SEP 18 1990

Docket Nos. 50-272
50-311

Public Service Electric and Gas Company
ATTN: Mr. Steven E. Miltenberger
Vice President and
Chief Nuclear Officer
P. O. Box 236
Hancocks Bridge, New Jersey 08038

Gentlemen:

Subject: Regional Waiver of Compliance Related to the No. 22 Containment Fan Coil Unit (CFCU), Salem Unit 2

This responds to your September 17, 1990 letter requesting a Regional Waiver of Compliance in order to allow continued operation of Salem Unit 2. A copy of your request with attachments is enclosed for reference.

After careful consideration of your request, we have concluded that (1) the proposed six-day extension of the Action Statement for Containment Cooling System Operability (Technical Specification 3.6.2.3) is warranted based on the actions taken and proposed to restore the No. 22 CFCU to an operable status, and (2) that the relief requested will not put the plant into an unsafe condition.

A Regional Waiver of Compliance is hereby granted for a six-day extension of the Action Statement for Containment Cooling System Operability in Technical Specification 3.6.2.3. The Temporary Waiver of Compliance grants relief from the requirements of Salem Unit 2 Technical Specification 3.6.2.3 with the following specific provisions.

1. Technical Specification 3.0.3 shall be entered immediately if any of the following conditions cannot be maintained while the Waiver is in effect.

   a. Refueling Water Storage Tank (RWST) temperature shall be less than or equal to 85 degrees F.

   b. Containment pressure shall be less than or equal to 0.2 psig.

   c. Service water (river water) temperature shall be less than or equal to 85 degrees F.

   d. All redundant safety equipment (CFCUs, ECCS and EDGs) shall be operable.

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2. The Waiver will expire upon declaring the No. 22 CFCU operable, at any time during the six-day extension upon determining the No. 22 CFCU cannot be restored within the six-day extension, or upon expiration of the six-day extension.

3. The above provisions are effective at 1:40 p.m. on September 18, 1990 and expire at 1:40 p.m. on September 24, 1990.

This Waiver and the provisions detailed above, were discussed by Mr. P. Swetland of this office with Mr. L. Miller on September 18, 1990.

Sincerely,

Original Signed By:

Charles W. Hehl, Director
Division of Reactor Projects

Enclosure: As Stated

cc w/encl:
J. Urban, General Manager, Fuels Department, Delmarva Power & Light Co.
L. K. Miller, General Manager - Salem Operations
B. A. Preston, Manager, Licensing and Regulation
General Manager - Nuclear Safety Review
J. T. Robb, Director, Joint Owner Affairs
A. C. Tapert, Program Administrator
R. Fryling, Jr., Esquire
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RI:DRP	RI:DRP	RI:DRP NRR	RI:DRP
for Pindale/meo 9/17/90	Swetland 9/18	Blough 9/18/90 Butler Weissman per telecon 9/18	Hehl 9/18/90

Public Service
Electric and Gas
Company

Stanley LaBruna

Vice President - Nuclear Operations

Public Service Electric and Gas Company P.O. Box 236, Hancocks Bridge, NJ 08038 609-339-4800

SEP 17 1990

NLR-N90183

**United States Regulatory Commission
Document Control Desk
Washington, DC 20555**

Gentlemen:

**REQUEST FOR REGIONAL WAIVER OF COMPLIANCE
TECHNICAL SPECIFICATION 3/4.6.2.3, CONTAINMENT COOLING SYSTEM
FACILITY OPERATING LICENSE DPR-75
SALEM GENERATING STATION UNIT NO. 2
DOCKET NO. 50-311**

Public Service Electric and Gas Company (PSE&G) hereby requests Regional Waiver of Compliance from the provisions of Technical Specification 3.6.2.3, Containment Cooling System. As discussed in Attachment 1, PSE&G has concluded that granting this request would involve neither a significant hazards consideration nor any irreversible environmental consequences.

This waiver is being requested in order to allow replacement of the #22 Containment Fan Cooler Unit (CFCU) motor without requiring plant shutdown. Salem Unit No. 2 is presently in a seven day Technical Specification Action Statement because #22 CFCU was declared inoperable at 1340 on September 11, 1990. A replacement unit has been received by PSE&G at 0345 on September 16, 1990. Additional information regarding the circumstances of this request is provided in Attachment 1.

