



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NOS. 54 AND 19 TO FACILITY OPERATING  
LICENSE NOS. NPF-39 AND NPF-85  
PHILADELPHIA ELECTRIC COMPANY  
LIMERICK GENERATING STATION, UNITS 1 AND 2  
DOCKET NOS. 50-352 AND 50-353

1.0 INTRODUCTION

By letter dated March 3, 1992, the Philadelphia Electric Company (PECo or the licensee) submitted a request for changes to the Limerick Generating Station, Units 1 and 2, Technical Specifications (TS). The requested changes would revise the Surveillance Requirements (SRs) and pertinent Bases of the TSs to incorporate the most recent recommendations contained in the American Society of Mechanical Engineers (ASME) Operations and Maintenance (OM) standard for snubber testing, ASME/ANSI OM-1990 Addenda to ASME/ANSI OM-1987, Part 4, "Examination and Performance Testing of Nuclear Power Plant Dynamic Restraints (Snubbers)." Specifically, the changes would 1) revise the 10% functional testing sampling plan (SR 4.7.4.e.1) 2) delete the 55 plan (SR 4.7.4.e.3), 3) incorporate the concept of "Failure Mode Grouping (FMG)" 4) remove the "reject" line from the 37 plan (SR 4.7.4.e.2) and 5) change the snubber functional testing interval from 18 to 24 months ( $\pm 25\%$ ) to accommodate a 24-month refueling cycle.

2.0 DISCUSSION

Snubbers are required to ensure that the structural integrity of the reactor coolant system and all other safety-related systems is maintained during and following a seismic or other event that initiates dynamic loads.

The proposed changes are a result of utility industry efforts to make snubber TS more realistic and easier to implement. These efforts were performed by the ASME Working Group and has the support of the Snubber Utility Group. A portion of this effort has resulted in previous changes to the visual inspection portion of the snubber testing TS.

On December 11, 1990, the Commission issued Generic Letter (GL) 90-09, "Alternate Requirements for Snubber Visual Inspection Intervals and Corrective Actions". The GL offered an alternate schedule for visual inspections as a line-item TS improvement. PECo elected to implement the new visual inspection program, which was approved for Limerick, Units 1 and 2, by Amendment Nos. 51 and 15 to Facility Operating License Nos. NPF-39 and NPF-85, respectively, on June 25, 1991. A visual inspection is the observation of the condition of

installed snubbers to identify those that are damaged, degraded, or inoperable as caused by physical means, leakage, corrosion, or environmental exposure. To verify that a snubber can operate within specific performance limits, the licensees perform functional testing that typically involves removing the snubber and testing it on a specially-designed test stand. Functional testing provides a 95 percent confidence level that 90 percent to 100 percent of the snubbers operate within the specified acceptance limits. The changes proposed in the subject application involve revisions to the current TS SRs for snubber functional testing in accordance with the recommendations in ASME Standard OM4.

The ASME standard on snubber testing, OM-1990, Part 4 contains two sample plans for inservice functional testing of snubbers. The two sample plans, when compared to the three sample plans currently contained in Section 4.7.5.e of the Limerick TSs and the current BWR Standard TSs, provide reduced testing and a corresponding reduction in man-rem exposure, while still providing adequate assurance of snubber reliability.

### 3.0 EVALUATION

The first of three Technical Specification sampling plans, the "10 percent plan", described in Specification 4.7.5.e(1) requires 10% of the snubbers to be tested periodically. It requires testing of an additional 10% of the snubbers for each snubber not meeting the acceptance criteria of Specification 4.7.4.f. The proposed change modifies this plan to require only a 5% additional testing for each snubber that fails functional testing as opposed to 10% additional testing presently required. Reducing the percentage of snubbers to be retested does not undermine the effectiveness of this surveillance. The initial test sample remains the same and is sufficient to provide an adequate sampling of the snubbers. This change will reduce the amount of additional testing required and thus reduce man-rem exposure and safety concerns associated with unnecessary functional testing. This change is consistent with the ASME OMc-1990, Part 4 document.

The second sampling plan, the "37 plan", described in Specification 4.7.4.e(2) requires that a representative sample of snubbers be tested periodically in accordance with Figure 4.7.4-1. Figure 4.7.4-1 provides the acceptance criteria method for the functional test results and denotes a "reject" region and a "continue testing" region. If at any time the plotted test results fall within this "reject" region, then all snubbers are to be functionally tested. The proposed change revises surveillance requirement 4.7.4.e(2) and Figure 4.7.4-1 to delete the "reject" region and substitute an expanded "continue testing" region.

With the deletion of the "reject" line, plotting of results by lot or individual basis becomes a moot point because snubbers must continue to be tested until the point falls into the "accept" region or until all snubbers have been tested. The proposed change also deletes references to the "reject" region in the text of Specification 4.7.4.e(2).

