

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1) Salem Generating Station - Unit 2	DOCKET NUMBER (2) 0 5 0 0 0 3 1 1	PAGE (3) 1 OF 1 2
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TITLE (4)
Appendix R Criteria Non-Conformance

EVENT DATE (6)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)									
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)							
0	9	1	7	8	7	0	0	9	0	5	1	0	1	6	8	7	Salem - Unit 1	0 5 0 0 0 2 7 2
												0 5 0 0 0						

OPERATING MODE (8) N/A	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)														
POWER LEVEL (10) N/A	20.402(b)	20.405(a)(1)(i)	20.405(a)(1)(ii)	20.405(a)(1)(iii)	20.405(a)(1)(iv)	20.405(a)(1)(v)	50.73(a)(2)(iv)	50.73(a)(2)(v)	50.73(a)(2)(vi)	50.73(a)(2)(viii)(A)	50.73(a)(2)(viii)(B)	50.73(a)(2)(ix)	73.71(b)	73.71(c)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
							X								

LICENSEE CONTACT FOR THIS LER (12)

NAME M. K. Gray - Licensing Engineer	TELEPHONE NUMBER AREA CODE: 6 0 9 3 3 9 - 4 3 7 0
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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRPDS

SUPPLEMENTAL REPORT EXPECTED (14)

YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO	EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
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ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

The following system/component conditions were identified by a PSE&G task force reviewing/evaluating Salem Station's compliance with the requirements of 10CFR 50 Appendix R. Where appropriate, fire watches were established. Long term corrective action includes making design change modifications, as applicable.

LER 87-009-00 addressed a SW System cabling Appendix R separation criteria inadequacy. The root cause was inadequate design review. LER 87-009-01 addressed non-seismically qualified Marinite walls located in Salem Units 1 & 2 460V Switchgear Room. The walls have been reinforced to seismic criteria. A sample of design changes installed before implementation of current design control procedures is being conducted. LER 87-009-02 addresses RHR Room Coolers {VF} cabling Appendix R inadequacies and control cabling Appendix R inadequacies for RHR Room Coolers, Charging Pump Room Coolers {VF} and Diesel Generator Fuel Oil Transfer Pumps {DC}. The root cause of these inadequacies is inadequate design review. LER 87-009-03 addressed a D/G power cabling Appendix R separation criteria deficiency. The root cause was inadequate design review. LER 87-009-04 addressed cabling deficiencies located in both Units CO₂ Equipment Rooms, identified on 9/10/87. The root cause was inadequate design review.

This Supplement addresses two (2) issues: UHF Communication concerns (both Units) during a postulated fire and the declared inoperability of all three D/G's {EK} (both Units) upon postulated acutation of the Low Pressure CO₂ Flooding System. The root cause of both concerns was inadequate design review. Design change modifications will be made to correct these deficiencies.

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PLANT AND SYSTEM IDENTIFICATION:

Westinghouse - Pressurized Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as {xx}

IDENTIFICATION OF OCCURRENCE:

Appendix R Criteria Non-Conformance

Discovery Date(s): 09/17/87 and 9/22/87

Report Date: 10/16/87

This report was initiated by Incident Report Nos. 87-241, 87-256, 87-278, 87-279, 87-301, 87-343, 87-352, & 87-354

CONDITIONS PRIOR TO OCCURRENCE:

N/A

DESCRIPTION OF OCCURRENCE:

