

Docket No. 50-293

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JUL 30 1982

Mr. A. Victor Morisi
Manager, Nuclear Operations
Support Department
Boston Edison Company
25 Braintree Hill Park
Rockdale Street
Braintree, MA 02184

*Mr. Fields
Mr. Haushey
Mr. Pascoe
Gray*

Dear Mr. Morisi:

Re: Pilgrim Nuclear Power Station

In our letter of November 29, 1978 we identified the generic concerns of purging and venting of containment to all operating reactor licensees and requested your response to these concerns. Our review of your response was interrupted by the TMI accident and its demands on staff resources. Consequently, an Interim Position on containment purging and venting was transmitted to you by letter dated October 22, 1979. You were requested to implement short-term corrective actions to remain in effect pending completion of our longer term review of your response to our November 29, 1978 letter.

Over the past several months we and our contractors have been reviewing the responses to our November 1978 letter to close out our long-term review of this rather complex issue. The components of this review are as follows:

- 1. Conformance to Standard Review Plan Section 6.2.4 Revision 1 and Branch Technical Position (BTP) CSB 6-4 Revision 1.

These documents were provided as enclosures to our November 1978 letter.

- 2. Valve Operability

Although the Interim Position allowed blocking of the valves at partial-open positions, this is indeed an interim position. Earlier we requested a program demonstrating operability of the valves in accordance with our "Guidelines for Demonstrating Operability of Purge and Vent Valves." These Guidelines were sent to you in our letter of September 27, 1979. There is an acceptable alternative which you may wish to consider in lieu of completing the valve qualification program for the large butterfly-type valves. This would be the installation of a fully qualified mini-purge system with valves 8 inches or smaller to bypass the larger valves. Such a system change might prove more timely and more cost-effective. The system would meet BTP, CSB 6-4, item B.1.c.

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3. Safety Actuation Signal Override

This involves the review of safety actuation signal circuits to ensure that overriding of one safety actuation signal does not also cause the bypass of any other safety actuation signal.

4. Containment Leakage Due to Seal Deterioration

Position B.4 of the BTP CSB 604 requires that provisions be made to test the availability of the isolation function and the leakage rate of the isolation valves in the vent and purge lines, individually, during reactor operations. But BTP CSB 6-4 does not explain when or how these tests are to be performed. Enclosure 1 is an amplification of Position B.4 concerning these tests.

The status of our long-term review of the above items for the Pilgrim Nuclear Power Station is as follows:

1. Conformance to Standard Review Plan Section 6.2.4 Revision 1 and Branch Technical Position CSB 6-4 Revision 1

We have completed our preliminary review of this item and have identified the need for additional information as indicated in Enclosure 2 to this letter. A restatement of salient features of the staff position is provided in Enclosure 3 for your information and to assist you in formulating your response. You are requested to provide the additional information requested in Enclosure 2 within 60 days of receipt of this letter.

2. Valve Operability

This item is still under review. By letters dated March 4, 1981 and June 26, 1981, you provided additional information in response to our September 27, 1979 letter which requested a program demonstrating purge and vent valve operability. This response will be the subject of future communications as the staff review progresses.

3. Safety Actuation Signal Override

This item is still under review. Boston Edison Company responded by letters dated September 29 and October 10, 1980 to questions contained in an August 12, 1980 letter from the NRC. Our August 12, 1980 letter requested information on manual override of the engineered safety features of the containment isolation valves. This item will be the subject of future correspondence as the staff review progresses.

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4. Containment Leakage Due to Seal Deterioration

We request that you propose Technical Specification (TS) changes incorporating the best recommendations set forth in Enclosure 1 together with the details of your proposed test program within 60 days of receipt of this letter. If the results of current and past surveillance are believed to demonstrate operability of these valves, provide this information as justification for not increasing the surveillance requirements.

In closing, you may have noted the similarity of this long-term generic issue with Item II.E.4.2 of NUREG-0737, TMI Action Plan. Except for Position 5 of Item II.E.4.2, the review of the remaining outstanding positions of Item II.E.4.2 will be completed by this purge and vent review. Our schedule of the purge and vent review agrees with the schedule for Item II.E.4.2.

Your assistance in completing the outstanding purge and vent items, noted above, is necessary to complete Item II.E.4.2. Recently developed Model Technical Specifications necessary to finalize the purge and vent part of Item II.E.4.2 are provided for your consideration as Enclosure 4. We request that you review existing Technical Specifications (TS) against the sample provided herein. For any areas in which your existing TS needs expansion, you are requested to provide a TS change request within 60 days of receipt of this letter.

