Entergy

Entergy Nuclear Operations, Inc.
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Plymouth, MA 02360

John A. Dent, Jr.
Site Vice President

March 25, 2014

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

SUBJECT: Pilgrim Relief Request PRR-25 Rev. 1, Proposed Alternative, Request for Relief for Temporary Acceptance of a Flaw in Salt Service Water (SSW) System Pipe Spool JF29-8-4.

Entergy Nuclear Operations, Inc
Pilgrim Nuclear Power Station
Docket 50-293
License No. DPR-35

LETTER NUMBER: 2.14.032

Dear Sir or Madam:

Pursuant to 10 CFR 50.55a(a)(3)(ii), Entergy Nuclear Operations, Inc. (ENO) hereby requests NRC approval of the Request for Relief for a Proposed Alternative for the Pilgrim Nuclear Power Station (PNPS). This alternative is for the current fourth 10-year inservice inspection interval.

This Request for Relief is submitted because a through-wall flaw was discovered in a safety class 3 Salt Service Water System 18-inch rubber-lined carbon steel elbow associated with system piping that returns cooling water to Cape Cod Bay. PNPS has performed an operability evaluation of the through-wall flaw and determined that the spool and associated piping system continues to be capable of performing its required safety function, as discussed herein. Immediate repair or replacement of the piping spool piece would require a plant shutdown and result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The requested Relief Request maintains the quality and safety considerations of structures, systems, and components required for safe operation of Pilgrim Nuclear Power Station. This revised relief request supersedes Relief Request No. PRR-25, previously submitted by Entergy via Letter No. 2.14.023, dated March 5, 2014.

Attachments 1 through 7 provide the description of Relief Request and Regulatory Commitments, including supporting documentation,

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NRR

If you have any questions concerning this relief request, please contact Mr. Joseph Lynch, Regulatory Assurance Manager at 508-830-8403.

Sincerely,

John A. Dent, Jr.
Site Vice President

Attachment 1 - Pilgrim Relief Request PRR-25, Proposed Alternative (10 Pages)
Attachment 2 - List of Regulatory Commitments (1 Page)
Attachment 3 - Pilgrim Salt Service Water Discharge Piping Elbow (JF29-8-4) Wall Thinning Stress Analysis, Structural Integrity Associates Calculation No. 1400287.301, Rev. 0 (22 Pages)
Attachment 4 - Flaw Evaluation of SSW Discharge Piping Leaking Elbow, Structural Integrity Associates Calculation No. 1400287.302, Rev. 0 (20 Pages)
Attachment 5 - SSW Spool JF29-8-4 NDE Data Sheets (4 Pages)
Attachment 6 - Mechanical Clamp Information (2 Pages)
Attachment 7 - SSW Spool JF29-8-4 NDE Data Sheets (10 Pages)

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Pilgrim Nuclear Power Station

ATTACHMENT 1

TO ENTERGY LETTER 2.14.032

Relief Request Number PRR-25 Rev. 1 - Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii), Hardship or Unusual Difficulty Without Compensating Increase in Level of Quality and Safety Discussion

(10 Pages)

1. ASME Code Component(s) Affected / Applicable Code Edition

Components/ Numbers:	Salt Service Water System pipe spool JF29-8-4, American Society of Mechanical Engineers (ASME) Class 3, ASTM A-234 Grade WPB carbon steel material (rubber lined)
Code of Record:	ASME Section XI, 2001 Edition through 2003 Addenda as amended by 10 CFR 50.55a (piping design code ASME B31.1 1967 edition)
Description:	Salt Service Water pipe spool JF29-8-4, located downstream of Reactor Building Closed Cooling Water (RBCCW) heat exchanger E-209B
Unit / Inspection Interval:	Pilgrim Nuclear Power Station (PNPS) / Fourth 10-Year Interval

2. Applicable Code Requirements

The ASME Boiler and Pressure Vessel Code, Rules for In-service Inspection of Nuclear Power Plant Components, Section XI, 2001 Edition through 2003 Addenda, as amended by 10 CFR 50.55a.

The request for relief applies to the requirements of ASME Code Section XI, 2001 Edition through 2003 Addenda, Article IWD-3000, which establishes flaw size acceptance standards (IWD-3500) and provides analytical evaluation criteria (IWD-3600) for flaws identified during performance of in-service inspections and tests. In the 2001 Edition through 2003 addenda, IWD-3500 and IWD-3610 default to IWC-3500 and IWC-3610, respectively. IWC-3610 defaults to IWB-3610. IWB-3610 does not include analytical evaluation criteria for acceptance of through-wall flaws.