Regional Waiver of Compliance is being requested because PSE&G is presently seeking relief from the provisions of Technical Specification 3.6.2.3 on a one time only basis for a period of six days beyond the provisions of the Action Statement. Compliance with the Technical Specification would result in forced shutdown of Salem Unit No. 2. The requested duration of the waiver is from prior to expiration of the Action Statement (1340 hours on September 18, 1990), until 1340 hours on September 24, 1990.

I. TECHNICAL SPECIFICATIONS 3/4.6.2.3 AND 3.0.3

Salem Unit 2 Technical Specification 3.6.2.3, applicable in Modes 1, 2 and 3, requires Operability of three independent groups of containment cooling fans, with two fan systems to each of two groups and one fan system to the third group.

Surveillance Requirement 4.6.2.3.b.1 requires that at least once per 18 months, each fan starts automatically on low speed on a safety injection test signal.

Technical Specification 3.0.3 requires, in part, that "when a Limiting Condition for Operation is not met except as provided in the associated ACTION requirements, within one hour action shall be initiated to place the unit in a MODE in which the specification does not apply . . ."

II. SUMMARY OF PRESENT SITUATION

On September 11, 1990, during maintenance activities to adjust the ventilation dampers of Salem Unit 2 Containment Fan Coil Unit (CFCU) No. 22, the unit tripped shortly after it was given a manual start signal for low speed (accident) mode of operation. Following this discovery, the subject CFCU was declared inoperable at 1340 hours on September 11, 1990, thereby requiring entry into the seven day Action Statement of Technical Specification 3.6.2.3. Efforts were initiated to determine the cause of the inoperability as well as to identify the appropriate actions.

Previous CFCU motor failures have been experienced at Salem. In 1976, a CFCU motor at Unit 1 experienced failures to start on low speed. The unit was removed from service and subsequently used as a test motor. In 1983, following a failure of a CFCU at Unit 1 (LER 272/83-052/03L), PSE&G and Westinghouse conducted investigations to identify the cause and determine corrective actions. Inspections and testing revealed indications of rotor damage, stator weld cracking and rotor-stator contact. The basic cause was determined to be a non-uniform air gap between the stator and rotor. High vibration was experienced during low speed starts, which is exacerbated by the close air gap. The non-uniform air gap resulted in unbalanced magnetic forces and contact between the rotor and stator.

This request has been reviewed and recommended for approval by the Salem Generating Station - Station Operations Review Committee.

Sincerely,

Attachment:

C Mr. J. C. Stone
Licensing Project Manager

Mr. T. Johnson
Senior Resident Inspector

Mr. T. Martin, Administrator
Region I

Mr. Kent Tosch, Chief
New Jersey Department of Environmental Protection
Division of Environmental Quality
Bureau of Nuclear Engineering
CN 415
Trenton, NJ 08625

Corrective actions taken prior to returning the affected CFCUs to service included rotor replacement, using a new swaged rotor design, and machining the unit to assure a uniform air gap. Subsequent engineering evaluations continued, utilizing data obtained from the test motor previously removed from service. Based on the engineering evaluation, a longer term upgrade was implemented to modify all motors to include the improved swaged rotor design, assure a uniform air gap, re-center the rotors to avoid eccentricity, and improve stator welds. To date, four of the five CFCU motors on each unit have been upgraded and replaced. The #22 CFCU had not been upgraded. Based on the inability to start the CFCU on low speed from a stopped condition, it was determined that the unit could not be restored to Operable status within the time limits of the Action Statement.

This situation could not be avoided for the following two reasons:

1) Due to the lead time necessary to upgrade each motor, both spare replacement motors were sent to Westinghouse in May, 1990. One of the spare CFCUs was expected to be used as an upgraded replacement during the next Unit No. 1 refueling outage (scheduled for Fall 1990 at the time it was shipped). The other spare was intended for use as an upgraded spare. The expedited delivery date for return of one of the spare motors is September 24, 1990. A replacement motor has been received from Pacific Gas and Electric (Diablo Canyon) on September 16, 1990.

2) Installation of the replacement unit inside containment during power operation must be performed within the constraints of the work environment. Had a replacement motor been immediately available, heat stress considerations would have resulted in little, if any, margin between installation time and the seven day allowable outage time.

In summary, given the lack of an immediately available spare due to upgrading, and the amount of time required to install a replacement motor, PSE&G believes the situation was unavoidable and that a Regional Waiver of Compliance is the appropriate mechanism for the requested relief.

