

PRIORITY 1
(ACCELERATED RIDS PROCESSING)

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9410120320 DOC. DATE: 94/10/06 NOTARIZED: NO DOCKET #
 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
 AUTH. NAME AUTHOR AFFILIATION
 SAGER, D.A. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION
 Document Control Branch (Document Control Desk)

SUBJECT: Requests approval of Interim Relief Request 16 re repair requirements for Class 3 piping.

DISTRIBUTION CODE: A047D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 20
 TITLE: OR Submittal: Inservice/Testing/Relief from ASME Code - GL-89-04

NOTES:

	RECIPIENT		COPIES			RECIPIENT		COPIES	
	ID CODE/NAME		LTR	ENCL		ID CODE/NAME		LTR	ENCL
	PD2-2 LA		1	0		PD2-2 PD		1	1
	NORRIS, J		2	2					
INTERNAL:	ACRS		6	6		AEOD/SPD/RAB		1	1
	FILE CENTER-01		1	1		NRR/DE/EMCB		1	1
	NRR/DE/EMEB		1	1		NUDOCS-ABSTRACT		1	1
	OC/LFDCB		1	0		OGC/HDS3		1	0
	RES/DSIR/EIB		1	1					
EXTERNAL:	EG&G BROWN, B		1	1		EG&G RANSOME, C		1	1
	NOAC		1	1		NRC PDR		1	1

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 504-2083) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTR 22 ENCL 19

P
R
I
O
R
I
T
Y

1

D
O
C
U
M
E
N
T



October 6, 1994

L-94-253
10 CFR 50.4
10 CFR 50.55a

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

RE: St. Lucie Unit 1
Docket No. 50-335
In-Service-Inspection Plan
Second Ten-Year Interval
Interim Relief Request 16 - Repair
Requirements for Class 3 Piping

Pursuant to 10 CFR 50.55a(a)(3) and 50.55a(g)(5)(iii), Florida Power and Light Company (FPL) requests approval of interim relief request 16 "Repair Requirements for Class 3 Piping." Approval is requested for a temporary non code repair to correct through wall leakage on piping located on the intake cooling water (ICW) outlet headers downstream of the Unit 1 component cooling water (CCW) heat exchangers. Attachment 1 is interim Relief Request 16. Attachment 2 is the interim engineering disposition of pressure tap PX-21-8B. Attachment 3 is the interim engineering disposition of pressure tap PX-21-8A. Attachment 4 is the interim engineering disposition of line I-30"-CW-73.

FPL determined that an ASME Section XI Code repair is not practical in that FPL is considering several alternatives for a permanent code repair that include potential design modifications. It is not expected that the final repair will be engineered before the unit commences its scheduled refueling outage on October 31, 1994. In addition, as discussed in the relief request, the Technical Specification allowed outage time of 72 hours for the affected headers may be insufficient to accomplish a code repair. A plant shutdown and cooldown with unnecessary cycling of facility systems and components would be required to perform a code repair of the piping. A code repair/replacement will be accomplished during the upcoming Unit 1 refueling outage. The proposed alternatives provide an acceptable level of quality and safety, and compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Please contact us if there are any questions about this submittal.

Very truly yours,

D. A. Sager
Vice President
St. Lucie Plant

120132

DAS/GRM

cc: Stewart D. Ebnetter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant



1000-117

St. Lucie Unit 1
Docket No. 50-335
Inservice Inspection Plan
Second Ten Year Interval
Relief Request 16 - Repair Requirements For Class 3 Piping

ATTACHMENT 1

SECOND INSPECTION INTERVAL
ST. LUCIE UNIT 1
RELIEF REQUEST NUMBER 16

A. COMPONENT IDENTIFICATION

Class: Quality Group C Class 3

Identification of Components: Intake Cooling Water Piping
I-30"-CW-77, I-30-CW-73 & I-30-CW-76

Description of Components:

- 1) 3/4" branch connection 316 SS to Root Valve SH-21250 for instrument tap connection PX 21-8B off line # I-30"-CW-77.
- 2) 3/4" nipple 316 SS to Root Valve SH-21203 for instrument tap connection PX 21-8A off line # I-30"-CW-76.
- 3) Line I-30"-CW-73 adjacent to 1" branch connection to FIS-21-9A.

