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Supplemental Response to Generic Letter 88-01 (TAC No. 69153)

This letter responds to your April 26, 1990 evaluation of our submittals on Generic Letter 88-01. Attachment A provides supplemental information to the three areas questioned by the NRC Contractor Technical Evaluation Report. Attachment B is a page of the recent Boiling Water Reactor Owners' Group Improved Technical Specifications.

This letter completes our responses to Generic Letter 88-01.

for R. G. Bird

JDK/njm/5071

Attachments A & B

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Generic Letter (GL) 88-01 "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping" required all BWR Licensee's to provide their current plans relating to piping replacement, inspection, repair and leakage detection for piping 4" or larger made of austenitic stainless steel and containing reactor coolant at a temperature above 200 degrees Fahrenheit during power operation. Licensees were requested to indicate whether they intended to follow the guidance included in GL 88-01 or propose alternative measures. Boston Edison (BECo) responded accordingly in letters dated August 4, 1988 and June 19, 1989. The NRC determined these responses to be acceptable and, with the exception of three items, concluded the proposed IGSCC inspection and mitigation program will provide reasonable assurance of maintaining the long-term structural integrity of austenitic stainless steel piping at Pilgrim Station. The three exceptions are:

1. BECo's position on exclusion of welds in the Reactor Water Cleanup System piping outboard of the containment isolation valves.

2. BECo's position to reduce sample expansion size when technically justified.

3. BECo's position not to amend Technical Specifications to include a statement that the Inservice Inspection (ISI) program will comply with the NRC staff positions contained in GL 88-01 on schedule, methods, personnel, and sample expansion.

BECo was requested to provide its plans to address the three exceptions.

Accordingly, we have evaluated our previous positions as requested and respond as follows:

1. <u>Inspection of Reactor Water Cleanup (RWCU) System Welds Outboard of the Containment Isolation Valves</u>

   The RWCU contains 67 non-safety related piping welds outboard of the isolation valves. We will perform an inspection of 10% of these welds during each refueling cycle. If a flaw is discovered in the 10% sample and IGSCC is determined as the probable cause, another 10% will be inspected. If an IGSCC induced flaw is discovered in the second 10% sample, no further inspections will be conducted. The identified flaws will be repaired and plans will be made to replace RWCU non-code piping in subsequent refueling outages.

   Our basis for this is:

   - The system design protects against a pipe break. The RWCU system is designed to automatically isolate if a pipe break outboard of the isolation valves were to occur. Two motor-operated isolation valves, one on either side of primary containment, are automatically closed by signals from instrumentation installed to detect breaks in the RWCU

system, among other isolation signals. Pipe breaks or leaks in the RWCU room would be detected by a high temperature indication, a high flow indication or a combination of both.

- The IGSCC phenomena would cause leakage long before a pipe break. Since IGSCC is a slow deterioration process, any leak in piping susceptible to it would develop slowly, allowing time for operators to detect the leak, isolate the system, and repair the leak.

- The original code and non-code welds were made and inspected to the same high standards. The large bore process piping (4 inches nominal diameter and larger) in the RWCU system is installed as "Nuclear" service class per the Piping Design Specification (M-300)for Pilgrim. This means the piping was inspected to the nuclear non-destructive examination (NDE) requirements (Radiographic Exams). We consider the code related welds now being examined by the IGSCC augmented inspection program , plus the additional 10% inspection of the non-code related welds, provide a representative sample of the welds in the entire RWCU system.

- Prior inspections of the code-welds have shown no IGSCC. 31 code-related welds in the RWCU system are inboard of the isolation valves and are categorized as IGSCC class D meaning they are 100% inspected every other outage (50% each outage). Due to their close proximity to the non-code piping welds in the RWCU system they are subjected to an IGSCC environment similar to the non-code class piping (i.e. reactor coolant greater than 200°F, IGSCC sensitive piping). IGSCC augmented inspections of these welds have so far been negative.

- No RWCU welds were excluded from our submittal based on temperature considerations. The weld database was formulated using the design temperature from the Piping Design Specification (M300) for Pilgrim. Additionally, the process diagrams were used as a cross check on the design temperature. Plant experience has indicated the actual service temperatures are much lower and in some cases could prove to be lower than 200°F. However, the more conservative use of the design temperature specification has been selected.

- Inspection of all 67 non-code welds would not meet ALARA principles. A review of radiation exposure data by our ALARA group indicates the radiation exposure recorded for 10 welds examined for IGSCC in the RWCU room during RFO 7 was 10.42 Rem. This figure includes time spent on scaffold erection and removal, insulation (asbestos) removal and reinsulating, weld preparation, and the actual ISI exam. Therefore, the exposure for one weld exam is about 1.04 Rem. Using this number as an average, if we are required to inspect the approximately 67 non-code welds, the resulting exposure would be 69.7 Rem for the first outage (100% inspection) and 38.8 Rem per outage (50% inspection) for the non-code welds every outage thereafter. These exposures will be increased as much as a factor of 3 during later RFO's after hydrogen water chemistry is in continuous use.

2. Sample Expansion

We will revise the Augmented Inspection program to reflect the sample expansion guidance of the generic letter for code-related welds as stated below.