III. REQUEST FOR REGIONAL WAIVER OF COMPLIANCE

PSE&G hereby requests a Waiver of Compliance from the requirements of Salem Unit No. 2 Technical Specification 3.6.2.3. Specifically, the following is requested:

PSE&G may extend the allowable outage time of Salem Unit No. 2 Technical Specification 3.6.2.3, Action a, on a one time basis, from seven days to thirteen days. The Action Statement was entered at 1340 hours on September 11, 1990. Therefore,

operation with #22 CFCU inoperable may continue until no later than 1340 hours on September 24, 1990.

IV. COMPENSATORY MEASURES

If any of the following limits are exceeded while the requested waiver is in effect, entry into Technical Specification 3.0.3 will be made:

1) Refueling Water Storage Tank (RWST) temperature shall be less than or equal to 85 degrees F.

2) Initial containment pressure shall be less than or equal to 0.2 psig.

3) Service Water (River Water) temperature shall be less than or equal to 85 degrees F.

These measures will assure that the evaluation performed in support of the No Significant Hazards Consideration (Section V) will not be invalidated while the requested waiver is in effect.

V. JUSTIFICATION FOR THE PROPOSED WAIVER OF COMPLIANCE

Justification for Proposed Time Duration of the Request

PSE&G is requesting that the proposed waiver be effective for six days beyond the normal seven day allowable outage time of the Action Statement. This time period is intended to allow sufficient time for replacement of the inoperable CFCU motor without requiring shutdown of Salem Unit No. 2. PSE&G believes that the requested time period is justified based on:

1) The time required to install the replacement unit as described in Section II, above.

2) The conclusions regarding Determination of No Significant Hazards Consideration and No Irreversible Environmental Consequences provided below.

Determination of No Significant Hazards Consideration

This proposed Waiver of Compliance:

1) Does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The Salem Generating Station Probabilistic Risk Assessment (PRA) model was used to assess the impact of the requested waiver on core damage frequency (CDF). The estimated change in CDF is

approximately 2E-8, which is four orders of magnitude lower than the base value of 1.0353E-4.

A deterministic evaluation of the effects of the inoperable CFCU on design basis LOCA and MSLB analyses has been performed by Westinghouse. Salem's licensing basis requires any one of the following combinations of available equipment in order to maintain post accident containment pressure below the design basis value of 47 psig:

1) All five CFCUs;

2) Both Containment Spray trains; or

3) Three CFCUs, one Containment Spray train and one Emergency Core Cooling System train.

The only Salem licensing basis analyses which model or take credit for CFCU performance are the Main Steam Line Break (MSLB) inside containment and the Loss of Coolant Accident (LOCA). Postulating a design basis accident (DBA) with the loss of the 2C Emergency Diesel Generator results in the availability of only 2 CFCUs, one Containment Spray train and one ECCS train. The present Salem licensing basis accident analyses conservatively assumes that four CFCUs are available for LOCA and MSLB cases that do not assume a failure of a safeguards train. The reanalyses performed in support of the requested waiver assume three available CFCUs for these cases.

Containment Spray and Containment Fan Cooling Systems are redundant to each other for the purposes of providing post accident cooling. No credit for iodine removal by the CFCUs is assumed in the accident analyses. Therefore, offsite dose calculations are not affected by the inoperable CFCU.

At the request of PSE&G, Westinghouse has performed an evaluation of the potential impact of the inoperable CFCU on containment design parameters following a DBA. Given the limited time duration of the requested waiver, more realistic input assumptions were used. These assumptions are based on actual plant conditions for the duration of the requested relief, but are conservative. They include:

1) RWST temperature is assumed to be 85 degrees F.

2) Initial containment pressure is assumed to be 0.2 psig (14.9 psia)

3) CFCU performance is based on Service Water temperature of 85 degrees F.

4) The limiting values for shutdown margin and moderator density coefficient are assumed to be 2.3% delta-rho and 0.23 delta-k/k/gm/cc, respectively.

As discussed in Section IV above, if assumptions 1, 2 or 3 are invalidated by actual plant conditions while the requested waiver is in effect, entry into Technical Specification 3.0.3 will be made. Assumption 4 is conservative with respect to actual reactor core conditions expected during the requested waiver period.

