Item No. 36
64	Limit Switch, Operator Indication and Valves Control NAMCO Model D2400X	Ib	a. Qualification Documentation	Replaced with qualified NAMCO EA-180 Limit Switches	Qualified per PSE&G EQ Report No. 13. Wyle Lab Report 17448-17, Dec. 2, 1980. See also discussion for Item No. 36
65	Pressure Transmitter, Boron Injection Tank, Safety Injection Pump Discharge Pressure Fischer & Porter Model 5 OEP1041AC	IIa	a. Similarity b. Aging c. Qualified Life d. T/P Exposure Duration e. Test Failures f. Instrument Accuracy	Will replace PA-0227, PA-7461, and PT-0942 with a qualified Rosemount 1153D Pressure Transmitter during next Unit #2 Refueling Outage	Qualified per PSE&G EQ Report No.49. Wyle Lab. Report 45592-3
66	Differential Pressure Transmitter, Auxiliary Feedwater Flow - Fischer and Porter Model 10B2495	Ib	a. Similarity b. Aging c. Qualified Life d. Test Failures e. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure transmitters	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
67	Square Root Extractor, #135G Auxiliary Feedwater Flow Fischer & Porter Model 50E53212	Ib	a. Qualification Documentation	Originally located in the Inboard/Outboard Penetration area	Relocated to Electrical Penetration area (Benign)

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
87	Limit Switch, Position Indication for Valves - Masoneilan Model 496 2	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches, except VC5 and VC6 which used a qualified NAMCO EA-740 Limit Switch	Qualified per PSE&G EQ Report No. 13. See Discussion Item #36. NAMCO Model EA-740 Limit Switches are qualified by manufacturer (Report QRT-111, dated Oct. 2, 1980)
88	Limit Switch, Position Indication - Micro Switch Model LSQ051	IIIA	None	Exempt - None Required	Not in the scope of 10 CFR 50.49
89	Pressure Transmitter, Accumulator Pressure - Fischer & Porter Model 5 OEP1031BCXA NS	Ib	a. Qualification Documentation b. Similarity c. Aging d. Qualified Life e. T/P Exposure: Duration Profile f. Test Failures g. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure Transmitter	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
90	Motorized Valve Actuator, Motive Power for Valve Opening/Closings - Limitorque Model SMB, Class B Insulation, Reliance Motor	IIa	a. Qualification Documentation b. Aging c. Spray	Will be qualified or replaced during next refueling outage with a qualified Motorized Valve Actuator	
91	Motorized Valve Actuator, Motive Power for Valve Openings/Closings - Limitorque Model SMB, Class H Insulation, Reliance Motor	IIa	a. Qualification Documentation b. Aging	Will be qualified or replaced during next refueling outage with a qualified Motorized Valve Actuator	
92	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model X8342822	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves, except SV-621, SV-624, SV-627 and SV-630 which were deleted from the system	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
93	Pressure Transmitter, Steam Flow Trip Input to Reactor Protection System - Rosemount Model - 1153AHA	Ib	a. Similarity b. Aging c. Qualified Life	Replaced with qualified Rosemount Model 1153D Pressure Transmitters	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
94	Differential Pressure Transmitter, Steam Generator Narrow Range Water Level, Trip Input for Reactor Protection System - Barton Model 764 Lot 1	Ib	a. Aging b. Qualified Life c. T/P Exposure: Profile d. Instrument Accuracy	Replaced with qualified Rosemount 153D Pressure Transmitters	Qualified per PSE&G EQ Report No. 49. Wyle Lab Report 45592-3
95	Radiation Monitor, Containment High Range Radiation Monitor Model 111 977	Ib	a. Qualification Documentation	Replaced with Victoreen Model, which was qualified by manufacturer	Qualified per PSE&G EQ Report No. 41, Wyle Lab Report 45050-1, June 12, 1981