If one or more cracked welds in IGSCC Categories A,B, or C, are found by a sample inspection during the 10 year interval, an additional sample of the welds in that category will be inspected, approximately equal in number to the original sample. This additional sample will be similar in distribution (according to pipe size, system, and location) to the original sample, unless it is determined there is a technical reason to select a different distribution. If any cracked welds are found in this sample, all of the welds in that IGSCC Category will be inspected.

If significant crack growth or additional cracks are found during the inspection of an IGSCC Category E weld, all other Category E welds will be examined.

a) Significant crack growth for overlayed welds is defined as crack extension to deeper than 75% of the original wall thickness, or for cracks originally deeper than 75% of the pipe wall, evidence of crack growth into the effective weld overlay.

b) Significant crack growth for SI mitigated Category E welds is defined as growth to a length or depth exceeding the criteria for SI mitigation (either 10% of circumference in length or 30% of the wall in depth)

3. Technical Specifications (TS)

In the NRC April 26, 1990 Safety Evaluation Report (SER), two TS issues were identified. As stated in the SER:

"The licensee is requested to submit a TS change to include a piping ISI statement as required in GL 88-01 and submit as committed in the licensee's letter of June 19, 1989, the TS on leakage monitoring with the exception that unidentified leakage may be monitored every eight hours instead of every four hours".

With respect to the TS on leakage monitoring, our letter of June 19, 1989 did not commit to submit a TS change, but instead referred to our TS change submittal of February 4, 1985 that included the requested leakage monitoring LCO's and surveillances. This submittal differed with the generic letter TS model in terms of frequency of leakage monitoring, but was evaluated and considered acceptable by the NRC. The April 26, 1990 SER states:

"The staff has re-evaluated the frequency of leakage monitoring. After discussions with several BWR licensees the staff concluded that monitoring every four hours creates an unnecessary administrative hardship on the plant operators. Therefore, the staff takes exception to the TER recommendation and considers the licensee's position to monitor unidentified leakage every eight hours acceptable".

Thus, we consider the February 4, 1985 proposed change to be in conformance with the GL 88-01 request for leakage monitoring and plan no further revisions.

The other TS issue concerns the inclusion of an ISI statement in the TS. The GL 88-01 request states:

> "A change to the Technical Specifications to include a statement in the section on ISI that the Inservice Inspection Program for piping covered by the scope of this letter will be in conformance with the staff positions on schedule, methods and personnel, and sample expansion included in this letter (see enclosed model BWR Standard Technical Specification). It is recognized that the Inservice Inspection and Testing sections may be removed from the Technical Specifications in the future in line with the Technical Specifications Improvement Programs. In this case, this requirement shall remain with the ISI section when it is included in an alternative document".

Since issuance of GL 88-01, the Boiling Water Reactors Owners' Group (BWROG) and NRC Standard TS Improvement Committees have agreed to changes to the BWR Standard TS. The latest TS model of April 28, 1989 (Attachment B) does not include an ISI statement as proposed by the GL. Our understanding is that Attachment B reflects the latest agreement reached with the NRC and BWROG Standard TS Improvement Committees regarding the inclusion of an ISI statement in TS.

We maintain active representation on the BWROG Improved BWR TS Committee. Our plan is to adopt the Standard TS model soon after it receives final NRC approval. The latest schedule calls for a final draft submittal by the BWROG by the end of November 1990. The NRC expectation is to be able to issue a SER by mid- May 1991. We continue to align ourselves with this effort and plan to revise our TS according to the final agreement reached between the NRC and BWROG. In the interim, we will revise our Augmented Inspection program to include a statement indicating compliance with the GL 88-01 positions on schedule, methods, and personnel. A statement on sample expansion will also be included to reflect our commitments discussed in issues 1 and 2 above.

3.0 APPLICABILITY

SURVEILLANCE REQUIREMENTS (SRs) (continued)

SR 3.0.4 Entry into a MODE or other specified condition in the Applicability shall not be made unless the Surveillance Requirements associated with a Limiting Condition for Operation have been met. This provision shall not prevent passage through, or to, MODES or other specified conditions as required to comply with the Required Actions. Exceptions to these requirements are stated in the individual Specifications.

SR 3.0.5 Inservice inspection and testing of ASME Code Class 1, 2 and 3 components shall be applicable as follows:

a. Inservice inspection of components, and inservice testing of pumps and valves, shall be in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda (the Code) except where relief has been requested pursuant to 10 CFR 50.55a(g)(6)(i).

b. Test Frequencies specified in Section XI of the Code shall be applicable as follows:

Code Terminology	Frequency
Weekly	7 days
Monthly	31 days
Quarterly or every 3 months	92 days
Semiannually or every 6 months	184 days
Every 9 months	276 days
Yearly or annually	366 days
Biannual or every 2 years	732 days

c. The provisions of SR 3.0.2 are applicable to the above Code required Frequencies.

d. Performance of Code inservice inspection and testing shall be in addition to the specified Surveillance Requirements.

e. Nothing in the Code shall supersede the requirements of these Technical Specifications.