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Millstone Power Station
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Dominion

JUL 11 2003

Docket No. 50-423
B18930

10 CFR 50.55a(g)(6)(i)

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Power Station, Unit No. 3
Relief Request From ASME Code Section XI Repair and Replacement Requirements
For a Flaw in a Service Water System Brazed Joint

Dominion Nuclear Connecticut, Inc. (DNC) requests relief from the Section XI requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, pursuant to 10 CFR 50.55a(g)(6)(i). This request is based upon the impracticality of performing an ASME Code repair on a leak in a brazed joint of the Service Water (SW) system while the plant is operating. Enclosure 1 to this letter describes the temporary compensatory actions taken by DNC and the basis for the requested relief. Permanent Code repair for this flaw is scheduled for the next cold shutdown greater than 30 days or the next refueling outage, expected to begin in Spring 2004, whichever comes first.

There are no regulatory commitments contained within this letter.

If you should have any questions regarding this submittal, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.

J. Alan Price
Site Vice President - Millstone

Enclosure (1)

cc: H. J. Miller, Region I Administrator
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3
Millstone Senior Resident Inspector

A047

Docket No. 50-423
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Enclosure 1

Millstone Power Station, Unit No. 3
Summary of Flaw Evaluation and Relief Request From ASME Code Section XI
Repair and Replacement Requirements for a Flaw in a Service Water System Brazed Joint

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Millstone Power Station Unit No. 3

Summary of Flaw Evaluation and Relief Request From ASME Section XI Repair and Replacement Requirements for a Flaw in a Service Water System Brazed Joint

Unit # 3 System 3326 Date: 6/10/2003 Time: 14:00

1.0 System Engineering

Processing Time: should not exceed 24 hours

1.1 Description of Flaw

The flaw is a failure of a braze joint between 3" monel pipe and a 3" flange in the 'A' Service Water (SW) header. Inspections identified a crack in the braze material of the joint (approximately 180° around). Ultrasonic inspections (UTs) did not find any evidence of pipe wall thinning at the joint. The flaw is located at FW-74-1, located immediately downstream of check valve 3SWP*V705, "ECCS Service Water Supply Check Valve". The flaw is resulting in SW leakage (less than a drop per minute, essentially weeping) from the 3" line.

Piping/component drawing No.: **25212-21011, Sheets 30, 31, 32 (Piping Isometrics)**

Specific component location: **Engineered Safety Features (ESF) Building, El. 4' 6", below the AFW pump cubicle**

P&ID No.: **EM-133B, Service Water / Feed - Chlorination**

1.2 Impracticality of code repair

The flaw is immediately downstream of 3" check valve 3SWP*V705 that is located in a 3" branch connection just off the main 26" 'A' SW supply header. The 3" line supplies cooling water to the 'A' and 'C' recirculation spray coolers which supply cooling water to safety related ventilation coolers, the 'A' Safety Injection Pump cooler and a Reactor Coolant Modular cooler. There is no isolation valve installed between the 26" supply header and the flaw. A code repair would require isolation and draining of one Service Water header and could not be done within the applicable 72 hour LCO. Accordingly, the leaking joint is not isolable to support a code repair.

Isolation using a freeze seal was considered. Physical installation of freeze seal hardware is not possible due to the limited length of 3" piping between the leaking joint and the 26" supply header (less than 12"). An additional concern is that if a freeze seal were installed upstream of the leaking joint, sections of the ice plug could affect the 26" supply header either through blockage or smaller pieces entering the header. Additionally, because the 3" line is restrained by three nearby rigid pipe supports and the 26" header, there are concerns that a freeze seal might induce excessive stresses into the local piping and existing brazed joints by shrinking the length of 3" pipe.

1.3 Description of proposed temporary repair

It has been determined that leakage from a failed brazed joint at this location is acceptable without crediting pressure boundary integrity of the joint itself. Therefore no pressure retaining temporary repair is proposed. Piping and support configuration are credited to maintain leakage to an acceptable level.

With the impracticality of a code repair, the leaking joint will be monitored until a code repair can be performed during the next cold shutdown greater than 30 days or Refueling Outage 3R9 (expected in Spring 2004).

Pending Code repair the following compensatory measures are being performed:

1. A walk down with visual observation of the leakage will be performed once per 12 hour shift.

2. A walk down to qualitatively assess the amount of leakage, defect size and effect on structural integrity will be performed once per week.