The following plant system/component conditions were identified by a Public Service Electric & Gas (PSE&G) task force established to review and evaluate Salem Station's compliance with the requirements of 10CFR 50 Appendix R. The original LER (paragraphs designated "A") dealt with a design configuration problem associated with Salem Unit 2's Service Water System electrical cabling. The first supplement (paragraphs designated "B") addresses a wall constructed to act as a fire barrier but its design did not fully address seismic criteria concerns. The second supplement addresses Residual Heat Removal (RHR) Room Coolers {VF} cabling concerns (paragraphs designated "C") and control cabling concerns for RHR Room Coolers, Charging Pump Room Coolers {VF} and Diesel Generator (D/G) Fuel Oil Transfer Pumps {DC} (paragraphs designated "D"). The third supplement addressed inadequate separation of D/G power cabling (paragraphs designated "E"). The fourth supplement addressed inadequate separation of cabling located in the CO₂ Equipment Room (paragraphs designated "F"). This supplement addresses two (2) separate issues: UHF Communication concerns (both Units) during a postulated fire which causes a Control Room evacuation and the declared inoperability of all three D/G's (both Units) upon actuation of the Low Pressure CO₂ Flooding System (paragraphs designated "G" and "H" respectively).

On June 19, 1987 at 1515 hours, it was discovered that the cabling for the three (3) electrical trains of the Unit 2 Service Water (SW) System {BI} did not meet the separation requirements of the Code of Federal Regulations, 10CFR 50 Appendix R. These cables are located in the SW Pipe Tunnel located between the Auxiliary Building and the "A" SW Intake Structure. Upon discovery, a continuous fire watch was established at the entrance to the SW Pipe Tunnel. The fire watch periodically walks down the length of the tunnel. This discovery was

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DESCRIPTION OF OCCURRENCE: (cont'd)

reported to the Nuclear Regulatory Commission by telephone on June 19, 1987 at 1530 hours in accordance with the requirements of 10CFR 50.72(b)(2)(iii)(D).

"B" On June 25, 1987 it was discovered that a Marinite wall located in the Salem Unit 1 460V Switchgear Room (84' Elevation) was not seismically qualified. If a seismic event occurred a possibility existed that the wall could have failed causing damage to the 460V Vital Bus Switchgear. This wall configuration also existed for Salem Unit 2.

"C" On July 17, 1987 at 1600 hours, it was identified that the cabling for redundant trains of Unit 2 RHR Room Coolers do not meet the requirements of 10CFR 50 Appendix R, Subsection III(G). These cables are located in a common panel in the Reactor Plant Auxiliary Equipment Area, Elevation 64 (Fire Area 2FA-AB-64B). A postulated fire in this area could damage these cables resulting in the loss of both RHR Room Coolers. In addition, damage to these cables could prevent the RHR Room Ventilation Supply and Exhaust Dampers [VF] from opening. This discovery was reported to the Nuclear Regulatory Commission on July 17, 1987 at 1615 hours pursuant to 10CFR 50.72(b)(2)(iii)(B).

"D" On July 17, 1987 at 1600 hours, it was identified that the cabling located in the Unit 2 Upper Electrical Penetration Area, Elevation 100', (Fire Area 2FA-EP-100G) does not meet the separation requirements of 10CFR 50 Appendix R. These cables run from the Safeguards Equipment Cabinets (SECs) to the Vital Ventilation Control Centers. If a postulated fire occurred in the Upper Electrical Penetration Area, the possibility exists to damage control cabling for both RHR Room Coolers, both Charging Pump Room Coolers, and one (1) D/G Fuel Oil Transfer Pump. This equipment is necessary to achieve and maintain a safe shutdown of the plant. This discovery was reported to the Nuclear Regulatory Commission on July 17, 1987 at 1615 hours pursuant to 10CFR 50.72(b)(2)(iii)(A).

"E" On August 6, 1987 at 1600 hours, it was identified that the power cabling for the "B" and "C" D/G's of both Salem Unit 1 and Unit 2 do not meet the separation criteria of 10 CFR50 Appendix R Subsection III(G). These cables are located in the Diesel Fuel Oil Storage Room at elevation 84' (Fire Area 1(2) FA-AB-84D). A postulated fire in this area damaging these cables could result in the loss of both "B" and "C" D/G's.

"F" On September 10, 1987 at 1500 hours, the cabling located in both Salem Unit 1 and Unit 2 CO₂ Equipment Rooms (Fire Areas 1(2)FA-DG-84F) was identified to not meet 10 CFR50 Appendix R Subsection III(G). This cabling includes the neutral ground strap and power cables for the "A" D/G, "B" and "C" SW Pump power feeds, power cabling for the "A" and "B" D/G Fuel Oil Transfer Pumps, and the cabling for various "A" and "C" Train SW components.