B. EXAMINATION REQUIREMENTS

Examination Category: D-A
Exam Item: D1.10: Visual, VT-2
Examination Requirement: Pressure Retaining Boundary, Each Inspection Period

C. RELIEF REQUESTED

Interim relief is requested from the Repair and/or Replacement requirements of ASME Boiler and Pressure Vessel Code, Section XI, 1983 Edition through the Summer 1983 addenda, Articles IWA / IWC-4000 and 7000 respectively. This relief proposes use of a temporary non-code repair for the components described until a code repair or replacement can be made during the upcoming refueling outage, which is currently scheduled to begin October 31, 1994.

D. BASIS FOR RELIEF:

Florida Power & Light Company (FPL) has determined, based on the justification stated below, that the shutdown of the operating unit would be impractical for the sole purpose of making an ASME Code repair / replacement, and provide an undue hardship on FPL, without compensating increase in the quality or safety of the plant for the following reasons:

**SECOND INSPECTION INTERVAL
ST. LUCIE UNIT 1
RELIEF REQUEST NUMBER 16**

1. The 3/4" branch connection to instrument tap connection PX 21-8B off line # I-30"-CW-77 was completely severed at and adjacent to the toe of the pipe to attaching sockolet weld.
 - a. A permanent repair or replacement would require removal of the 1B ICW header from service, draining the affected portion of the line, removing the remaining weld, performing the replacement weld, filling and venting of the header and completion of the Inservice leak test.
 - b. Since the method of failure and subsequent root cause determination indicates that the most probable cause of failure is vibration, a design modification to address the cause of failure may also be required. The modifications being investigated may include the addition of a support or installation of a permanent plug at the location of the instrument tap connection. It is not reasonable to expect that this work could be completed within 72 hours permitted by Technical Specification 3/4.7.4.
 - c. The temporary repair method for controlling leakage, is the installation of a plug in the opening. The plug is held in place by friction or clamping device. The weight of this item is less than the pipe and valve assembly it replaces, therefore the installation of the temporary repair will not affect the piping system. The plug will remain installed as a non-code repair until a permanent repair is performed, which will be during the upcoming refueling outage.
 - d. Since the failure of this 3/4" line would not create a safety concern (see item 4), this temporary repair serves as a housekeeping provision only. Therefore, it is acceptable if this temporary repair is not completely leak tight and if leakage occurs with the plug installed.

2. The 3/4" nipple to instrument tap connection PX 21-8A off line # I-30"-CW-76 exhibits through wall leakage at the toe of the pipe to the attaching sockolet weld. The area has evidence of external pitting and a crack approximately 5/8" long.
 - a. A permanent repair or replacement would require removal of the 1A ICW header from service, draining the affected portion of the line, removing the remaining weld, performing the replacement weld, filling and venting of the header and completion of the Inservice leak test.
 - b. Since the method of failure and subsequent root cause determination indicates that the most probable cause of failure is vibration, a design modification to address the cause of failure may also be required. The modifications being investigated may include the addition of a support or installation of a permanent plug at the location of the instrument tap connection. It is not reasonable to expect that this work could be completed within 72 hours permitted by Technical Specification 3/4.7.4.

SECOND INSPECTION INTERVAL
ST. LUCIE UNIT 1
RELIEF REQUEST NUMBER 16

- c. Since leakage at this time is very minimal, approximately 5 drops per minute, a temporary repair method for controlling leakage is not required at this time. If the leakage rate increases, a soft resilient patch can be installed over the leak area. The patch would be held in place with a clamping device. Should complete failure of the 3/4" line occur, an alternate method of temporary repair would be the installation of plug as previously discussed above. The patch or plug will remain installed as a non-code repair until a permanent repair is performed, which will be during the upcoming refueling outage.
 - d. Because failure of this 3/4" line would not create a safety concern (see item 4), a temporary repair serves as a housekeeping provision only. Therefore, it is acceptable if this temporary repair is not completely leak tight and if leakage occurs with the a patch or plug installed.
3. A through wall leak in the 30" header adjacent to a 1" branch connection to FIS-21-9A of line # I-30"-CW-73 was discovered in a "patch plate". The plate which is 4.5" square, is bounded on one side by a 30" pipe support clamp. The hole appears to have developed from an isolated erosion / corrosion cell.
- a. A permanent repair or replacement would require removal of the 1A ICW header from service, draining the affected portion of the line, removing a portion of the patch plate, performing a replacement weld, and application of an epoxy coating to the internal surface of the piping for corrosion protection. After the repair, filling and venting of the header and completion of the Inservice leak test would also be required. It is not reasonable to expect that this work could be completed within 72 hours permitted by Technical Specification 3/4.7.4.
 - b. The method of failure and subsequent ultrasonic inspection (UT) indicates that the most probable cause of failure is localized erosion / corrosion. Based on low system pressure and local UT data, catastrophic failure is considered unlikely. Additionally, the hole is not expected to enlarge to an unacceptable size until a permanent repair can be made, which is scheduled for the upcoming refueling outage.
 - c. The temporary repair method for controlling leakage, is the installation of a plug or patch in the opening or installation of a device to divert leakage into a drain . The plug is held in place by friction or clamping device. The weight of this item is insignificant when compared to the weight of the 30" header, therefore installation of these temporary measures will not adversely affect the piping system. The method of leakage control will remain installed as a non-code repair until a permanent repair is performed.

