



PSEG

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

Salem Generating Station

May 6, 1982

Mr. J. Allan
Acting Regional Administrator
USNRC
Region 1
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Mr. Allan

LICENSE NO. DPR-75
DOCKET NO. 50-311
REPORTABLE OCCURRENCE 83-013/03L

Pursuant to the requirements of Salem Generating Station
Unit No. 2, Technical Specifications, Section 6.9.1.9.b,
we are submitting Licensee Event Report for Reportable
Occurrence 83-013/03L. This report is required within
thirty (30) days of the occurrence.

Sincerely yours,

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

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CC: Distribution

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The Energy People

Report Number: 83-013/03L
Report Date: 05-04-83
Occurrence Date: 04-09-83
Facility: Salem Generating Station Unit 2
Public Service Electric & Gas Company
Hancock's Bridge, New Jersey 08038

IDENTIFICATION OF OCCURRENCE:

Reactivity Control Systems - No. 22 Charging Pump - Inoperable.

This report was initiated by Incident Report 83-067.

CONDITIONS PRIOR TO OCCURRENCE:

Mode 6 - RX Power 0 % - Unit Load 0 MWe.

DESCRIPTION OF OCCURRENCE:

At 1618 hours, April 9, 1983, during routine shutdown operation, an operator observed increasing lube oil temperatures on No. 22 Charging Pump. At the time of the occurrence, the redundant charging pumps were unavailable due to maintenance activities associated with the shutdown. No. 22 Charging Pump was declared inoperable and Technical Specification Action Statement 3.1.2.3 was entered.

Investigation of the problem indicated that service water flow was being restricted to the charging pump as well as several other safety-related components; the components were all supplied by a common 4 inch branch of the No. 21 Service Water Header. Other components affected included No. 21 Containment Spray Pump Room Cooler, No. 22 Charging Pump Room Cooler, No. 21 Safety Injection Pump Lube Oil Cooler, and No. 21 Residual Heat Removal Pump Room Cooler.

Suspecting the flow may be restricted by shells of American oysters released during maintenance and cleaning of portions of the service water system earlier in the shutdown period, a backflush of the affected components was performed. The backflush path was through the Service Water System auxiliary feedwater pump cross-connect line. Upon opening the cross-connect line, silt was observed deposited in the end of the line; the silt and approximately 1/2 cubic feet of shells of oysters and other miscellaneous mollusks were removed in the process of flushing the line.

All operations involving core alteration and positive reactivity changes were suspended until the backflushing operation was completed and No. 22 Charging Pump was restored to an operable status.

Several weeks later, on April 21, 1983, investigation of a high jacket water temperature condition on No. 2C Emergency Diesel Generator revealed loose shells in the diesel jacket water and lube oil coolers. The diesel is also supplied by No. 21 Service Water Header, which had been completely refilled following the previous flushing evolution.

DESCRIPTION OF OCCURRENCE: (cont'd)

No problems were evident with Nos. 2A and 2B Diesel Generators. however, and surveillance of the generators has been satisfactorily completed to date (No. 2A Diesel Generator is normally supplied by No. 22 Service Water Header). Only two operable generators are required by the Technical Specifications during shutdown operation, and therefore compliance with the applicable limiting condition for operation was maintained.

APPARENT CAUSE OF OCCURRENCE:

In both cases the reduced service water flow was evidently caused by mollusk shells plugging the tubes of the coolers. Both living organisms and unattached shells were observed in the backflushes. Specimens of shells collected were unusually thin, and appeared to have been subjected to erosion.

Although problems with oysters restricting flow to the containment fan coil units (CFCUs) have been previously noted (see LERs 82-041/03L, 82-046/03L, 82-049/03L, 82-050/03L, 82-058/03L, and 82-117/03L), the events were random and relatively low in frequency. No problems with other safety related components had been observed during previous operation of the unit.

As noted in previous reports, oyster spat were apparently drawn into the Service Water System during operation, and were able to pass through the system strainers. They cemented themselves to piping walls in areas of moderate or reduced flow and developed shells. The oysters or shells were evidently released somewhat randomly during system operational events (pump shifts, lineup changes, etc.) and periodic chlorinations. The top shells of dead organisms would also be carried away following decay of the hinge.