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DESCRIPTION OF OCCURRENCE: (cont'd)

"F" If a postulated fire occurred in a CO₂ Equipment Room, the potential exists to damage these cables, resulting in the loss of the applicable Unit's "A" D/G, "B" and "C" SW Pumps, D/G Fuel Oil Transfer Pumps, various Service Water valves, and portions of the SW HVAC system. This equipment is necessary to achieve and maintain post-fire safe shutdown of the plant.

"G" On September 17, 1987 at approximately 1800 hours, it was discovered that the location of the power supply for the UHF Communication System in Salem Units 1 and 2 did not meet the requirements of 10CFR 50 Appendix R. This system provides for radio communication between personnel located at the Hot Shutdown Panel and operators working throughout the plant. This system assists plant operators to bring the plant to Hot Shutdown in a timely manner in the event of a fire which results in the evacuation of the Control Room. However, the UHF Communication System power supply is located in the Relay Room (Fire Area 1(2)FA-AB-100A). A postulated fire in this area could result in Control Room evacuation due to the loss of control and monitoring capability. Plant operators may therefore not be able to communicate via the UHF Communication System to bring the plant to Hot Shutdown outside the Control Room.

"H" On September 22, 1987 at 1545 hours, it was discovered that a postulated fire damaging control cabling and/or electrical panels associated with the Low Pressure Carbon Dioxide Flooding System (CO₂ Flooding System) could result in CO₂ flooding of the three (3) D/G areas. Current procedures would then require all three D/G's to be declared inoperable. This condition could adversely impact the ability of the plant to safely shutdown in the event of Loss of Offsite Power (LOP) concurrent with a fire. After a re-evaluation, this discovery was reported to the NRC on September 23, 1987 at 1705 hours pursuant to the requirements of 10CFR 50.72(b)(2)(iii)(A). This identical concern exists for Salem Unit 1 also.

APPARENT CAUSE OF OCCURRENCE:

"A" The root cause of the SW cabling configuration deficiency is inadequate design review. The current design meets the original electrical separation requirements for Salem Station Unit 2, however, it does not meet the 10CFR 50 Appendix R requirements as published in the Federal Register on September 8, 1981. The Appendix R criteria was not applied to the SW Piping Tunnel because of its restricted access and confined space. Due to this oversight, the SW Pump cabling configuration was not modified.

"A" 10CFR 50 Appendix R, Section G(2) requires cables and equipment of redundant trains of systems necessary to achieve and maintain hot shutdown be protected by one of three (3) options to ensure that one redundant train is free from fire damage. The three (3) options are: (1) separation of cables and equipment of redundant trains by a three (3) hour fire barrier; (2) separation of cables and equipment of

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APPARENT CAUSE OF OCCURRENCE: (cont'd)

redundant trains by a horizontal distance of more than twenty (20) feet with no intervening combustible or fire hazards along with fire detection and an automatic fire suppression system in the area; or

"A" (3) enclosure of cables and equipment of one redundant train in a one hour rated fire barrier along with fire detectors and an automatic fire suppression system in the area. The current design does not meet any of these options.

The root cause of the Marinite wall seismic qualification concern is inadequate design review and documentation. The Marinite walls were installed in January 1981 to provide a fire barrier between redundant safety related components. Although the recent walkdown of the walls, by structural engineers, revealed the walls to have

"B" substantial structural support, it was not clear whether seismic requirements were fully considered in the original design and construction of the walls since documentation of the construction appeared inadequate. Subsequent engineering evaluation of the wall(s) revealed that two of the walls (one per Unit) did not meet seismic requirements since their failure could degrade safety-related equipment.