SECOND INSPECTION INTERVAL
ST. LUCIE UNIT 1
RELIEF REQUEST NUMBER 16

- d. Since the failure of this 3/4" line would not create a safety concern (see item 4), this temporary repair serves as a housekeeping provision only. Therefore, it is acceptable if this temporary repair is not completely leak tight.
4. The safety function of both 30" headers downstream of the heat exchangers is to maintain a pressure boundary following a seismic event. It has been determined that the leakage identified does not affect this safety function. Since both lines are located in the CCW pit, drainage is sufficient to ensure that failure of these lines would not present a flooding concern. No safety related equipment would be affected by resultant spray if the leakage rate increases to worst case. Therefore a potential operability concern does not exist in either case.
- E. ALTERNATIVE EXAMINATIONS OR TESTS:
1. Augmented inspections of several additional susceptible locations has been performed. Where geometry of the locations prevented a volumetric inspection, visual inspections were performed for evidence of leakage.
 2. Weekly inspections will be performed of the locations involved to ensure that adequate housekeeping measures are maintained for any increased leakage.
- F. IMPLEMENTATION SCHEDULE:
- These issues are considered temporary and are considered by FPL to be an intermediate measure. The locations will be permanently repaired during the Fall 1994 refueling outage.

St. Lucie Unit 1
Docket No. 50-335
Inservice Inspection Plan
Second Ten Year Interval
Relief Request 16 - Repair Requirements For Class 3 Piping

ATTACHMENT 2

Interim Engineering Disposition:

Background:

During plant operations on 9/9/94 a leak was discovered down stream of valve TCV-14-4B in the 3/4" branch connection to PX-21-8B. The 3/4" line for PX-21-8B was completely severed at the toe of the pipe to sockolet attaching weld.

Operability:

The broken 3/4" line to isolation valve I-SH-21250 and connection for PX 21-8B is Quality Group C and Seismic Class I. However, PX 21-8B does not perform a safety function. The integrity of line I-30"-CW-77 is not affected by this break since the break is downstream of the sockolet, which is considered a reinforced opening.

The broken line is downstream of the 1B CCW heat exchanger and I-TCV 14-4B, and therefore has no negative impact on the heat removal capability of the heat exchanger. The ICW flow through the broken line is estimated to be less than 100 gpm which is less than 1% of the design ICW pump flow rate (~14,000 gpm). The safety function of the line I-30"-CW-77 downstream of the heat exchanger is to maintain a pressure boundary following a seismic event. This safety function is not affected as a result of the 3/4" line break. Also, since the broken 3/4" line is located in the CCW pit, and the drainage of the pit is sufficient to handle the leakage volume, no flooding concern exists. Therefore, a potential operability concern does not exist.

Disposition:

Perform temporary non-code repair in accordance with USNRC Generic Letter 90-05 for moderate energy Class 3 lines.

Note: During augmented inspections a leak was noted in the 1A ICW header 3/4" branch connection for PX-21-8A. PX-21-8A is located down stream of TCV 14-4A with a very similar configuration and operating condition as the failed line to PX-21-8B. This leak will be dispositioned with PX-21-8B and should be coordinated for inclusion in the USNRC Relief Request.