ASME Code Case N-513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping, Section XI, Division 1," which has been conditionally approved by the NRC in Regulatory Guide 1.147, "In-service Inspection Code Case Acceptability, ASME Section XI, Division 1", provides analytical evaluation rules for temporary acceptance of flaws in piping. However, Code Case N-513-3 does not apply to through-wall flaws located in the pressure retaining base material of pipe fittings such as elbows.

Paragraph 1(c) of Code Case N-513-3 states:

> *"The following flaw evaluation criteria are permitted for pipe and tube. The flaw evaluation criteria are permitted for adjoining fittings and flanges to a distance of* $(R_o t)^{1/2}$ *from the weld centerline."*

The through-wall flaw in spool JF29-8-4 is located in a 90° elbow and not bounded by this criterion, therefore Code Case N-513-3 as conditionally approved by the NRC cannot be applied in this case.

Accordingly, this relief request proposes an alternative to the referenced provision of Code Case N-513-3 that prohibits application to fittings such as elbows.

3. Reason for Request and Basis for Use

On February 24, 2014, seawater was observed leaking from Salt Service Water (SSW) pipe spool JF29-8-4, an elbow, located in the Class 3 SSW system downstream of Reactor Building Closed Cooling Water (RBCCW) heat exchanger E-209B. Leakage of approximately 60 drops-per-minute (dpm) was found to originate from an approximately 3/8"diameter hole in the extrados of the downstream elbow of the 18 " rubber-lined carbon steel (schedule 20, 0.312" nominal wall thickness) pipe spool. Leakage is minimized due to the rubber lining immediately behind the hole remaining intact and blocking flow and the fact that the normal operating pressure for the heat exchanger discharge flow at this location is 2 psig.

To determine extent of condition, ultrasonic thickness measurements were taken on the elbow in a 6" wide by 360° band around the circumference of the pipe. The only significant thinning detected was found in the immediate vicinity of the hole encompassing a region less than 4" in diameter and in another small adjacent area measuring approximately 1.5"x1.5". The thinnest reading adjacent to the hole was 0.046" compared to the pipe nominal thickness of 0.312". The combined flaw size was calculated to be 5 ¼ x 5 ¼ inches square. Attachment 5 provides the Non-destructive Examination (NDE) data sheet for the SSW spool JF29-8-4. No other leakage was visually observed elsewhere in the service water system discharge piping from RBCCW heat exchanger, E-209B.

A brief description of the Salt Service Water System is provided for clarity. The SSW system is designed to function as the ultimate heat sink for all the systems cooled by the RBCCW and Turbine Building Closed Cooling Water (TBCCW) systems during all planned operations in all operating states by continuously providing adequate cooling water flow to the secondary sides of the RBCCW and TBCCW heat exchangers. The SSW system consists of two open loops. The SSW pumps (two per loop plus a common spare) take suction from Cape Cod Bay, the ultimate heat sink, and discharge to a common header from which independent piping supplies each of the two cooling water loops. Each loop contains one reactor building and one turbine building cooling water heat exchanger. The water then returns to the bay from the outlet of the heat exchanger. Two division valves are included in the common pump discharge header to permit the SSW system to be operated as two independent loops. Either of the two subsystems is capable of providing the required cooling capacity (4500 gpm) to support the required systems with two pumps operating. The maximum design and operating temperatures for the discharge side of the SSW system is 100°F and 80°F respectively. The maximum design and operating pressure for the discharge side of the SSW system is 10 psig.

NRC Inspection Manual Chapter, IMC 0326, "Operability Determinations & Functionality Assessments for Resolution of Degraded or Nonconforming Conditions Adverse to Quality of Safety, Appendix C, Specific Operability Issues, Item C.1 1, "Flaw Evaluation" (dated January 31, 2014), addresses evaluations of ASME Class 2 and Class 3 system components with through-wall flaws. When ASME Class 2 or Class 3 components or construction code acceptance standards or, the requirements of NRC-endorsed ASME Code Case or NRC approved alternative are not met, then a determination of whether the degraded or nonconforming condition results in the Technical Specifications required system, structure, or component being inoperable is required.