The root cause of the RHR Room Cooler cabling deficiency was inadequate design review. The current cabling configuration meets the original plant design criteria in effect prior to the issuance of

"C" 10 CFR50 Appendix R. The cabling configuration was not included in the fire protection upgrade made pursuant to the issuance of 10 CFR50 Appendix R in September 1981.

10 CFR50 Appendix R, Subsection III(G) requires fire protection features be provided for systems important to safe shutdown. These features should be able to limit fire damage so systems necessary to achieve and maintain cold shutdown can be repaired within 72 hours. The subject cables are located in Auxiliary Building HVAC Electrical Panel 119 in Fire Area 2FA-AB-64B. A fire in this area could cause both RHR Room Coolers to become inoperable and concurrently keep the

"C" RHR Room HVAC dampers in the closed position. This would degrade the performance of the RHR Pumps, which are necessary to achieve cold shutdown. To meet these Appendix R requirements, it would be necessary to either: (1) separate the cables with appropriate fire barriers, (2) have Alternate Shutdown Instructions and dedicated materials to ensure that repairs are made within 72 hours of the fire, or (3) obtain NRC approval for an Appendix R exemption in this area. None of these requirements are currently met.

The root cause of the control cabling deficiency for Fire Area 2FA-EP-100G is inadequate design review. The current cabling configuration meets the original plant design criteria in effect

"D" prior to the issuance of 10 CFR50 Appendix R. The cabling configuration was not included in the fire protection upgrade made pursuant to the issuance of 10 CFR50 Appendix R. 10CFR 50 Appendix R, Subsection III(G) identifies acceptable cable separation and fire

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APPARENT CAUSE OF OCCURRENCE: (cont'd)

barrier options that ensure one train of systems, necessary to achieve and maintain hot shutdown, remain free from fire damage during a postulated fire. The current cable design does not incorporate any of these options.

"E" The root cause of the D/G cabling deficiency is inadequate design review. The cabling configuration was not included in the fire protection upgrade made pursuant to the issuance of 10CFR 50 Appendix R. Subsection III(G) of Appendix R identifies acceptable cable separation and fire barrier options that ensure one redundant train of systems necessary to achieve and maintain hot shutdown remains free from fire damage during a postulated fire. The current cable configuration does not completely incorporate any of these options.

"F" The root cause of the CO₂ Equipment Room cabling deficiencies is inadequate design review. The cabling configuration was not included in the fire protection upgrade made pursuant to the issuance of 10CFR 50 Appendix R. Subsection III(G) of Appendix R identifies acceptable cable separation and fire barrier options that ensure one redundant train of systems necessary to achieve and maintain hot shutdown remains free from fire damage during a postulated fire. The current cable configuration does not completely incorporate any of these options because (1) the cables are not protected by rated fire barriers, and (2) the area is not equipped with detection or automatic suppression fire equipment.

"G" The root cause of the UHF Communication System design deficiency is inadequate design. Although the design was identified as "immune to the effects of an exposure fire in the Relay Room" in the Safety Evaluation Report Supplement 6 dated May 1981, it was determined to be unacceptable during the recent NRC Appendix R Fire Protection Audit. 10CFR 50 Appendix R requires if the levels of equipment and cable separation specified in Subsection III G(2) cannot be met, alternative and dedicated shutdown capability must be established. Since the Salem Control Room design does not meet these separation requirements, an Alternate Shutdown procedure (AOP-FIRE-1/2) was established in accordance with 10CFR 50 Appendix R Subsection III(L). The UHF Communication System is necessary to perform this procedure in a timely manner. However, its power supply could become inoperable due to a postulated fire in the Relay Room and subsequent evacuation of the Control Room.

"H" The root cause of the CO₂ Flooding System susceptibility to a single failure causing an inadvertent discharge to all three D/G areas with ventilation isolation is inadequate design review. A previous PSE&G safety evaluation for an unrelated single failure concern recommended that a D/G be declared inoperable if a fire and subsequent CO₂ actuation occurred in the subject D/G room. Two out of three D/G's are required to safely shut down the plant in the event of a LOP. This recommendation impacted the design of the CO₂ Flooding System in that no single failure of the system could be

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APPARENT CAUSE OF OCCURRENCE: (cont'd)

tolerated which would result in spurious dumping of CO₂ into more than one D/G room.