3. Additionally, ultrasonic examinations of the affected area are required at least once every 90 days until the joint is repaired.

Currently, housekeeping measures have been installed around the leaking joint to collect the seawater leakage and route it into a floor drain. The housekeeping materials limit the leaking seawater from wetting the piping located below the leaking joint.

1.4 Safety Significance: System Interaction Evaluation

Flooding:

Currently the brazed joint is only weeping, less than a drop per minute. The minor leakage is within the capacity of the existing El. 4' ESF building sump pump. If the leak were to significantly increase, it would be noted in a timely manner via normal operator rounds so that appropriate actions could be taken.

Memo NUCENG-03-057, "Impacts of Operating with a Service Water leak at 3SWP*V705", documents that if the ESF sump pump is not available and the leakage increased to 11 gpm, no safety related instrumentation would be affected by flooding for 6.8 days. In reality, this time period is much shorter than the actual time period that would be available since the leakage rate would start at a much lower rate and potentially increase to 11 gpm. However, even the 6.8 day time period would allow personnel sufficient time to address the water accumulation in the ESF Building. Options for dewatering include re-energizing the sump pump on the 4' level (if the water level is below the motor) or lowering sump pumps down into the ESF Building tunnel via the Terry Turbine cubicle. With respect to radiological concerns, the affected area can be accessed post accident to allow for dewatering. Pre-staged equipment is not necessary due to the time period available to diagnose and correct the water accumulation issue.

Jet spray/ Dripping:

Visual and ultrasonic examinations were performed on June 12, 2003 of the associated piping where dripping was a concern. These examinations found that affects from dripping did not affect the structural integrity of the piping components below the leaking joint.

Spray of adjacent components is not a concern based upon the location of the leak. To address any housekeeping issues caused by the leak, a temporary rubbers shield (not leak tight) was installed around the 3" piping and valve V705. The shield is installed with an opening to an area without electrical or I&C components. In addition, a small rubber curtain with hose has been erected to deflect any spray from the patch opening toward a floor drain should leakage increase.

Loss of flow:

Memo NUCENG-03-057, "Impacts of Operating with a Service Water leak at 3SWP*V705", also documents that a leak caused by the total loss of the brazed joint is acceptable. The analysis assumes that the brazing material at the flaw location is non-existent. Service Water would leak out of the fitting around the entire joint annular gap. The Dominion Brazing Procedure allows a maximum fit up tolerance of 5 mils radial (10 mils diametrical). With the pipe outside diameter being approximately 3.5", this would result in an annulus shaped leakage path area of 0.055 square inches. The memo states that a maximum possible leak rate in the order of 9 to 11 gpm is possible. The 9 gpm leak rate is associated with single SW pump operation. During these conditions, SW flow diversion is an important consideration. The 11 gpm leak rate is associated

with tow (2) SW pumps operating in Train A for long term accident recovery from accident conditions (e.g., spent fuel pool cooling). The 11 gpm leakage is non-limiting with respect to system heat removal capability since the SW header pressure is high.

As part of Memo NUCENG-03-057 assessment, the Service Water flow model developed under calculation no. 96-001 was used to perform a sensitivity analysis for a system leak downstream of valve 3SWP*V705. A 9 gpm leak was specified in a junction downstream of 3SWP*V705. It was determined that the 9 gpm leak may decrease accident flows to ESF Building components, such as 3CCI*E1A, "A" Safety Injection Pump Cooling Heat Exchanger, by 0.8%. Even with this amount of leakage at this location in the system, required flows are delivered to all safety related heat exchangers. Non-ESF Building Service Water System components were determined to be virtually unaffected by the small flow diversion.

For the above reasons, heat exchangers 3HVQ*ACUS1A, ESF Self-Contained Air Conditioning Unit, 3HVQ*ACUS2A, ESF Self-Contained Air Conditioning Unit, 3CCI*E1A, "A" Safety Injection Pump Cooling Heat Exchanger, 3SSP-SCL3, Reactor Coolant Modular Cooler, (and the equipment supported by these components) will be capable of performing their safety functions.

Other interactions: **None**

Failure consequences?

Complete loss of the braze material was evaluated in loss of flow section (see above). Even with a total loss of the brazed material in the joint, the required flows are delivered to all safety related heat exchangers. Non-ESF Building Service Water System components were determined to be essentially unaffected by the small flow diversion.