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
68	Differential Pressure Transmitter, RHR Pump Discharge Flow (FA1422, FA1423) - Fischer & Porter Model 1082496 AC	Ib	a. Similarity b. Aging c. Qualified Life d. Instrument Accuracy	Replaced with qualified Rosemount Model 1153D Pressure Transmitters	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
69	Pressure Transmitter, Steam Pressure Trip Input for Reactor Protection System - Rosemount Model 1153 AGA	Ib	a. Similarity b. Aging c. Qualified Life	Replaced with qualified Rosemount Model 1153D Pressure Transmitters	Qualified per PSE&G EQ Report No. 49. Wyle Lab. Report 45592-3
70	Limit Switch, Position Indicator for Valves - NAMCO Model D2400X2	Ib	a. Qualification Documentation	Replaced with qualified NAMCO EA-180 Limit Switches	Qualified per PSE&G EQ Report No. 13. Wyle Lab Report 17448-17, Dec. 2, 1980. See also discussion for Item No. 36
71	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model L8831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Report No. AQR-67484, Rev. 0
72	Solenoid Valve, Pilot Valve Control for Purge Air Inlet Outside Isolation - ASCO Model HTX8344A75	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Report No. AQR-67484, Rev. 0
73	Solenoid Valve, Pilot Valve Control for Pressure - Vacuum Relief Damper - ASCO Model HTX834475	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
74	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model X8342B22	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
75	Solenoid Valve, Pilot Valve Control for Purge Air Inlet Outside Isolation - ASCO Model HTX834477	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
76	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model HTB34477	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
77	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model HT834475	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0

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FRC #	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
78	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model LBX83146	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
79	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model FT8320A101	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
80	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model FT8321A2	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
81	Solenoid Valve, Pilot Valve for Containment Isolation Valve - ASCO Model 831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
82	Solenoid Valve, Valve Operation (SV1120 thru SV1124; SV1115 thru SV1119; SV-621, 0624, 0627, 0630, 0633) - ASCO Model X8342822	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves, except SV-621, SV-624, SV-627 and SV-630 which were deleted from the system	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
83	Solenoid Valve, Valve Operation (SV0688) - ASCO Model FT831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves.	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
84	Solenoid Valve, Valve Operation (SV0400, SV0423) - ASCO Model FT8314B6	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
85	Solenoid Valve, Valve Operation (SV0117, 118, 119; SV164) - ASCO Model FT831654	Ib	a. Qualification Documentation	Replaced with qualified ASCO NP Series Solenoid Valves	Qualified per PSE&G EQ Report No. 44. ASCO Test Report No. AQR-67484, Rev. 0
86	Limit Switch, Position Indication - Micro Switch Model LSQ051	Ib	a. Qualification Documentation	Replaced with qualified NAMCO Model EA-180 Limit Switches	Qualified per PSE&G EQ Report No. 13 Wyle Lab Report 17448-17, Dec. 2, 1980. See discussion for Item No. 36

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	DESCRIPTION	CATEGORY	QUALIFICATION DEFICIENCIES	RESOLUTION	STATUS
96	Radiation Monitor, Containment High Range Radiation Monitor Victoreen Models: M865T, M866I, M862S, FU, COM808B	Ib	a. Qualification Documentation	Replaced with Victoreen Model, which was qualified by manufacturer	Qualified per PSE&G EQ Report No. 41. Wyle Lab Report 45050-1, June 12, 1981
97	Electrical Cable - Rockbestos/Silicone	IIa	a. Similarity FRC stated that PSE&G did not identify cable with respect to: wire size, arrangement of conductors, fillers, binders, etc. & rated characteristics	The cable in the plant is a single conductor No. 2 on the pressurizer heater. It has a thicker insulation than the test sample and the same insulation compound as stated in our Report EQ-07. IEEE 383 implies that a cable with thicker insulation than the tested cable is also qualified	FRC comments resolved. Cables qualified per PSE&G EQ Report No. 07. Wyle Lab Report 17448-12. Nov. 12, 1980

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ENCLOSURE 2

RESOLUTION OF NRC IDENTIFIED

GENERIC ISSUES

CONTAINMENT FLOOD EVALUATION METHODOLOGY

1. In performing the Containment Flood Analysis the initial assumption was that water will short-circuit the wiring within an electrical component, causing the circuit's protective device to open and thereby render the component and all other components powered by the same circuit inoperative.
2. The specific flood level at which a component was considered to become inoperable is specified as follows:
 - a. Solenoid valves - bottom of solenoid coil,
 - b. Motor operated valves - bottom of motor housing,
 - c. Pneumatic operated valves - bottom of stem mounted limit switch,
 - d. Instruments - bottom of their electrical enclosure
 - e. Circuits in junction boxes - centerline of junction box or any part thereof
3. Based on the above specified inoperable levels, a drawing search was performed to determine all electrical components located below the postulated flood level. Subsequently, a site survey was performed to verify the installed elevations of all electrical components located below the postulated flood level.
4. A listing was developed by circuit number of all submerged electrical components in containment and associated electrical components powered by the same circuit but not submerged. The safety functions of each component rendered inoperable by the postulated flood was then established.
5. A Failure Mode and Effects Analysis was performed to determine if loss of power to a device would prevent it from performing its safety function. As a result of the analysis, any component that was determined not to be able to perform its safety function was moved out of the influence of the postulated containment flood.