ANALYSIS OF OCCURRENCE:

The SW System supplies cooling water to both safety related and non-safety related heat loads. The system utilizes six (6) pumps. The 4.16 KV Vital Busses (trains A, B, and C) provide power to two (2) SW Pumps per bus. The cabling for these trains runs through the "A" SW Pipe Tunnel to the SW Intake Structure. These cables do not meet Nuclear Regulatory Commission 10CFR 50 Appendix R separation criteria (for Fire Protection). If a fire were to occur in this area a possibility exists of damaging all SW Pump electrical trains, thereby fosing all SW flow. The Unit could be maintained in Hot Standby (Mode 3), which is a subcritical mode.

While SW Pump Cabling does not meet 10CFR 50 Appendix R separation criteria for fire protection, it does meet the separation criteria to which Unit 2 was originally licensed. The cabling is separated by a horizontal distance of approximately five (5) feet. Also, there is an unrated partial wall between two of the three SW Pump cables. The "A" combustible loading in the area is only approximately six (6) minutes of burn time. Also, access to the SW Pipe Tunnel is restricted, thereby limiting the possibility of adding uncontrolled combustible material to the area. Therefore, it is unlikely a fire would occur that could impair all SW Pump cabling.

The inadequate separation of the SW cabling discovery was reported in accordance with 10CFR 50.72(b)(2)(iii)(D) within four (4) hours of "A" discovery (at 1530 hours). Also, this discovery was reported in accordance with Nuclear Regulatory Commission 10CFR 50.73(a)(2)(v)(D) via Licensee Event Report 311/87-009-00.

The Marinite walls are located in the Units 1 & 2 460V Switchgear Rooms on 84' Elevation. The 1B(2B) 460V Vital Bus Panel parallels the Marinite wall(s) with an intervening distance of approximately four (4) feet. The eight (8) foot high walls consist of two 4' panels. During a seismic event, it is possible for the upper panel to fail, damaging the 1B(2B) 460V Vital Bus Switchgear. The "B" Switchgear supplies power to a variety of safety related equipment including Nos. 12(22) & 14(24) Containment Fan Coil Units (CFCU's), No. 12 Hydrogen Recombiner, and the No. 12 Auxiliary Building Ventilation Supply and Exhaust Fans. This equipment would become inoperable if 1B(2B) Vital Bus was rendered inoperable during a seismic event. Nos. 13(23) and 15(25) CFCU's receive power via No. 1C(2C) electrical train. Additionally, 1C(2C) electrical train supplies power to one Containment Spray (CS) Pump. The limiting case involves the postulated seismic event resulting in the loss of 1B(2B) 460V Vital Bus Switchgear concurrent with a single "active failure" of the 1C(2C) electrical train. This would result in only one (1) operable CFCU and one (1) operable CS Pump. During a design base

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ANALYSIS OF OCCURRENCE: (cont'd)

LOCA, the minimum combination of three (3) CFCU's and one (1) CS Pump is necessary to maintain post-accident Containment pressure below design values. This requirement would not be met if the above scenario is assumed. However, this analysis is based upon the conservative assumption that the Marinite wall failure during a seismic event would result in the complete loss of the 1B(2B) 460V Vital Bus Switchgear. The steel cabinet housing this bus provides a significant degree of protection for the Bus. Furthermore, it is possible the damage to this Bus would not necessarily result in the loss of power to all components powered from this Bus.

"B" Due to the low probability of the combination of events occurring consistent with the conservative assumption made above, the Marinite wall seismic concern did not adversely impact the health and safety of the general public. However, it is being reported in accordance with 10CFR 50.73(a)(2)(vi) as a design inadequacy.