This section of the NRC Inspection Manual also states that whenever a flaw does not meet ASME Code or construction code acceptance standards or the requirements of an NRC endorsed ASME code case, a relief request needs to be submitted in a timely manner after completing the operability determination process documentation.

Accordingly, a structural evaluation for spool JF29-8-4 was performed. The basis for the operability evaluation includes Structural Integrity Associates (SIA) Calculations No. 1400287.301, Rev. 0 (Attachment 3) and No. 1400287.302 Rev. 0 (Attachment 4). The flaw in the 18-inch elbow of the SSW piping at Pilgrim has been evaluated (Attachment 4) using the methods of a pending revision to Code Case N-513-3, currently in the ASME approval process.

Code Case N-513-3 does not provide evaluation criteria for flaws in elbows, while the pending revision does provide evaluation criteria for flaws in elbows. This pending revision has not been approved by the ASME or reviewed by the NRC; however, it is recognized in ASME committee that the technical approach is very conservative. The most limiting flaw size is 8 inches in the circumferential direction. The leak is easily bounded in the axial and circumferential directions by 8 inches. Thus, the acceptance criteria of the pending revision are met as shown in the SIA calculation (Attachment 4). This Pilgrim Relief Request, PRR-25, Rev. 1 is being submitted in accordance with the requirements of NRC Inspection Manual for approval of an alternative method for flaw evaluation.

The original approximately 3/8" diameter hole was located on the extrados of the Schedule 20 rubber-lined carbon steel elbow that is butt-welded to the downstream end of SSW spool JF29-8-4. The spool is located on the discharge side of RBCCW heat exchanger E-209B. Downstream of this spool, the discharge flow from the TBCCW heat exchanger combines with the RBCCW heat exchanger discharge flow and discharges into Cape Cod Bay.

Although not visible, the degradation mechanism causing the leak in spool JF29-8-4 is believed to be internal local corrosion of the carbon steel piping caused by local failure of the rubber lining. PNPS has extensive experience with this failure mechanism in the SSW system and it is well understood by PNPS staff. Internal corrosion of the pipe wall with the rubber lining remaining intact indicates that the lining in the immediate vicinity of the flaw has been compromised and seawater has migrated to and settled at the flaw location causing localized corrosion of the pipe wall.

The lining of this spool was known to be degraded following an internal inspection of the rubber lining in RFO19 in April 2013. Localized Belzona repairs of the lining were implemented on April 25, 2013. The current condition may indicate a failed Belzona repair as some of the RFO19 repairs were made to the elbow ID within a few inches of the current pressure boundary flaw.

The original plan to resolve this issue included a weld overlay design based on ASME Code Case N-661-1 "Alternative Requirements for Wall Thickness Restoration for Raw Water Service" which has been conditionally approved by the NRC in Regulatory Guide 1.147. The code case requires that the through wall defect be sealed by welding prior to the application of the weld overlay. Due to the wall thinning near the defect area, attempted repairs of the piping by seal welding has not been successful in stopping all leakage. These attempts used plugs (backing material) to reduce leakage flow to permit welding. Currently, the seal welds are experiencing minor weepage which prevents the NDE prior to the weld overlay from being performed.

The activities associated with plugging and seal welding resulted in an increased area of through wall leakage due to the locally thinned conditions. Because the plugs and seal welds are not credited, it was determined this increased area could exceed the flooding limit for this location. The appropriate shutdown LCO was entered.

Leakage would not affect the ability of the SSW system to perform its design cooling functions because the location of the flaw is downstream of the RBCCW and TBCCW heat exchangers. Proper cooling capacity to the RBCCW and TBCCW heat exchangers will be maintained for all postulated leakage rates related to this pipe spool. Additionally, the low design and normal operating pressures (10 and 2 psig, respectively) in this segment of the SSW system contribute to minimize leakage from pressure boundary defects at this location. Significant leakage from this location would be managed by a 14" dewatering line between Auxiliary Bay 'B' and the Torus Compartment, which is of sufficient size to handle any potential leakage or flooding from the flaw location. Because unmitigated leakage would pose a long term concern with Torus Compartment and Quadrant flooding, an engineered mechanical clamp with gasket material was fabricated and installed in accordance with the PNPS Appendix B design control program for safety-related equipment. The seismic mechanical clamp assembly is installed for leakage mitigation only and provides no contribution towards structural integrity of the affected piping.