Chemical Spray

The effects of caustic spray have been addressed in the equipment qualification program. The UFSAR value for the chemical concentration of the containment spray system is 0.2 wt.% solution caustic and 1.2 wt. % boric acid, resulting in a pH greater than 8.5. The environmental qualification

CONTAINMENT FLOOD EVALUATION METHODOLOGY
(Continued)

review of the acceptability of the chemical spray testing of equipment was based upon the use of boric acid and sodium hydroxide (or equivalent) in a solution creating a pH of greater than 8.5 for a duration longer than 22.5 hours.

The concentration of caustics used for the equipment qualification testing is equivalent to or more severe than those used in the Salem plant containment spray system, thereby satisfying the requirement of NUREG 0588. In all applicable equipment qualification reports, the combination of caustic and acidic solutions resulted in a pH of greater than the design value of 8.5 for Salem.

ENCLOSURE 3

METHODOLOGY TO IDENTIFY NON SAFETY RELATED

EQUIPMENT WITHIN THE SCOPE OF

10 CFR 50.49 (b) (2)

SALEM GENERATING STATION, UNITS 1 AND 2

METHODOLOGY TO IDENTIFY NONSAFETY-RELATED
EQUIPMENT WITHIN THE SCOPE OF
10 CFR 50.49 (b) (2)
SALEM GENERATING STATION, UNITS 1 AND 2

Paragraph (b) (2) of 10 CFR 50.49 requires that licensees identify "Nonsafety-related electric equipment whose failure under postulated environmental conditions could prevent satisfactory accomplishment of safety functions..." The methodology that was used to identify such equipment is summarized below:

1. A list was generated of safety-related electric equipment as defined in paragraph (b) (1) of 10 CFR 50.49 required to remain functional during or following design-basis Loss of Coolant Accident (LOCA) or High Energy Line Break (HELB) Accidents. The LOCA/HELB accidents are the only design-basis accidents which result in significantly adverse environments to electrical equipment which is required for safe shutdown or accident mitigation. The list was based on reviews of the Salem Generating Station Updated Final Safety Analysis Report (UFSAR), Technical Specifications, Emergency Operating Procedures, Piping and Instrumentation Diagrams (P&IDs), and electrical distribution diagrams;
2. The elementary wiring diagrams of the safety-related electrical equipment identified in Step 1 were reviewed to identify any auxiliary devices electrically connected directly into the control or power circuitry of the safety-related equipment (e.g., automatic trips) whose failure due to postulated environmental conditions could prevent the required operation of the safety-related equipment; and
3. The operation of the safety-related systems and equipment were reviewed to identify any directly mechanically connected auxiliary systems with electrical components which are necessary for the required operation of the safety-related equipment (e.g., cooling water or lubricating systems). This involved the review of P&IDs, component technical manuals, and/or systems descriptions in the UFSAR.
4. Nonsafety-related electrical circuits indirectly associated with the electrical equipment identified in Step 1 by common power supply or physical proximity were considered by a review of the original Salem Generating Station electrical design including the use of applicable industry standards and the use of properly coordinated protective relays, circuit breakers, and fuses for electrical circuit fault protection.

METHODOLOGY TO IDENTIFY NONSAFETY-RELATED
EQUIPMENT WITHIN THE SCOPE OF
10 CFR 50.49 (b) (2)
SALEM GENERATING STATION, UNITS 1 AND 2
(Continued)

The systems and equipment generated in Steps 2, 3 or 4 above were then compared to the "Master List of Electrical Equipment". The results of the above review indicated that no additional electrical equipment was identified which was not previously included in the Master List. Therefore, the list of electrical equipment provided in Enclosure 1 to this letter is judged to address all electrical equipment within the scope of paragraph (b) (2) of 10 CFR 50.49.