"C" The Auxiliary Building HVAC Electrical Panel 119 contains solenoid valves SV-784 and SV-785 and associated cabling controlling the operation of Nos. 21 and 22 RHR Room Coolers. These solenoid valves are de-energized when either RHR Pump is required to run. RHR Pump Room HVAC dampers 2ABV27 and 2ABV28 fail open when the solenoid valves are de-energized, thereby ensuring circulation of building ventilation air in the room when either RHR Pump is operating. If a fire occurred in this area, it is possible to hot short the cabling to both RHR Room Coolers and blow the control fuses in the RHR Room Cooler control circuit. This would result in the loss of both RHR Room Coolers. The potential further exists for the solenoid valves to remain energized while the RHR Pumps are running, causing dampers 2ABV27 and 2ABV28 to remain closed thereby preventing circulation of ventilation air to the room. Procedurally, operators are instructed to declare the equipment in the RHR Rooms inoperable if the ambient temperature exceeds 125°F. These limits could be exceeded in a short time given the above scenario. Furthermore, without "Alternate Shutdown Instructions" and dedicated material on hand, it cannot be assumed that the coolers could be repaired within 72 hours after the postulated fire.

"D" During accident conditions coincident with a Loss of Offsite Power or 4KV Bus undervoltage signal, the SECs start and connect the Diesel Generators (D/Gs) to the vital buses and sequentially start required safeguards equipment. During the automatic SEC loading sequence, safeguards equipment not required in the short term is blocked from automatically operating to avoid overloading the D/Gs. Upon completion of the automatic loading sequence, the plant operator resets the SECs allowing control of additional equipment needed to assist in the safe shutdown of the plant in the long term. This equipment includes the RHR Room Coolers, the Charging Pump Room Coolers, and the D/G Fuel Oil Transfer Pumps. This equipment receives signals from the SECs via cables 2RP65-AT, 2RP129-BT, and 2RP148-CT which run from 2A, 2B, and 2C SECs to 2A, 2B, and 2C

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ANALYSIS OF OCCURRENCE: (cont'd)

Ventilation Control Centers in Fire Area 2FA-EP-100G. A fire occurring in the Upper Electrical Penetration Area could damage these cables thereby creating the possibility of not powering up this equipment when called upon. The RHR and Charging Pump Room Coolers ensure the ambient room temperature does not exceed RHR Pump or Charging Pump design limits, however, Auxiliary Building ventilation air would still be available to limit ambient temperature. The D/G Fuel Oil Transfer Pumps transfer oil from the D/G Storage Tanks to the D/G Day Tanks. Due to the recent modification to the electrical controls for the D/G Fuel Oil Transfer Pumps described in Unit 1 LER 272/87-010-00, only one D/G Fuel Oil Transfer Pump would be locked out during the SEC manual loading sequence.

The 4KV power cabling for the D/G's is located in the D/G Fuel Oil Storage Room. Each D/G has two (2) power cables enclosed in conduit. The D/G "B" and "C" cables BDD-B and CDD-C run from the exciter cubicle to the 4KV Vital Bus switchgear and cables BDDA-B and CDDA-C run from the D/G to the exciter cubicle. Only the "B" D/G cable BDD-B is protected with a one hour fire wrap. Approximately 23 feet separate the B and C sets of D/G power cables. Thermal type fire detectors provide fire detection capability. The CO₂ flooding "E" system and water deluge system provide diverse and redundant automatic suppression capabilities. This configuration does not meet any of the three (3) 10CFR 50 Appendix R G(2) options (listed in paragraph "A" of this section). Option 1 is not met because of the cabling for D/G's "B" and "C" is not separated by a three (3) hour fire barrier. Option 2 is not met because while the D/G "B" and "C" cabling is separated by more than 20 feet, the D/G Fuel Oil Storage Tank is an intervening combustible. Option 3 is not met because cable BDDA-B is not protected with a one hour rated fire barrier.

A postulated fire occurring in the D/G Fuel Oil Storage Room could render D/G's "B" and "C" inoperable. Two out of the three D/G's are required to achieve and maintain safe shutdown during a postulated "E" fire in this area coincident with a loss of off-site power. During these conditions, only D/G "A" would remain operable. Therefore, this condition is being reported as a design inadequacy pursuant to 10CFR 50.73(a)(2)(vi).