The reporting and/or recordkeeping requirements contained in this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P.L. 96-511.

Please contact your NRC Project Manager should you have any questions.

Sincerely,

ORIGINAL SIGNED BY
V.L. Rooney for post

Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing

Enclosures:
As Stated

cc w/encls:
See next page

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PURGE/VENT VALVE LEAKAGE TESTS

The long term resolution of Generic Issue B-24, "Containment Purging During Normal Plant Operation," includes, in part, the implementation of Item B.4 of Branch Technical Position (BTP) CSB 6-4. Item B.4 specifies that provisions should be made for leakage rate testing of the (purge/vent system) isolation valves, individually, during reactor operation. Although Item B.4 does not address the testing frequency, Appendix J to 10 CFR Part 50 specifies a maximum test interval of 2 years.

As a result of the numerous reports on unsatisfactory performance of the resilient seats for the isolation valves in containment purge and vent lines (addressed in OIE Circular 77-11, dated September 6, 1977), Generic Issue B-20, "Containment Leakage Due to Seal Deterioration," was established to evaluate the matter and establish an appropriate testing frequency for the isolation valves. Excessive leakage past the resilient seats of isolation valves in purge/vent lines is typically caused by severe environmental conditions and/or wear due to frequent use. Consequently, the leakage test frequency for these valves should be keyed to the occurrence of severe environmental conditions and the use of the valves, rather than the current requirements of 10 CFR 50, Appendix J.

It is recommended that the following provision be added to the Technical Specifications for the leak testing of purge/vent line isolation valves:

"Leakage integrity tests shall be performed on the containment isolation valves with resilient material seals in (a) active purge/vent systems (i.e., those which may be operated during plant operating Modes 1 through 4) at least once every three months and (b) passive purge systems (i.e., those which must be administratively controlled closed during reactor operating Modes 1 through 4) at least once every six months."

By way of clarification, the above proposed surveillance specification is predicated on our expectation that a plant would have a need to go to cold shutdown several times a year. To cover the possibility that this may not occur, a maximum test interval of 6 months is specified. However, it is not our intent to require a plant to shutdown just to conduct the valve leakage integrity tests. If licensees anticipate long duration power operations with infrequent shutdown, then installation of a leak test connection that is accessible from outside containment may be appropriate. This will permit simultaneous testing of the redundant valves. It will not be possible to satisfy explicitly the guidance of Item B.4 of BTP CSB 6-4 (which states that valves should be tested individually), but at least some testing of the valves during reactor operation will be possible.

It is intended that the above proposed surveillance specification be applied to the active purge/vent lines, as well as passive purge lines: i.e., the purge lines that are administratively controlled closed during reactor operating modes 1-4. The reason for including the passive purge lines is that 8-20 is concerned with the potential adverse effect of seasonal weather conditions on the integrity of the isolation valves. Consequently, passive purge lines must also be included in the surveillance program.

The purpose of the leakage integrity tests of the isolation valves in the containment purge and vent lines is to identify excessive degradation of the resilient seats for these valves. Therefore, they need not be conducted with the precision required for the Type C isolation valve tests in 10 CFR Part 50, Appendix J. These tests would be performed in addition to the quantitative Type C tests required by Appendix J and would not relieve the licensee of the responsibility to conform to the requirements of Appendix J. In view of the wide variety of valve types and seating materials, the acceptance criteria for such tests should be developed on a plant-specific basis.

DRAFT SAFETY EVALUATION REPORT
FOR CONTAINMENT PURGING AND VENTING DURING
NORMAL OPERATION OF
THE PILGRIM NUCLEAR POWER STATION, UNIT 1

(Docket No. 50-293)

I. INTRODUCTION

A number of events have occurred over the past several years which directly relate to the practice of containment purging and venting during normal plant operation. These events have raised concerns relative to potential failures affecting the purge penetrations which could lead to degradation in containment integrity, and, for PWRs, a degradation in ECCS performance. By letter, dated November 28, 1978, the Commission (NRC) requested all licensees of operating reactors to respond to certain generic concerns about containment purging or venting during normal plant operation. The generic concerns were twofold:

1. Events had occurred where licensees overrode or bypassed the safety actuation isolation signals to the containment isolation valves. These events were determined to be abnormal occurrences and were so characterized in our report to Congress in January 1979.
2. Recent licensing reviews have required tests or analyses to show that containment purge or vent valves would shut without degrading containment integrity during the dynamic loads of a design basis loss of coolant accident (DBA-LOCA).