Impact to safe shutdown capability?

None. As discussed in the following section, the SW system is capable of providing sufficient flow to downstream heat exchangers even postulating that the brazed joint leaks the maximum amount of 11 gpm. Even with this amount of leakage at this location in the system, required flows are delivered to all safety related heat exchangers. Non-ESF Building Service Water System components were determined to be virtually unaffected by the small flow diversion. As such, each heat exchanger will be capable of performing its design function of cooling its associated load. The neighboring SW components were examined and found to be capable of performing their safety function and are structurally acceptable.

1.5 Degradation Mechanism Investigation

Degradation mechanism description:

The flaw is a failure of a braze joint between 3" monel pipe and a 3" flange. Inspections identified a crack in the braze material of the joint (approximately 180° around). Ultrasonic inspections did not find any evidence of pipe wall thinning at the joint. A visual inspection of the piping layout indicates the pipe appears to be slightly angled into the socket of the flange. The piping is located in an area of several rigid pipe supports that may have affected its alignment during installation. With this angle, braze material may not have fully filled the nominal 0.005" gap within the joint. Over time, it appears the seawater seeped through the degraded joint until weeping out the cracked area was observed.

Other systems possibly affected by same mechanism? **Only the SW system has brazed joints in safety related lines. The safety functions which are impacted by the leaking joint are:**

1) SW flow for downstream heat exchangers (listed below) due to loss of inventory through the leaking joint.

2) SW leakage impact on neighboring SW components/piping. Automated Work Order (AWO) M3-03-07594 performed a UT of the 26" 3SWP-026-66-3. The UT found that the 26" SW header was acceptable and the corrosion did not affect the integrity of the piping. This AWO also performed a VT-1 of the bolting to valve 3SWP*V705. Bolting was found acceptable.

3) Heat exchangers 3HVQ*ACUS1A, ESF Self-Contained Air Conditioning Unit which provides cooling for Residual Heat Removal (RHR), Quench Spray System (QSS), and Safety Injection (SIH).

4) Heat exchanger 3HVQ*ACUS2A, ESF Self-Contained Air Conditioning Unit which provides cooling for the Containment Recirculation Spray System (RSS) pumps.

5) Heat exchanger 3CCI*E1A, "A" Safety Injection Pump Cooling Heat Exchanger which provides cooling for SIH lube oil for the "A" Safety Injection pump.

6) Heat exchanger 3SSP-SCL3, Reactor Coolant Modular Cooler, which is also located downstream of the leaking joint, is a non-safety related component

1.6 Augmented Inspection (first one must be completed within 15 days of flaw detection).

Criteria for selection of augmented inspection locations
The following inspections have been completed to date:

1) Initial UTs at 2 locations on the adjacent flange (UT exams of flange itself are limited due to surface condition and material geometry). Results indicated no wall loss in flange or piping within flange socket.

2) Initial ultrasonic examination on adjacent 3" piping (2" of pipe immediately above the flaw, 360° around) was performed and verified no wall loss in the piping.

3) The initial leak was found by visual inspection of the joint following discovery of salt deposits on pipe insulation. Augmented visual inspections of five (5) similar joints in the Unit 3 Service Water system were completed after discovery of leak. The locations chosen were located in the same line as the leaking joint. They were all joints of similar size, geometry, operating history and service conditions. No signs of seawater leakage were located at any of the joints. It is noted that normal walk downs (not augmented) of the Service Water system by Operations and the System Engineer have not identified other locations in the Service Water system with salt residue.

4) Various ultrasonic and visual examinations of piping (3" to 26" joint) located below the leak were performed to verify no degradation to these piping components from the leaking seawater. No degradation of these components was noted (ref. AWO M3-03-07594).

Additional examinations required - specify total number (minimum five) and list specific components and locations

Visual examinations were performed on the following five (5) joints on line 3-SWP-003-67-3 upstream and downstream of check valve 3SWP*V705: joints FW-50, FW-91, FW-92, FW-93, and FW-94.

Discussion of augmented inspection results:

The augmented inspections were done on June 23, 2003 per AWO M3-03-07697, and the inspection found all locations acceptable with no indication of leakage.