Spool JF29-8-4 can be isolated from the upstream portion of the SSW system by valves MO-3806, 29-HO-3834 and 29-HO-3839 but not from the downstream portion of the system, which discharges to Cape Cod Bay.

4. Hardship to Repair

Performing a code repair/replacement activity now to correct the flaw discovered in pipe spool JF29-8-4 would require the plant to shut down and create a hardship based on the potential risks associated with unit cycling and emergent equipment issues incurred during shutdown and startup evolutions.

No compensating increase in the level of quality and safety would be gained by immediate *repair of the flaw. The operability evaluation of the through-wall flaw determined that the* affected system continues to be capable of performing its required safety functions.

5. Burden Caused by Compliance

It is impractical to complete a suitable Code-acceptable repair to the identified SSW leak at Pilgrim Station without shutting the plant down. Shutting the plant down in mid-cycle creates undue and unnecessary stress on plant systems, structures, and components.

6. Proposed Alternative and Basis for Use

Structural Evaluation

The request for relief applies to the requirements of ASME Code Section XI, 2001 Edition through 2003 Addenda. As noted in Section 2 of this request, Article IWD-3000 establishes flaw size acceptance standards (IWD-3500) and provides analytical evaluation criteria (IWD-3600) for flaws identified during performance of in-service inspections and tests. However, the Code does not include analytical evaluation criteria for acceptance of through-wall flaws in pressure retaining base material of ferritic pipe or fittings.

Code Case N-513-3, "Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping, Section XI, Division 1," which has been conditionally approved by the NRC in Regulatory Guide 1.147, "In-service Inspection Code Case Acceptability, ASME Section XI, Division 1," provides analytical evaluation rules for temporary acceptance of flaws in piping. Code Case N-513-3 however does not apply to through-wall flaws located in the pressure retaining base material of pipe fittings such as elbows.

Pursuant to 10CFR50.55a(a)(3)(ii), Entergy proposes the following alternative to the paragraph 1(c) provision of Code Case N-513-3 that prohibits its application to pipe fittings such as moderate energy class 3 elbows.

Entergy is proposing an alternative to the flaw evaluation methodology of Code Case N-513-3. The Code Case N-513-3 flaw evaluation methodology is applicable to straight pipe. The Entergy proposed alternative methodology is based upon and consistent with a pending revision to Code Case N-513-3 and is used in the SIA calculation (Attachment 4) to evaluate the flaw in SSW spool JF29-8-4. The evaluation criteria provided in Code Case N-513-3 are only for straight pipe since the technical approach relies on ASME Section XI, Appendix C methods. The pending revision of Code Case N-513-3 referenced above includes rules for the evaluation of piping components such as elbows, branch tees and reducers. Flaws in these components may be evaluated as if in straight pipe provided the stresses used in the evaluation are adjusted to account for geometric differences. For elbows, hoop stress is adjusted by considering flaw location and primary stress due to elbow ovalization from axial loads. For axial stresses, the stress scaling follows the same approach given in ASME Section III, ND-3600 [5] design by rule using stress indices and stress intensification factors for the adjustment. Details are provided in the pending revision to Code Case N-513-3 for determining these adjusted stresses.

The pending revision to Code Case N-513-3 used to evaluate the flaw in SSW spool JF29-8-4 in Attachment 4 has not been approved by the ASME or reviewed by the NRC; however, it is recognized in ASME committee that the technical approach is very conservative. Simple treatment of piping component flaw evaluation using hand calculations was an important objective in the development of the approach recognizing the trade-off being conservative results. The methodology in the pending revision allows for more sophisticated analysis by the user.

Entergy evaluated the as-found condition of the SSW elbow and proposes temporary acceptance of the condition of the pipe spool to allow continued operation in lieu of performing an immediate code repair/replacement activity. The as-found condition was evaluated using the proposed alternative methodology discussed herein and is documented in the SIA calculation (Attachment 4). The evaluation concluded, in part, that the allowable through-wall flaw sizes are greater than 10" in the axial and 8" in the circumferential direction, that the through-wall flaw is stable and the pipe will not fail catastrophically under design loading conditions.