Flaw Characterization And Root Cause Analysis:

The 3/4" line for PX-21-8B was completely severed at and adjacent to the toe of the pipe to sockolet attaching weld. The failed section of piping was forwarded to the CSI/JPN Metallurgical Lab for analysis. The analysis results indicate the failure mechanism

L-94-254
Attachment 2

was high cycle fatigue (Met Lab Report MET 94-198). Based on the failure mechanism, the existing flaw would be characterized as a crack originating on the OD surface of the pipe at or adjacent to the toe of the attaching weld. During operation this crack propagated transverse to the pipe axis (circumferentially & through the pipe wall), resulting in through wall leakage and failure.

The most probable root cause of the failure is vibration induced by throttling of valve TCV-14-4B.

Flaw Evaluation:

Since the flaw propagated to the point of line failure, flaw evaluation and failure prediction is not applicable. The main header and branch connections in this location are stainless steel material and the integrity of the sockolet and attachment weld to the 30" header is unaffected. Erosion/corrosion or structural integrity of the 1B ICW header is not affected. Ultrasonic or radiographic testing on this configuration in the field would not provide meaningful information; thus further NDE is not required.

The failure of this piping did not create any flow-rate, flooding or spray conditions that would prevent any plant components from performing their Safety Functions.

Method Of Permanent Repair:

Permanent repair may require a design modification to address root cause and prevent recurrence. Implementation will require removal of the 1B ICW header from service, draining the affected line, removing the remaining weld, performing a replacement weld, filling and venting of the header, and completing the in-service leak check. In addition a new support may be required. It is not reasonable to expect that this work could be completed within the 72 hours permitted by Technical Specification 3/4.7.4. The installation of a temporary Non-Code repair is recommended until a permanent repair can be installed during an outage of sufficient duration.

Modifications to the existing piping configuration or addition of supports will be provided in the final disposition.

Method Of Temporary Non-Code Repair/Compensatory Action:

The temporary method for controlling the leakage is the installation of a plug in the opening. The plug is held in place by friction or clamping device. The weight of these items is less than the pipe and valve assembly it replaces; therefore the installation of the temporary repair will not adversely affect the piping system. This plug will remain installed as a non-code

L-94-254
Attachment 2

repair until a permanent repair is performed, which must be completed no later than the next scheduled outage exceeding 30 days or the next refueling outage.

The materials of construction for the 30" main header and branch connections in this section of piping are stainless steel, the sockolet is still attached to the header and stainless steel material is resistant to erosion/corrosion in flowing sea water. Therefore, the structural integrity of the 1B header is maintained.

Since the failure of this 3/4" line would not create a safety concern, this temporary repair serves as a housekeeping provision only. Therefore, it is acceptable if this temporary repair is not completely leak tight and if leakage occurs with the plug installed.

Augmented Inspection:

Five (5) additional susceptible locations upstream of the failure were visually inspected for signs of leakage (QCR# QC 94-067) as required by Generic letter 90-05. The inspection was limited to the connection between the branch connection piping and the threadolet/sockolet attached to the 1B 30" header. One (1) location, connection for PI-21-24A, exhibited signs of minor leakage (rust trails and small droplet of water). This location consists of a threadolet welded to the 1B header and a threaded pipe nipple screwed into the threadolet. The leakage was evaluated to be mechanical leakage through the threaded connection. A PWO has been initiated to correct the leakage during the 1994 refueling outage.

Required Actions:

1. Perform a temporary non-code repair per the method described above.
2. Perform weekly inspections of the temporary repair to insure that adequate house keeping measures are maintained for any increased leakage.
3. Return to Nuclear Engineering for final disposition.

St. Lucie Unit 1
Docket No. 50-335
Inservice Inspection Plan
Second Ten Year Interval
Relief Request 16 - Repair Requirements For Class 3 Piping

ATTACHMENT 3

L-94-254
Attachment 3

Interim Engineering Disposition:

Background:

During augmented inspection of susceptible locations for attachment 2, a through wall leak was discovered down stream of valve TCV 14-4A in the 3/4" branch connection to PX-21-8A. The leak is at the toe of the 3/4" pipe nipple to sockolet attaching weld on the west side.

Operability:

The inspection of the affected line was part of an augmented inspection done in accordance with Generic Letter 90-05 based on a similar line failure downstream of the B CCW heat exchanger.