2.0 Piping and Engineering Mechanics (PEM)

2.1 Piping Design Details

System:	**Service Water**
Component:	**Braze joint FW-74-1 on line 3-SWP-003-67-3**
Design Code	**ASME III 1971 with Summer 73 Addenda**
Safety code class:	**3**
Piping size and schedule	**3" / 0.219" wall**
Nominal wall thickness:	**0.219" wall**
Material:	**Monel SB 165**
Design pressure:	**100 pisg (63 psig max operating)**
Design/operating temperature:	**Design max 75°F, Design min 33°F**
Code minimum wall thickness (for pressure design)	**0.010" (for Monel piping)**

2.2 Flaw Characterization

Flaw type (through-wall/ non-through-wall, planar/non-planar, single/multiple flaw):

Through-braze leaking type flaw. Limited to braze material. Fitting and pipe are intact. Leak area is limited to annular area between pipe and flange socket.

Flaw sizing (i.e., flaw size, hole size, min wall thickness, adjacent wall thickness, etc.):

The extent of the braze disruption, based upon visual exam, is approximately 180° circumferential. For evaluation purposes the braze joint was assumed to be fully failed. Adjacent pipe material and fitting have no cracking or wastage.

Flaw location on component, any nearby welds:

Braze material between pipe and flange socket, joint FW-74-1

Method of examination:

UT on piping and flange socket, Visual (VT-1) on flaw and adjacent components.

Referenced NDE measurement report:

Ref. Automated Work Order AWO M3-03-07967

2.3 Preliminary flaw evaluation summary

Preliminary (72 hour) operability assessment (RECO) details:

See Section 2.4

Evaluation method used:

See Section 2.4

Limiting flaw size

See Section 2.4

Evaluation reference:

See Section 2.4

2.4 Flaw Evaluation Summary

Method used:

Credit for existing constraint of the piping and supports to retain the pipe end within the fitting socket at the failed braze, such that leakage is limited.

Estimated erosion rate:

N/A

Projected flaw size:

Full circumference of braze material

Assumed service time until permanent repair/replacement:

Approximately 10 months (until refueling outage 3R09, Spring 2004)

Summarize evaluation of design loading conditions:

The piping is designed for deadweight, thermal expansion and seismic loads. Fluid transient loads are not significant. With the braze joint assumed failed, the loads on the joint would be released, except for small lateral constraint loads between the pipe and socket wall. There is no degradation of the pipe or flange socket so these loads would be easily accommodated. An added load of vertical pressure thrust of approximately 740 lbs is imposed on the downstream piping and supports. Because of the multiple nearby supports and the piping stiffness, the pipe end would be constrained to remain within the flange socket even if the braze were to totally fail. Seismic motions at the joint would remain limited by the same configuration of pipe and supports. The leakage flow area would be thereby reduced to the thin annular area between the pipe and flange socket.

The imposed loads on the piping and adjacent supports due to pressure thrust and seismic loads would be within design capacities without reducing normal design margins established in the design basis for the plant. Further details of the evaluation, including a sketch of the piping/support configuration, are included in the referenced technical evaluation.

Millstone Power Station Unit No. 3

Summary of Flaw Evaluation and Relief Request From ASME Section XI Repair and Replacement Requirements for a Flaw in a Service Water System Brazed Joint

Evaluation reference:

Dominion Technical Evaluation M3-EV-03-0014, Rev. 00 (Attached)

3.0 System Engineering (SE)

3.1 Final operability assessment details:

The investigation regarding structural integrity has concluded that all piping structural elements are acceptable except the brazed joint from which the leakage is observed. Because the flaw is located in a brazed joint, the available methodologies to explicitly show structural integrity are not applicable and the Operability Determination assumes a total loss of the braze material.

Based upon nearby pipe supports, the piping will maintain its contiguity and flow capability even though the brazed joint is assumed totally failed.

With a total loss of braze material assumed, flow loss from the joint will not prevent the SW system from supplying cooling to its safety related loads.

3.2 Flaw Monitoring Plan

Walk down frequency (for leak monitoring and temporary repair assessment):

1. A walk down with visual observation of the leakage will be performed once per 12 hour shift.

2. A walk down to qualitatively assess the amount of leakage, defect size and effect on structural integrity will be performed once per week.

Frequency of follow-up NDE (for erosion rate and structural assessment):

Ultrasonic examinations (UTs) of the affected area are required at least once every 90 days until the joint is repaired.

3.3 Additional comments (scope, limitations, and specific considerations)

None

3.4 Exceptions To ASME Code Cases or GL 90-05

Approved ASME Code Cases cannot be invoked because the flaw is in a brazed socket joint. The accepted analysis methods contained in GL 90-05 are also not applicable, so an alternate method of evaluation has been performed. Other requirements of GL 90-05 have been satisfied.