If a fire occurred in the CO₂ Equipment Room resulting in damage to the subject cabling, the potential exists to degrade or prevent the operation of the "A" D/G, "A" and "B" D/G Fuel Oil Transfer Pumps, "B" Train and "C" Train SW Pumps, various SW valves, and portions of the SW HVAC system. To achieve safe shutdown, two (2) out of three "F" (3) SW trains are required, as is one D/G Fuel Oil Transfer Pump. These requirements may not be met if the above postulated fire scenario occurred. The impact of the loss of various SW valves and portions of the SW HVAC system would be to potentially degrade the function of the SW system thus preventing timely completion of a safe shutdown.

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ANALYSIS OF OCCURRENCE: (cont'd)

A postulated fire in the CO₂ Equipment Room in conjunction with a LOP would require the operation of the D/G's. The "A" D/G provides "F" power to the "A" SW Pumps. Since "B" and "C" SW power feed cables are also located in the CO₂ Equipment Room, the operation of all three SW trains could be affected by the postulated fire.

The UHF Communication System consists of portable transievers and fixed repeaters throughout the plant. These repeaters are powered from the 115 VAC A Vital Instrument Bus, which is located in the Relay Room on elevation 100'. Alternate shutdown procedures AOP-FIRE-1/2 require the use of the UHF Radio Communication System "G" to support communications from the Hot Shutdown Panel (213) to the remote operators located throughout the plant in order to facilitate bringing the plant to Hot Shutdown. Contrary to this capability, the potential exists for a postulated fire in the Relay Room to damage the repeater system power supply, causing the UHF Communication System to be inoperable.

The alternate shutdown procedures address worst case conditions, specifically Technical Specification required manning. Generally "G" sufficient personnel are available onsite who could be utilized to supplement inadequate radio coverage. In addition, limited sound powered phone coverage is available.

An automatically actuated CO₂ Flooding System is provided for the D/G Rooms of both Units. Actuation of this system for any D/G area also locks out ventilation for that area. The CO₂ system is actuated for each D/G room by the fire detection system in that room. The CO₂ system control cables run from panels located in the D/G vestibule area to the fire protection panel located in the Relay Room. A postulated fire could result in damage to these panels "H" and/or the cabling between them which, in turn could cause the spurious actuation of CO₂ into all three D/G rooms and ventilation isolation. A previous safety evaluation for a single failure concern assumed the loss of a D/G due to CO₂ flooding of the subject D/G room. This assumption was conservatively made because the D/G's ability to perform for an extended period in this atmosphere without ventilation had not been documented. This guidance was incorporated into station procedures. Therefore, if all three (3) D/G rooms were inadvertently flooded with CO₂ because of a postulated fire outside the D/G rooms, the D/G's would be declared inoperable.

CORRECTIVE ACTION:

Upon discovery of the SW Electrical Trains configuration in the SW Pipe Tunnel, a continuous fire watch was established at the entrance "A" to the SW Pipe Tunnel. The fire watch periodically walks down the length of the tunnel. PSE&G is reviewing design modification options to correct this deficiency.

The Marinite walls were reinforced prior to confirmation of their inadequate seismic design. The walls are now qualified to withstand

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CORRECTIVE ACTION (cont'd)

a design base seismic event without degrading adjacent safety related equipment. The Systems Analysis Group currently performs a safety/non-safety system and component interaction review of design changes. This review precludes design inadequacies of this nature.

"B" Also, the existing design control procedures incorporate multi-discipline cross checks and system interaction considerations. A sample of design changes installed prior to the implementation of these design control procedures will be conducted to confirm this discrepancy is an isolated occurrence.