MSLB Evaluation

An evaluation of MSLB inside containment was performed to assure that 1) containment design pressure of 47 psig will not be exceeded and 2) the environmental qualification of equipment important to safety inside containment is not compromised. The following MSLB cases were reanalyzed:

A. 30% Power, Split Break, assuming Auxiliary Feedwater Flow runout protection failure. This case represents the peak pressure case in the present Salem licensing basis (46.86 psig).

B. 102% Power, Split Break, assuming Auxiliary Feedwater Flow runout protection failure. This case results in a peak containment pressure of 45.9 psig in the present licensing basis.

C. 102% Power, Smallest Double-Ended Rupture with entrainment, assuming failure of a containment safeguards train. This case results in the peak containment temperature in the present licensing basis.

D. 102% Power, Large Double-Ended Rupture Downstream of the steam flow restrictor, assuming failure of the Feedwater Control Valve to close. This case results in the highest temperature of the cases exhibiting a temperature peak in the longer term (250 to 700 seconds).

Containment Pressure

Reanalysis of Case A results in a peak containment pressure of 37.0 psig.

Case B results in a peak containment pressure of 36.4 psig.

Case C results in a peak containment pressure of 38.52 psig, vs. a previous value of 42.72 psig.

Case D results in a peak containment pressure of 40.54 psig, vs. a previous value of 42.01 psig.

It may be noted that Cases A and B realized a greater net reduction in peak pressure than Cases C and D. The split break cases (A and B) experience a greater return to criticality than the double ended ruptures (C and D). Therefore, the assumptions regarding more realistic shutdown margin and moderator density

coefficient result in a greater net benefit for the split breaks than for the double ended ruptures. The reduction in peak pressure for the double ended rupture cases is primarily attributable to the assumptions used regarding RWST and Service Water temperatures.

The other MSLB cases, which are less limiting for peak containment pressure in the present licensing basis, have not been reanalyzed. It is expected that the smaller breaks would realize benefits similar to Cases A and B. The larger breaks would be expected to realize benefits similar to Cases C and D. Therefore, all cases are expected to remain below the containment design pressure of 47 psig.

Containment Temperature

The peak containment temperatures associated with each of the analyzed cases (A through D) are enveloped by the existing containment temperature profile for Salem's Environmental Qualification (EQ) profile. Because similar behavior is expected for the cases which have not been reanalyzed, all cases are expected to remain below the present EQ envelope.

LOCA Evaluation

Containment Pressure

The Double Ended Pump Suction LOCA assuming loss of the 2C ESF train was reanalyzed. This is the most limiting case with respect to containment pressure and temperature in the present Salem licensing basis. The resulting peak containment pressure is 40.3 psig, compared to the previous value of 39.14 psig.

Containment Temperature

The LOCA temperature transient profile is bounded by the present EQ envelope.

It is expected that the presently limiting LOCA case would remain limiting, and that containment pressure and temperature response will remain within the limits of Salem's present licensing basis.

2) Does not create the possibility of a new or different kind of accident from any accident previously evaluated.

The requested waiver would allow a one time extension of the provisions of the Action Statement for one inoperable CFCU. It does not allow for any new accident scenarios to the Salem Generating Station. Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

3) Does not involve a significant reduction in a margin of safety.

The evaluations performed in support of this waiver support the conclusion that containment performance will remain within the limits established by the Salem licensing basis.

Based on the above, PSE&G has concluded that the requested waiver would not involve a significant hazards consideration.

Determination that the Request does not Involve Irreversible Environmental Consequences

The requested waiver does not allow for any increase in effluents that may be released offsite. Containment pressure must be maintained less than or equal to 0.2 psig (instead of the normal limit of 0.3 psig). However, any containment venting needed to maintain this limit will be performed consistent with the provisions of Technical Specification 3/4.6.1.7, Containment Ventilation System (i.e., under administrative controls).

The requested waiver does not involve an increase in occupational radiation exposure to personnel. Occupational radiation exposure is not an issue with respect to the allowable outage time of Technical Specification 3.6.2.3. The Radiation Protection controls that will be used for the CFCU motor replacement are the same as those that would have been used if this requested waiver was not necessary.

As provided above, PSE&G's conclusion is that the proposed waiver does not involve a Determination of No Significant Hazards Consideration.

Therefore, the request does not involve any irreversible environmental consequences.