Welding Process Cracking

Welding of the ASME SCXI Code Case N-661-1 backing material (plugs) did not compromise the piping structural integrity because:

1. The backing material is mild carbon steel (A36)
2. The weld rod being used (E6010). .
3. The mild steel elbow base metal (A234, Grade WPB) is a tough material, with low hardenability, and resistant to crack initiation and propagation.
4. It is not expected that the welding process (Shielded Metal Arc Welding) will result in the formation of martensite in the base material.
5. Hydrogen cracking, if it occurs, would likely be in the heat affected zone of the base material. Residual stress would be minimal in this location due to the weld configuration, so crack initiation is unlikely.
6. The backing material and welding are within the 3 x 2 ¼ inch degraded area. This area is surrounded by material that is generally at the nominal wall thickness (0.312 inch) providing generous margin to evaluated minimum wall requirements for the allowable degraded area (approximately 8 x 16 inches).
7. The CC N-513-3 structural evaluation was developed based on a postulated crack-like flaw in the degraded area.

Although NDE on the backing material and associated welds could not be completed due to the inability to perform the surface preparation of the thinned area, Pilgrim Station is confident that any flaw will not pose a risk to structural integrity of the pipe as evaluated in accordance with ASME SCXI Code Case N-513-3.

Corrosion Considerations

Various Pilgrim Station documents related to failures of rubber lining in sections of salt service water piping have been reviewed for the purpose of establishing a corrosion rate. The following sources were considered:

- Calculation M469, Rev. 0 (1991) – evaluated wall loss rate of 0.05 in/year based on measured wall loss after degraded rubber lining in PNPS SSW spool
- Calculation M470, Rev. 0 (1991) – evaluated wall loss rate of 0.07 in/year based on measured wall loss after degraded rubber lining in PNPS SSW spool
- Safety Evaluation SE2683 (1992) – performed in support of Temporary Modification TM91-32. PNPS used a corrosion rate of 0.03 in/year based on industrial test programs for unprotected carbon steel in sea water with flow conditions comparable to Pilgrim Station, which showed an overall corrosion rate of 0.02 in/year
- Root Cause Evaluation, PR.97.9399 (1997) – once rubber lining is delaminated due to age or other mechanisms and carbon steel pipe wall is exposed to the service water system flow, the corrosion rate is estimated to be 0.10 in./year (based on evaluation of 3 in situ cases at PNPS)

Based on these evaluations and in the absence of an empirical wear rate, a conservative corrosion rate of 0.150 in/year is established for consideration of further thinning of the degraded area until our refueling outage in April 2015. Based on this conservative wear rate, it has been demonstrated that additional wall loss in the material surrounding the degraded area due to lining failure would meet Code requirements at the end of operation for this cycle.

Rubber Lining Considerations

The degraded elbow in piping spool JF29-8-4 is carbon steel (ASTM A234, Gr. WPB) and is rubber lined. As discussed in Specification M308 the lining is natural rubber (ASTM D2227 GR 5) with a minimum thickness of 3/16 inch.

Prior experience with welding on rubber lined SSW pipe spools at PNPS is provided in Temporary Modification 98-18. As described in the temporary modification, testing in the form of a mockup was performed to determine whether welding to a water backed carbon steel pipe would damage the rubber lining. The results showed that no damage occurred. Reference is also made to a repair on 18" spool JF29-9-5 where examination showed no rubber lining damage behind the weld area. Consistent with the criteria specified in TM 98-18, a 200°F maximum interpass temperature was specified to prevent damage to the elbow's rubber lining during welding of the backing plate. In addition, the present aborted Temporary Modification specifies using a 3/32 inch size Filler Metal to limit heat input.

In the event that some of the rubber lining is damaged by welding, if it becomes detached from the piping, it is not of concern because it is downstream of the system heat exchangers; any small pieces of rubber will flow unobstructed to Cape Cod Bay. Any additional corrosion has been considered in the establishment of the conservative corrosion rate of 0.150 in/year. Therefore it can be concluded that the wall thickness of the elbow around the engineered clamping device is more than adequate for the duration of the temporary repair. The thickness/ corrosion will be monitored by the periodic UT.