Upon discovery of the RHR cabling deficiency, a roving hourly fire watch was established (both Units) for the Reactor Plant Auxiliary Equipment Area. A design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

"C" design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

Upon discovery of the SEC deficiency, a roving hourly fire watch was established (both Units) in the Upper Electrical Penetration Area. A design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

"D" design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

A fire watch is not required in this area since detection and redundant and diverse suppression capabilities exist in the area. A design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

"E" design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

Upon discovery of the cabling deficiencies in the Salem Units 1 and 2 CO₂ Equipment Rooms, a fire watch was established. A design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

"F" design change, meeting the requirements of 10CFR 50 Appendix R, will be implemented based on the recommendations of the Fire Protection Task Force.

Upon discovery of the UHF Communication design deficiency, a fire watch was established in the Unit 1 and 2 Relay Rooms. The UHF Communication System will be modified to be independent of the Control Room and Relay Room.

"G" Communication System will be modified to be independent of the Control Room and Relay Room.

To prevent the inadvertent simultaneous flooding of the three (3) D/G Rooms, the automatic actuation feature of the CO₂ Flooding System has been disabled. This was accomplished by tagging the detection key lockout switches in the manual mode. In accordance with Technical Specification 3.7.10.3, a fire watch has been posted to patrol the D/G area(s) and vestibule area. The fire watch has been extended to the vestibule area since a fire in this area could result in a CO₂ actuation to one or more D/G Rooms due to multiple spurious signals. The fire watch provides reasonable assurance that fire damage would be limited to one train of circuits.

"H" Technical Specification 3.7.10.3, a fire watch has been posted to patrol the D/G area(s) and vestibule area. The fire watch has been extended to the vestibule area since a fire in this area could result in a CO₂ actuation to one or more D/G Rooms due to multiple spurious signals. The fire watch provides reasonable assurance that fire damage would be limited to one train of circuits.

This report satisfies the reporting requirements of Technical Specification Action Statement 3.7.10.3.a pursuant to Specification 6.9.2 (both Units) since the D/G CO₂ Systems (both Units) are inoperable for greater than 14 days.

"H" Specification Action Statement 3.7.10.3.a pursuant to Specification 6.9.2 (both Units) since the D/G CO₂ Systems (both Units) are inoperable for greater than 14 days.

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CORRECTIVE ACTION (cont'd)


"H" Technical Specification Action Statement 3.7.10.3. states:

"With one or more of the above required CO₂ systems inoperable, within one hour establish a continuous fire watch with backup fire suppression equipment for those areas in which redundant systems or components could be damaged; for other areas, establish an hourly fire watch patrol. Restore the system to OPERABLE status within 14 days or, in lieu of any other report required by Specification 6.9.1, prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within the next 30 days outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status."

A design change meeting the safe shutdown requirements of 10CFR 50 "H" Appendix R will be implemented based on the recommendations of the Fire Protection Task Force.

A Safety Evaluation (S-C-M200-NSE-0709) has been issued. It addresses the justification for the continued operation of Salem Units No. 1 and No. 2 in light of the Appendix R concerns addressed in this LER.

The Fire Protection Task Force is continuing its review. If the Task Force identifies other reportable 10CFR 50 Appendix R deficiencies, in the course of its review, they will be incorporated into this Licensee Event Report as a "supplemental" report.


General Manager -
Salem Operations

MJP:pc

SORC Mtg. 87-085



PSEG

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

Salem Generating Station

October 16, 1987

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555.

1987 OCT 22 A 10 02
USNRC-DS

Dear Sir:

SALEM GENERATING STATION
LICENSE NO. DPR-75
DOCKET NO. 50-311
UNIT NO. 2
LICENSEE EVENT REPORT SUPPLEMENT 87-009-05

This supplemental Licensee Event Report is being submitted pursuant to the requirements of 10CFR 50.73(a)(2)(v). This report addresses an additional 10CFR 50 Appendix R inadequacy. This report has been issued within thirty (30) days of the discovery of this additional inadequacy.

Sincerely yours,

J. M. Zupko, Jr.
General Manager-
Salem Operations

MJP:pc

Distribution

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The Energy People