



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NOS. 140 AND 119 TO FACILITY OPERATING

LICENSE NOS. DPR-70 AND DPR-75

PUBLIC SERVICE ELECTRIC & GAS COMPANY

PHILADELPHIA ELECTRIC COMPANY

DELMARVA POWER AND LIGHT COMPANY

ATLANTIC CITY ELECTRIC COMPANY

SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 AND 2

DOCKET NOS. 50-272 AND 50-311

1.0 INTRODUCTION

By letter dated February 2, 1993, as supplemented on March 16, 1993, the Public Service Electric & Gas Company (PSE&G), Philadelphia Electric Company, Delmarva Power and Light Company and Atlantic City Electric Company (the licensees) submitted a request for changes to the Salem Nuclear Generating Station, Unit Nos. 1 and 2, Technical Specifications (TS). The requested changes would add a note to Table 3.6-1, "Containment Isolation Valves", Section D, "Feedwater Isolation", stating that for the feedwater isolation BF-19 and BF-40 valves a partial-stroke test to ensure that the valve is free of any stem binding is acceptable to satisfy the post-maintenance test requirements of TS Sections 4.6.3.1.1 (Unit 1) and 4.6.3.1 (Unit 2) following a packing adjustment up to the manufacturer recommended value. A full-stroke test shall be conducted the first time the Unit enters operational MODE 3 following the packing adjustment. The words "range" and "timed" were added in the text of the added note for enhanced clarity and correctness per discussion with PSE&G. The March 16, 1993, letter and the added words provided clarifying information that did not change the initial proposed no significant hazards consideration determination.

2.0 EVALUATION

TS Sections 4.6.3.1.1 and 4.6.3.1 contain surveillance requirements for containment isolation valves, specifically:

"The isolation valves specified in Table 3.6-1 shall be demonstrated OPERABLE prior to returning the valve to service after maintenance, repair or replacement work is performed on the valve or its associated actuator, control or power circuit by performance of a cycling test and verification of isolation time.

The term "maintenance" is not a defined TS term. According to the ASME Boiler and Pressure Vessel Code (the Code), Section XI, Subsection IWV-3200, testing is required after "...maintenance that could affect [the valve's] performance...." This is further clarified; "Adjustment of stem packing, removal of the bonnet, ... are examples of maintenance that could affect valve performance parameters." The BF-19 and BF-40 valves are included in Salem Station's inservice testing program in accordance with Section XI of the Code, therefore, it is appropriate to adopt the Code definition in this case. The TS and Code required full-stroke testing of these valves after a packing adjustment at power, however, is not necessary due to the lack of effect on stroke-time, and is impractical due to having to perform a plant shutdown.

The 14" BF-19 valves are manufactured by Copes-Vulcan, the 4" BF-40 valves are installed in parallel with the BF-19s and are manufactured by Masoneilan. These valves are used for maintaining steam generator level (power levels  $\approx$ 5% to  $\approx$ 20% with the BF-40s which are fully closed at  $>$ 20% power, power levels  $\approx$ 20% and above with the BF-19s) and feedwater isolation, as well as containment isolation. The isolation functions of these valves require a valve closure time of less than 9 seconds, which is tested periodically. A verification of this closure time is required by Salem TS and the Code after any activities performed on these valves which could affect stroke time. The code mentions, as discussed above, packing adjustments as one of these activities.

All of these valves, however, utilize graphite packing with live loading, which has been shown to minimize the effect a packing adjustment would have on stroke-time. PSE&G has data from previous testing on BF-19 valves which demonstrate that adjusting the torque value at power to 17, 19, and 21 Ft-lbs (installation torque value is 13 Ft-lbs on clean, lubricated studs with no system pressure acting on the packing) resulted in stroke-times of  $\leq$ 5.5 seconds, obtained when plant conditions allowed. PSE&G discussions with Copes-Vulcan, the BF-19 valve manufacturer, concluded that the present required TS stroke time (9 seconds) would not be exceeded if the torque value does not exceed 20 Ft-lbs. The part-stroke test that will be performed immediately after the packing adjustment provides further assurance that the valve stem is free to move, indicating that the adjustment did not cause valve stem binding which would affect stroke-time. A full-stroke test would be conducted the first time the Unit enters operational MODE 3 following the packing adjustment.

The BF-40 valves remain fully closed throughout full power operation (power  $>$ 20%). This is the valves' fail-safe position, therefore negating the necessity for fast closure. The BF-40 valves are in service to control steam generator level for a short period of time during shutdown. Stroke-time after increased torque values is not available for these valves as PSE&G has not historically had any problems requiring packing adjustment on these valves. A part-stroke test will be performed on the BF-40s to ensure the absence of stem binding immediately after a packing adjustment at power, and a full-stroke test would be conducted the first time the unit enters operational MODE 3 following the packing adjustment.

The packing adjustment is performed at power only to correct occasional packing leaks. The valves' stem movement during operation allows the live load settings on the packing to loosen, requiring occasional adjustment of the packing to maintain zero leakage. The adjustment is performed in small increments, approximately 2 to 4 Ft-lbs, in order to make the minimum adjustment necessary to stop the leakage. PSE&G states in their submittal that the appropriate maintenance procedure has been modified to reflect Copes-Vulcan's recommended maximum torque value. This value for the BF-19 valves is 20 Ft-lbs. Because PSE&G has not experienced packing leaks on the BF-40 valves at power, the staff requested confirmation that the valve manufacturer (Masoneilan) would be consulted before adjusting the packing. This confirmation was in the supplement dated March 16, 1993. In a followup telephone call with the licensee's representative, E. Villar, it was also confirmed that the maintenance procedure would contain a requirement to contact the valve manufacturer before making the packing adjustment with the applicable unit at power. Also, as data became available for the BF-40 valves, the relationship between the packing torque values and valve stroke times would be analyzed.

The note proposed to be added to Table 3.6-1 includes a requirement that "A full-stroke test shall be conducted the first time the Unit enters operational MODE 3 following the packing adjustment." This test cannot be performed at power without incurring a reactor trip due to the feedwater regulating function of the BF-19 valves. A fast closure of the BF-40 valves at power would cause the BF-19 valves to respond to the feedwater flow transient, incurring a reactor trip. A slow, manually controlled part-stroke can be performed at power on either valve without incurring a reactor trip, allowing assurance that the valve stem is free to move which indicates that the adjustment did not cause valve stem binding which would affect stroke-time.

The feedwater isolation function of the BF-19 and BF-40 valves is backed up by motor-operated valve BF-13 (remotely operated from the control room with a 30-second closure time). The containment isolation function of the valves is backed up by motor-operated stop check valve BF-22. Valve BF-22 closes upon loss of feedwater flow and is made leak tight upon manual energization of the motor operator from the control room. The backup feedwater injection function is performed by the auxiliary feedwater system, a safety-related system which automatically injects to the steam generators on low water level. Should the BF-19 or BF-40 valves fail open, excessive feedwater flow is an analyzed accident in the Salem Updated Final Safety Analysis Report (UFSAR). This analysis bounds the failure of a BF-19 valve to close (a more severe single failure than failure of the BF-40 valve to close).

Based on the above information, the staff finds this change to the Salem Units 1 and 2 TS to be acceptable. The staff has also determined that relief from the Code requirements is not necessary, as the design characteristics of this type of packing allow increased torque values (to a manufacturer recommended maximum) without an adverse effect on the valve performance parameter (stroke-time).

### 3.0 STATE CONSULTATION

In accordance with the Commission's regulations, the New Jersey State official was notified of the proposed issuance of the amendments. The State official had no comments.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (58 FR 16231). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

### 5.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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