Flooding Considerations

Calculated flow rate of the degraded area is negligible when compared to the SSW system flow of 4500gpm. Under this condition, air would be introduced into the flow stream under certain low tide conditions; however, this would be minor compared to the overall discharge flow path. Any seawater backflow through the hole at high tide would be bound by the operating pressure condition with respect to leakage. Regarding a 30 day mission time, leakage would need to be limited to an amount which would not exceed the capacity of the torus compartment post-accident. Based on torus compartment available volume (Reference: Operability Evaluation for CR-PNP-2011-04503 (Torus room floodable volume)) a leakage rate of up to approximately 12 gpm could be tolerated. For a leakage rate of 12 gpm, the through wall flaw size would need to be limited to 0.54" in diameter. The attempted ASME SCXI Code Case N-661-1 repair opened a hole greater than 0.54" and the flow rate approached 15 gpm. This triggered a 72 hour LCO. Therefore a seismically rugged and safety related clamping device was designed and installed on the degraded area of the elbow. The clamping device has a 4 x 4 inch pad that covers the present area of degradation. The pad size is small enough that the surrounding material can be UT inspected for wall thinning to identify any on-going degradation without concern for compromising the allowable area of degradation which was analyzed to the requirements of ASME SCXI Code Case 513-3. It should also be noted that where the periphery of 4 x 4 inch clamp sits on the elbow full nominal wall thickness (0.312 inch) is available. While the clamp is preloaded to preclude slippage during a seismic event, the required wall thickness around the

clamp periphery necessary to accommodate the preload is on the order of the minimum required thickness for pressure (0.006 inches).

Current leakage with the seismic mechanical clamp installed is zero leakage.

Engineered Mechanical Clamp

A mechanical clamp assembly has been designed and fabricated to function as a safety related device to minimize system leakage. Specifically, unmitigated leakage from the SSW discharge piping located within the 'B' Aux Bay would be directed to the Torus compartment via the open 14" dewatering lines. Flooding depth in the torus compartment could ultimately reach the openings to the Quads, at which point the safety-related equipment within the Quads could be adversely affected by the flood water.

Based on this function, the design, materials, and fabrication of the clamp assembly were treated as safety-related as documented in Temporary Modification EC49957 (and associated change notice EC49968).

The degraded wall section of the SSW discharge piping is located on the 90 degree elbow of the 18" rubber lined carbon steel piping down stream of valve MO-3806 (Line 18"-JF-29, Ref M212 SH1).

The mechanical clamp assembly has a simple configuration. It consists of a 4"x 4" piece of carbon steel that was cut from 18" pipe stock so as to have a contour similar to the degraded section of the elbow. Soft gasket material is applied to the inside surface of the plate in order to fit snuggly against the contour and accommodate any surface irregularities of the existing elbow. The plate/gasket are located directly over the section of the elbow where the wall thinning and leakage has been identified. It is held in place by an 18" long tangent U-Bolt. The plate is welded to the inside of the crown of the U-Bolt. The U-Bolt is then held in place by means of a strong-back (3"x3" steel angle iron) which spans between the U-Bolt legs on the opposite side of the elbow. A similar contoured and gasketed steel plate is located between the strong-back and the elbow wall to achieve good bearing/contact while protecting the surface of the elbow.

Per Temporary Modification (TM) EC49957, the clamp assembly is designed (see Attachment 6) to remain intact and in position during a design basis seismic event. The clamp is prevented from sliding along the elbow by friction/clamping action which results from specified installation torque of the U-Bolt nuts. The TM also addresses the effects of the clamp on the overall seismic behavior of the piping. Based on the relatively small additional weight and mass, the effect on overall seismic response is found to be acceptable.

The footprint of the gasketed plate was specifically sized to cover the degraded area of the elbow wall while overlapping onto structurally sound wall material as identified by the UT inspections to date. In sizing the plate, consideration was also given to future UT inspections to be performed with the clamp assembly in place. The plate was sized and the overall clamp assembly was arranged to minimize interference with UT inspections, while still performing its leak mitigating function. UT thickness readings taken around the perimeter of the plate will provide early indication of any additional degradation of the elbow wall and serve as the basis for additional actions.

The bearing pressure of the gasket material on the elbow wall is controlled by the tension in the U-Bolt legs which is a function of the specified installation torque of U-Bolt nuts. The torque was calculated to achieve a bearing pressure sufficient to get mild compression of the gasket material while not imposing significant force/stress on the elbow wall. Specifically, a contact force of 600 lb was selected which results in a contact pressure of 38 psi over the 16 in2 area of the gasket. The design system pressure at the location of the elbow is 10 psi per Spec M300 (actual operating pressure is typically less than 2 psi). Although the preload in the clamp assembly is intentionally small to preclude any potentially adverse effects, the bearing pressure is sufficiently higher than the piping pressure which will ensure that the previously installed repair materials and/or degraded existing wall areas cannot be ejected and result in gross leakage at this location.