Figure 4.7.4-1 as it appears in the TSs was developed using "Wald's Sequential Probability Ratio Plan". Statistical studies using Wald's sequential sampling plan indicate that a major change in the reject line caused an insignificant change in the accept line or in other words acceptance is independent of rejection. These studies also demonstrate that while the probability of false acceptance of a bad snubber population under the proposed amendment still exists, it is negligible. As long as the "reject" line remains in the sample plan there is some possibility of rejecting a good snubber population and consequently requiring an unnecessary 100% functional testing of snubbers with attendant ALARA and safety concerns, manpower utilization and outage extension. The proposed TS change will alleviate these problems and still ensure continued or additional testing if snubber quality of failed snubbers is equal to or greater than 5%. These changes have been previously evaluated by the NRC through ANSI/ASME OMc-1990, Part 4 participation and by granting similar TS changes.

The third sampling plan, the "55 plan", presently described in specification 4.7.4.e(3) also requires that a representative sample of snubbers be periodically tested. Deleting the "reject" line from the "37 plan" makes the "55 plan" unnecessary. Moreover the "55 plan" is not a Wald sequential plan and as such has been deleted from the ANSI/ASME OMc-1990, Part 4 document.

The proposed changes clarify the additional functional testing requirements necessary due to failure of snubbers. TS 4.7.4.e states that if during the functional testing, additional sampling is required due to failure of only one type of snubber, the functional test results shall be reviewed at that time to determine if additional samples should be limited to the type of snubber which has failed the functional testing. The proposed changes allow categorization of unacceptable snubbers into failure mode groups (FMG). A test failure mode group shall include all unacceptable snubbers that have a given failure mode and all other snubbers subject to the same failure mode. It allows independent testing of failure mode groups based on the number of unacceptable snubbers and requires one additional test sample from the general population for each failure mode group to provide assurance that failure mode groups have been properly established. This change is consistent with the ASME OMc-1990, Part 4 document.

The proposed change also addresses the functional test failure analysis of locked up snubbers. TS 4.7.4.g currently states that if the cause of the locked up snubbers is due to manufacturer or design deficiency, all snubbers of the same type subject to the same defect shall be functionally tested. PECO proposes to delete the last (third) paragraph currently in Section 4.7.4.g (top of page 3/4 7-15) as being redundant to the other requirements.

To reflect the above changes, the licensee is also revising the bases (page B 3/4 7-3) to note that functional testing of snubbers is based on the ASME/ANSI OMc Standard.

In the application of March 3, 1992, the licensee also proposed to change the snubber functional testing interval in SR 4.7.4.e from 18 months to 24 months ( $\pm 25\%$ ) to accommodate a 24 month refueling cycle. As noted previously, the licensee had proposed to retain the present requirement in SR 4.7.4.e.(1) that 10% of the total population of each snubber type be initially tested. The 10% minimum sample every 1.5 years (18 months) would mean that all snubbers in the plant are likely to be functionally tested at least once every 15 years. If there are significant failures which requires expansion of the initial sample size, the entire population of some types of snubbers could be tested in less than 15 years. From the test data available, it appears that 15 years may be a reasonable expected service life for most snubbers, particularly those exposed to a harsh environment. If the test period is extended to 24 months while retaining the 10% initial sample size, a particular snubber could be in service for 20 years before being tested.

One way of maintaining the 15-year testing cycle when increasing the time between testing (i.e., lengthening the fuel cycle) is to increase the initial sample size proportionately. If the test period is being increased from 18 to 24 months, increasing the initial sample size by a third, from 10% to 13.3%, would maintain the 15 year cycle.

On April 2, 1991, the Commission issued Generic Letter (GL) 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle." The GL stated that licensees proposing to increase surveillance intervals because of longer fuel cycles should confirm that historical plant maintenance and surveillance data support the conclusion that there is a small effect on safety. As an alternative to increasing the initial sample test size, a licensee could provide snubber test data demonstrating that all types of snubbers can be expected to perform reliably for more than 15 years (e.g., 20 years for a 2-year fuel cycle).

We discussed with the licensee's staff the issues related to the proposed change to extend the surveillance interval from 18 to 24 months. Limerick, Unit 1 shutdown March 21, 1992 for the fourth refueling outage. During this outage, the maintenance personnel are functionally testing snubbers in accordance with the present TSs. The changes addressed in this safety evaluation would somewhat reduce the number of snubbers to be tested and correspondingly reduce man hours of testing and radiation exposure. Resolution of the issues regarding extension of the surveillance interval may require collection of historical data by the licensee. The NRC staff proposed and the licensee agreed that this issue be resolved separately so as to not further delay issuance of the other TS changes in the application.

Accordingly, the TSs being issued with these amendments retain the 18 months in the present TSs (first line of page 3/4 7-13). Since there is no change being made in the surveillance interval, there is no change in the staff's no significant hazards consideration determination.

We have concluded, based on staff review and on considerations discussed above that the proposed changes to the TSs are acceptable. These changes would result in reduced testing and a corresponding reduction in man-rem exposure while providing adequate assurance of snubber reliability. They are also consistent with the ASME/ANSI OMc-1990, Part 4 document.

#### 4.0 STATE CONSULTATION

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

#### 5.0 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 and change surveillance requirements. 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 off-site, 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 (57 FR 9452). 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.

#### 6.0 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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