3.5 Relief Request Required ☒ yes ☐ no

Reason

The Non-Code Repair of the leaking brazed joint is not in compliance with ASME Section XI, 1989 Edition, IWA-4000 nor does it meet the accepted analysis methods contained in GL 90-05. Also, NRC approved Code Cases such as N-513 are not applicable because the flaw is in a brazed socket joint.

3.6 References/Inputs

1) Dominion Technical Evaluation M3-EV-03-0014, Rev. 00

2) Piping Isometric Drawing No. 25212-21011, sheet 30

3) Memo NUCENG-03-057, "Impacts of Operating with a Service Water leak at 3SWP*V705"

Prepared By: Thomas A. Moore THOMAS A. MOORE Date: 7/7/03

(System Engineer)

Glenn A. Gardner GLENN A. GARDNER Date: 7/7/03

(Piping and Engineering Mechanics)

Independently Reviewed By: LT DILUNA Date: 7-8-03

Attachment 1

Millstone Power Station, Unit No. 3

Technical Evaluation M3-EV-03-0014
Structural Evaluation of Line 3-SWP-003-67-3 with Leak on Brazed Joint FW-74-1

QA ☒ Non-QA ☐

DB or LB document change required? yes ☐ no ☒

TECHNICAL EVALUATION

for

Structural Evaluation of 3-SWP-003-67-3 with Leak on Brazed Joint FW-74-1

Millstone Unit 3

M3-EV-03-0014

Revision 0

6/25/03

(Total number of pages, including this one = 5)

J. Petrosky		7/2/03
Preparer		Date
G. Gardner		7/2/03
Independent Reviewer		Date
N. Sacco		7/2/03
Engineering Approver		Date

1.0 Purpose

The purpose of the Technical Evaluation is to review the structural integrity of the 3 inch Service Water Line 3-SWP-003-67-3 taking into consideration the degraded brazed joint (FW-74-1) discovered downstream of check valve 3SWP*V705.

2.0 Background

Condition Report CR-03-05506 (Ref. 1) identified salt deposits on insulation near 3SWP*V705 which was evidence of a slow Service Water leak. CR-03-05506 identified a Service Water (SW) leak near valve 3SWP*V705. Upon investigation, a leak was identified at the brazed joint FW-74-1 (reference CR-03-05549). The brazed joint is between the pipe (3-SWP-003-67-3) and the flange just downstream of valve 3SWP* V705. The leak is very slight (less than a drop per 5 minutes, essentially weeping). This component is located in the ESF Building, 4ft. elevation under the turbine driven auxiliary feedwater pump cubicle. The extent of the brazed joint degradation has been investigated and it has been determined that the degradation is limited to the brazed joint. Inspections identified a crack in the braze on joint FW-74-1 but did not find evidence of pipe wall thinning or degradation of other brazed joints on this line. Operability Determination MP3-042-03 (Reference 2) documented the basis for system operability based upon:

- flaw evaluation (References 3 and 4)
- system flow tolerance of maximum leakage with postulated brazed joint failure (Reference 5)
- review of flooding and spray effects
- structural integrity review

The system orientation of a short pipe stub connected to a 26 inch header prohibits an on-line Code repair due to inability to mechanically isolate the flaw or install a freeze seal. A Relief Request is being processed to seek NRC concurrence with deferral of the Code repair until 3R09. Section 3.0 documents the technical facts that justify interim structural integrity acceptability for Service Water Line 3-SWP-003-67-3. A summary of applicable piping design data is summarized below:

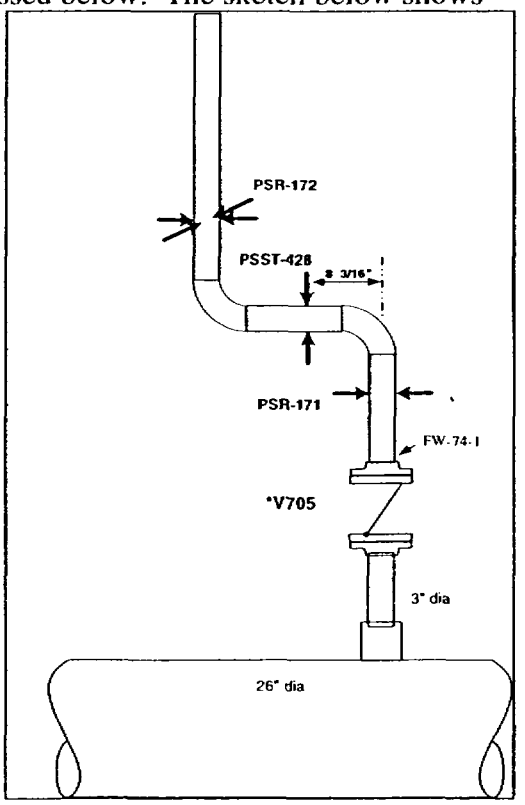
System	Service Water
Line	3-SWP-003-67-3
Design Code	ASME III 1971 with Summer 73 Addenda
Safety Code Class	Class 3
Nominal Wall Thickness	0.219
Pipe Material	Monel SB 165,
Flange Material	Silicon Bronze SB61
Pressure	Design 100 psi, Max Operating 63 psi
Temperature	Design Max 75 deg F, Design Min 33 deg F.
Code Min Wall (Pressure)	0.01 in

3.0 Discussion

The Millstone Unit Three Technical Requirements Manual (Reference 17) defines structural integrity as "the ability to withstand specified loading, with an acceptable margin, without collapse, rupture, brittle fracture, or unstable flaw growth". Under TRM 3.4.10, the structural integrity of an ASME component is determined in accordance with the ASME Section XI Code, approved Code Cases or regulatory approved methods of evaluation. The degraded piping component in this instance is the brazed joint, which normally provides local pressure boundary leak-tightness and contributes to the overall acceptable structural behavior of the piping running from the header through the check valve and out of the room to its connections with system components requiring cooling water flow. Because the degradation is located in a brazed joint, the accepted methodologies to explicitly show structural integrity are not applicable.

With direct methods not applicable, the approach of this evaluation is to assume the braze is fully disrupted, and then determine the structural and pressure boundary consequences of the joint failure on the overall piping functional performance. An engineering review of the applicable technical documents and analyses that qualify the existing configuration (References 6 –15) concludes that the current piping and support configuration, with the presence of the FW-74-1 brazed joint flaw, has adequate structural integrity, with typical Code conservatism and margin, to ensure the required cooling flow is provided to safety related components.

For the purpose of analyzing structural capacity of the associated components, this evaluation assumes the total loss of the leaking brazed joint. In this case, the configuration of piping and supports is such that the piping is constrained to stay within the fitting socket, and the leakage flow is limited by the small annular area between the pipe and fitting socket. At full design pressure of 100 psig the pressure thrust attempting to separate the joint would be approximately 740 lbs. Seismic and other design loads are also considered as discussed below. The sketch below shows the basic configuration under consideration.



The piping is restrained in the vertical direction by hanger strut PSST428 that is offset only 8.2 inches from the brazed joint. The strut has essentially a zero gap. Therefore, vertical deflection of the pipe out of the braze socket is minimal compared to the approximately ½" engagement. Per Reference 14, vertical load capacity of PSST 428 is well in excess of the 2338 lb. original design value and provides sufficient margin for the maximum calculated load of 2011 lb per Reference 14. This design load includes seismic, thermal and deadloads. With the brazed joint disrupted, the thermal expansion load is minimal. Therefore the additional thrust load is within the capability of the support. Similarly, N-S pipe support PSR171, located 14 inches above FW-74-1, has a design capacity of 1988 lb. and a maximum calculated load of 430 lb per Reference 12. Downstream a two way lateral support, located approximately 4 feet away from FW-74-1, has significant design capacity in the pipe strap

(Reference 13) and tube steel frame (Reference 15) to accommodate increased load postulated from the failure of FW-74-1. Valve 3SWP*V705 is anchored by the 26" header pipe line 3-SWP-026-66-3 that is also well restrained. The remaining stub of pipe to the header pipe is short so no excessive bending moments will be generated even in a seismic event. Thus, because the line and valve are rigidly supported, the pipe can not disengage from the flange socket, even with full pressure and seismic loads applied under accident conditions. The monel pipe retains its integrity with no degradation (Reference 16), and the flange socket hub retains integrity and can be credited for side loading at the piping interface. There is only a thin annular area (associated with initial fit-up clearances) between the pipe and flange socket so leakage flow would be minimal. The predicted leakage flow has been determined to be acceptable with regard to system performance, Reference 5. Therefore it is concluded the piping will maintain its structural contiguity and flow capability even though the brazed joint is assumed totally failed and leakage will occur.