Maximum operating temperature and design temperature of the piping are low (100°F max per Specification M300) and relatively stable at this location of the SSW System. As such, the thermal expansion and contraction of the piping is minimal and will have no significant effect on the pretension in the clamp assembly.

Based on the safety function of the clamp assembly, the materials are all specified to be safety-related / Q with the exception of the gasket material which is typically exempt in piping system applications.

The work package for the TM installations classified as quality-related and contains appropriate QC hold points, welding controls, and torque verifications.

The proposed alternative methodology is based on PNPS performing the following actions:

<u>7. Post Repair Monitoring</u>

1. PNPS will perform a daily visual walk down of pipe spool JF29-8-4, with the insulation removed, to confirm that the analysis conditions used in the evaluation remain valid.

2. PNPS will perform periodic UT examinations in accordance with Code Case N-513-3 that bound the flaw location and adjacent pipe wall to establish a wear rate and validate that the bounding flaw size from the evaluation completed in support of the operability evaluation is not exceeded over the mission time of the discharge pipe.

3. PNPS will replace pipe spool JF29-8-4 no later than when either

   (1) The predicted flaw size from either periodic inspection or by flaw growth analysis exceeds the acceptance criteria, or

   (2) During the next scheduled outage, whichever occurs first.

   The next scheduled outage is planned to begin in April 2015.

4. A sample size of at least five of the most susceptible and accessible locations, or, if fewer than five, all susceptible and accessible locations shall be examined within 30 days of detecting the flaw in accordance with the requirements (including scope expansion) of Code Case N-513-3. (**Action Complete – Five additional areas have been examined with no degradation noted.**)

8. Duration of Proposed Alternative

The requested Code relief shall be used until Code repair/replacement activities are performed on pipe spool JF29-8-4 either during the next scheduled outage or when the predicted flaw size exceeds acceptance criteria. The next scheduled outage is the refueling outage planned to begin in April 2015.

9. Precedents

This relief request is similar in nature to the relief requests listed below, which were authorized by the NRC and involved through-wall flaws in ASME Class components.

1. McGuire Nuclear Station, Unit 1, March 26, 2008, (ML 080580577)
2. Turkey Point Unit 3, January 1, 2014, (ML 14030A183)
3. San Onofre Units 2 and 3, May 19, 2010, (ML 101440381)
4. Turkey Point Unit 3, October 23, 2013, (ML 13318A010)
5. Seabrook Station, February 9, 2014 (TAC No. MF2731)

ATTACHMENT 2

TO ENTERGY LETTER 2.14.032

PILGRIM RELIEF REQUEST PRR-25, Rev 1

List of Regulatory Commitments

(1 Page)

LIST OF REGULATORY COMMITMENTS

This table identifies actions discussed in this letter for which Entergy commits to perform. Any other actions discussed in this submittal are described for the NRC's information and are not commitments.

<table>
<tr><th rowspan="2">COMMITMENT</th><th colspan="2">TYPE
(Check one)</th><th rowspan="2">SCHEDULED COMPLETION DATE
(If Required)</th></tr>
<tr><th>ONE-TIME ACTION</th><th>CONTINUING COMPLIANCE</th></tr>
<tr><td>LR-LAR-2014-00046-01: PNPS will perform a daily visual walk down of pipe spool JF29-8-4, with the insulation removed, to confirm that the analysis conditions used in the evaluation remain valid.</td><td></td><td>X</td><td>PNPS will perform a daily visual walk down of pipe spool JF29-8-4 until replacement of spool.</td></tr>
<tr><td>LR-LAR-2014-00046-02: PNPS will perform periodic UT examinations in accordance with Code Case N-513-3 that bound the flaw location and adjacent pipe wall to establish a wear rate and validate that the bounding flaw size from the evaluation completed in support of the operability evaluation is not exceeded over the mission time of the discharge pipe.
.</td><td></td><td>X</td><td>PNPS will perform periodic UT examinations in accordance with Code Case N-513-3 of affected area of the spool JF29-8-4 until replacement of spool.</td></tr>
<tr><td>LR-LAR-2014-00046-03: PNPS will replace pipe spool JF29-8-4 no later than when either:

(1) The predicted flaw size from either periodic inspection or by flaw growth analysis exceeds the acceptance criteria, or

(2) During the next scheduled outage whichever occurs first.</td><td>X</td><td></td><td>During Refueling Outage 20.</td></tr>
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