Due to the previous problems, the No. 21 Service Water Header had been drained and manually cleaned where accessible. The 8 inch header upstream of all components involved except the diesels had been hydrolazed prior to the incident. Shells had been removed from the header, and reverse flow of the hydrolazing nozzle would likely have deposited a small volume of the shells in the 4 inch branch line which supplied the components. It was not possible to prevent a small amount of shells from entering the line, and it was assumed that the amount involved would have no significant impact on operating equipment.

According to the Environmental Department and biological consultants, living oysters removed by hydrolazing would likely survive in an unattached state. Draining of major portions of the header may have resulted in mortality of some oysters; increased mortality would also occur in stagnant portions of the system. Refilling and restoration of the system to operation could then result in the release of some top shells and carrying of unattached live organisms into portions of the system which were normally trouble-free. It should be noted that the problems are apparently related to shutdown activities and are not likely to occur during operation at power.

APPARENT CAUSE OF OCCURRENCE: (cont'd)

Settling of silt in low flow portions of the service water system has also been documented, particularly in the case of plugging of CFCU flow transmitter sensing lines (see LERs 82-028/01X-1 and 82-038/03L). The presence of silt in the normally blanked auxiliary feedwater pump supply cross-connect line is consistent with previously observed problems.

ANALYSIS OF OCCURRENCE:

Operability of the Service Water System ensures that sufficient cooling capacity is available for continued operation of safety related equipment during accident conditions. A boron injection system is required to be operable during Mode 6 operations to insure reactivity control capability is maintained.

The Auxiliary Feedwater System ensures that the Reactor Coolant System can be cooled to less than 350°F from normal operating conditions, in the event of a total loss of offsite power. The cross-connect to the Auxiliary Feedwater System is required to be available in 30 minutes in the event of a complete loss of A.C. power coincident with tornado missile damage to all redundant normal auxiliary feedwater supplies (auxiliary feedwater storage tank, demineralized water storage tanks, and fire protection/domestic water storage tanks).

As mentioned, the occurrences were apparently the result of shutdown maintenance activities, and would not have likely occurred during operation in elevated modes. Based on the initial results of an evaluation by the system Sponsor Engineer, the silt present in the auxiliary feedwater supply cross-connect would not have interfered with the availability of the supply or the proper function of the Auxiliary Feedwater System.

Action Statement 3.1.2.3 applies in Mode 6 and requires:

With no charging pump operable, suspend all operations involving core alterations or positive reactivity changes until at least one charging pump is restored to operable status.

As noted no core alterations or reactivity changes were conducted in compliance with the action statement. Due to this and the general confinement of the problems to shutdown modes, no risk to the health or safety of the public was involved. Because of operation in a degraded mode permitted by a limiting condition for operation, the occurrence is reportable in accordance with Technical Specification 6.9.1.9b.

CORRECTIVE ACTION:

As stated, core alterations and reactivity changes were suspended during inoperability of the charging pump. Remedial action was taken to clean or flush out the shells from the portions of the Service Water System involved. At 1315 hours, April 10, 1983, No. 22 Charging Pump was restored to operation and was satisfactorily tested. The pump was declared operable and Action Statement 3.1.2.3 was

CORRECTIVE ACTION: (cont'd)

terminated. The other safety related components involved were also satisfactorily tested and demonstrated to be operable.

Development of a chlorination program to fully eliminate the oysters from the Service Water System and to prevent reinfestation is in progress. Design Change Request 2EC-1327 has been submitted to provide continuous chlorine monitoring at the Circulating Water System discharge. The modification will allow increased levels and durations of chlorination.

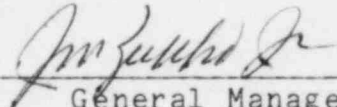
Due to concern over the overall problem of oysters in the Service Water System, a formal Safety Evaluation will be performed prior to the unit startup. Initial results of engineering investigation indicate that operation may safely proceed with only minor modification of the existing chlorination program. A one-time, increased chlorination will be performed to kill soft-bodied organisms, followed by a flush and inspection of the system. Any plugged components will be cleaned as necessary. A commitment to submit a Supplemental Report upon resolution of the oyster problem in general was made in LER 82-041/03L.

With respect to the accumulation of silt in the Auxiliary Feedwater System supply cross-connect, a Design Change Request will be issued to relocate the cross-connect isolation valve to eliminate future deposition of silt in the line.

FAILURE DATA:

Not Applicable

Prepared By R. Frahm



General Manager -
Salem Operations

SORC Meeting No. 83-060