Although not directly invoked, the above evaluation is conceptually similar to Code Case N-523, Mechanical Clamping Devices for Class 2 and 3 Piping, which permits the use of mechanical clamping devices to control leakage through the pressure boundary and maintain an acceptable level of structural integrity of piping. The clamping device limits leakage by preventing separation of piping components. For the Millstone brazed joint, separation is prevented by the piping configuration and the adjacent pipe supports.

The above conclusions regarding structural integrity and functional performance of the piping system are for a limited duration, not to extend beyond the next refueling outage. The evaluation is also premised on periodic inspections of the piping as required by the Operability Determination, Reference 2. Because the evaluation has used methodology not approved by the NRC, a relief request submittal is required in accordance with Generic Letter 90-05 and Generic Letter 91-18 Rev. 1.

4.0 Safety Significance

There are no adverse safety consequences resulting from the brazed joint leak based on the following. The Service Water supports adjacent to the leaking joint have adequate capacity to maintain the system structural and hydraulic performance function of 3-SWP-003-67-3 and downstream piping. Apart from the degraded joint leakage, adequate structural design margins have been maintained. The SW system is capable of providing sufficient flow to downstream heat exchangers even when postulating complete failure of brazed joint FW-74-1. Heat exchangers 3HVQ*ACUS1A (the ESF Self-Contained Air Conditioning Unit), 3HVQ*ACUS2A (the ESF Self-Contained Air Conditioning Unit), 3CCI*E1A (the "A" Safety Injection Pump Cooling Heat Exchanger), and 3SSP-SCL3 (the Reactor Coolant Modular Cooler), are capable of performing their safety functions and are OPERABLE per Reference 2. A visual inspection of five similarly configured brazed joints on this line found no evidence of leakage or damage (Reference 16). The condition is being monitored under the corrective action program under the requirements of the operability determination compensatory actions (Reference 2).

5.0 Conclusion

Service Water brazed joint FW-74-1 between pipe 3-SWP-003-67-3 and the flange just downstream of valve 3SWP* V705 is leaking slowly at the braze. This condition does not conform with TRM Section 3.4.10 requirements (Reference 17), therefore the brazed joint does not maintain structural integrity. However the three adjacent pipe supports and the connection to the 26 inch Service Water header provide a rigid support system with adequate capacity to maintain the structural and hydraulic performance of line 3-SWP-003-67-3. Therefore this evaluation supports the conclusion of operability of the remainder of the piping system and its attached components. The Code repair on FW-74-1 may therefore be deferred until 3RFO9, consistent with the guidance of Generic Letter 90-05 and Generic Letter 91-18 Rev. 1.

6.0 References

1. Leakage Identification Condition Report CR-03-05506
2. Operability Determination MP3-042-03
3. Flaw Evaluation Work Order AWO M3-03-07594
4. Flaw Evaluation Condition Report CR-03-05591
5. Memo NUCENG-03-057, Impacts of Operating with a Service Water leak at 3SWP*V705
6. Drawing 25212-26933, P&ID EM-133B, Rev. 39
7. Drawing 25212-21011 Sheets 30, 31,32, Piping Detail, Rev. 13, 13, 12
8 Drawing 25212-22657-54A, PSR171 Pipe Support Detail, Rev. 6
9 Drawing 25212-22657-55A, PSR172 Pipe Support Detail, Rev. 2
10 Drawing 25212-22657-120A, PSST428 Pipe Support Detail, Rev. 1
11 Calculation NP(B)-X1914, Service Water Piping, ESF Building, Rev. 4
12 Calculation NP-Z019A-171, Design of Pipe Support 3-SWP-4-PSR171, Rev. 11
13 Calculation NP-Z019A-172, Design of Pipe Support 3-SWP-4-PSR172, Rev. 8
14 Calculation NP-Z019A-428, Design of Pipe Support 3-SWP-4-PSST428, Rev. 5
15 Calculation NP-Z019A-155, Design of Pipe Support 3-SWP-4-PSR155, Rev. 8
16 Work Order AWO M3-03-07967, NDE of Service Water Piping
17 Millstone Unit Three Technical Requirements Manual (TRM) , Release No. 007