The NRC position of the November 1978 letter requested licensees to cease purging (or venting) of containment or limit purging (or venting) to an absolute minimum. Licensees who elected to purge (or vent) the containment were requested to demonstrate that the containment purge (or vent) system

design met the criteria outlined in the NRC Standard Review Plan (SRP) 6.2.4, Revision 1, and the associated Branch Technical Position (BTP) CSB 6-4, Revision 1.

II. DISCUSSION AND EVALUATION

The licensee responded to the NRC position letter of November 1978, by stating in a letter dated August 21, 1979, that a Technical Specification change to reflect the 90 hours per year limitation on purge valves not associated with the containment differential pressure operation is being processed and will be forwarded in the near future. The licensee subsequently stated in a letter dated March 4, 1981, that Operating Procedure No. 2.2.70 entitled "Primary Containment Atmospheric Control System" has been revised to incorporate administrative controls which will limit the time the 20-inch butterfly-type vent/purge valves are open to 90 hours per year during power operation.

The licensee indicated in a letter dated January 30, 1980, the intention to provide detailed instructions for installing baffle plates on the drywell pipe penetrations to prevent entry of potentially harmful debris. Further, the licensee indicated they do not plan to install baffles on the torus pipe ends, as modifications are presently being made as part of the Mark I Containment Program, which will prevent the possibility that attachments will break away and enter these lines.

The licensee indicated that their analysis revealed that escaping air and steam could result in over-pressurization of parts of the downstream duct work if both 20-inch isolation valves were full open during a LOCA situation. The licensee committed to implement the modifications which are being de-

veloped and will, upon implementation, protect the fans, filters and duct work located beyond the purge system isolation valves against potential loss of function due to a LOCA environment.

III. CONCLUSIONS

We have reviewed the Pilgrim purge system against the provisions of BTP CSB 6-4 (Revision 1), "Containment Purging During Normal Plant Operations." The licensee has not provided sufficient information concerning the provisions made to insure that isolation valve closure will not be prevented by debris which could potentially become entrained in the escaping air and steam. One acceptable means of addressing this concern is the installation of debris screens which meet seismic Category I criteria. Furthermore, the licensee should propose Technical Specification changes within 60 days which limit the use of the 20-inch purge/vent isolation valves to 90 hours per year when not in cold shutdown.

In addition, as a result of numerous reports on the unsatisfactory performance of resilient seats in butterfly-type isolation valves due to seal deterioration, periodic leakage integrity tests of the 20-inch butterfly isolation valves in the purge system are necessary. Therefore, the licensee should propose a Technical Specification for testing the valves in accordance with the following testing frequency:

"The leakage integrity tests of the isolation valves in the containment purge/vent lines shall be conducted at least once every three months."

The purpose of the leakage integrity tests of the isolation valves in the containment purge lines is to identify excessive degradation of the resilient seats for these valves. Therefore, they need not be conducted with the precision required for the Type C isolation valve tests in 10 CFR Part 50, Appendix J. These tests would be performed in addition to the quantitative Type C tests required by Appendix J, and would not relieve the licensee of the responsibility to conform to the requirements of Appendix J.

Subject to successful implementation of the above recommended actions, we find the purge/vent system design and operating practices for Pilgrim 1 to be acceptable.

Enclosure 3

1. Purging/venting should be minimized during reactor operation because the plant is inherently safer with closed purge/vent valves (containment) than with open lines which require valve action to provide containment. (Serious consideration is being given to ultimately requiring that future plants be designed such that purging/venting is not required during operation).
2. Some purging/venting on current plants will be permitted provided that:
 - a) purging is needed and justified for safety purposes, and
 - b) valves are judged by the staff to be both operable and reliable, and
 - c) the estimated amount of radioactivity released during the time required to close the valve(s) following a LOCA either
 - i. does not cause the total dose to exceed the 10 CFR Part 100 Guidelines; then a goal should be established which represents a limit on the annual hours of purging expected through each particular valve, or
 - ii. causes the total dose to exceed the guideline values; then purging/venting shall be limited to 90 hours/year.
3. Purging/venting should not be permitted when valves are being used that are known to be not operable or reliable under transient or accident conditions.