The affected 3/4" line is a test connection for PX 21-8A. The pressure instrument PX 21-8A is not permanently installed. Isolation is provided by root isolation valve I-SH-21203. PX 21-8A does not perform a safety function. The integrity of line I-30"-CW-76 is not affected by this through wall leak since the leak is downstream of the sockolet, which is considered a reinforced opening.

The affected line is downstream of the 1A CCW heat exchanger and I-TCV 14-4A, and therefore has no negative impact on the heat removal capability of the heat exchanger. The ICW flow rate through the crack is minimal (measured in drops per minute). Assuming complete failure of the 3/4" line (as occurred on PX 21-8B), the estimated leakage of ICW would be less than 100 gpm. 100 gpm is less than 1% of the design ICW pump flow rate (~14,000 gpm). The safety function of the line I-30"-CW-76 downstream of the heat exchanger is to maintain a pressure boundary following a seismic event. This safety function is not affected if complete failure of the 3/4" line occurs. Also, since the broken 3/4" line is located in the CCW pit, and the drainage of the pit is sufficient to handle the leakage volume, no flooding concern exists. No safety related equipment will be affected by resultant spray if the leakage rate increases to worst case. Therefore, a potential operability concern does not exist.

Disposition:

Perform Temporary Non-Code Repair in accordance with USNRC Generic Letter 90-05 for moderate energy Class 3 lines.

Note: This leak was discovered during augmented inspection under Attachment 2 and should be coordinated for inclusion in the USNRC Relief Request.

L-94-254
Attachment 3

Flaw Characterization And Root Cause Analysis:

The 3/4" line for PX-21-8A exhibits through wall leakage at the toe of the pipe to sockolet attaching weld on the west side. The area has evidence of external pitting and a crack approximately 5/8" long. Based on the failure mechanism (see note) for PX-21-8B and a similar location down stream of a TCV, the existing flaw would be characterized as a crack originating on the OD surface of the pipe at or adjacent to the toe of the attaching weld. During operation this crack would propagate transverse (circumferentially & through the pipe wall), resulting in through wall leakage and failure. In addition, due to the evidence of pitting, atmospheric corrosion due to a salt laden atmosphere may be a contributor to the crack initiation point.

Note: The failed section of piping from PX-21-8B was forwarded to the CSI/JPN Met Lab for analysis. The results of the lab analysis indicate the failure mechanism was high cycle fatigue (Met Lab Report MET 94-198).

Since the location of the leak is down stream of TCV-14-4A, the most probable root cause of the subject failure is changes in flow characteristics induced by throttling of valve TCV-14-4A resulting in vibration.

Flaw Evaluation:

The flaw will propagate transverse to the pipe axis and over time may lead to complete line failure. Crack propagation is dependent on frequency and stress intensity. Since the size (length) of the flaw exceeds 15% of the circumference and is through wall, propagation evaluation and predicting failure is not applicable. The main header and branch connections in this location are stainless steel material and the sockolet remains attached to the 30" header. Erosion/corrosion rates or structural integrity of the 1A ICW header is not affected. Ultrasonic or radiographic testing on this configuration in the field would not provide meaningful information; thus further NDE will not be performed.

The failure of this piping did not create any flow-rate, flooding or spray conditions that would prevent any plant components from performing their Safety Functions.

Method Of Permanent Repair:

Permanently repairing the affected line will require draining a large section of the 1A ICW header, removing the remaining weld, performing a replacement weld, filling and venting of the header, and completing the in-service leak check. In addition a new support may be required. It is not reasonable to expect that this work could be completed within the 72 hours permitted by Technical Specification 3/4.7.4. The installation of a temporary Non-Code

L-94-254
Attachment 3

repair is recommended until a permanent repair can be installed during an outage of sufficient duration.

Modifications to the existing piping configuration or addition of supports will be provided in the final disposition.

Method Of Temporary Non-Code Repair/Compensatory Action:

The leakage to this point is very small, approximately 5 drops per min, and a temporary method for controlling the leakage is not required at this time. However, if the leakage rate increases, install a soft resilient patch over the leak area. The patch will be held in place by a clamping device (such as banding). In the event that the propagation of the crack results in complete failure of the 3/4" line, than a plug can be installed in the opening. The plug will be held in place by friction or clamping device. The weight of these items is minimal when compared to the weight of the 30" spool.; therefore the installation of the temporary repair will not adversely affect the piping system. This temporary patch (or plug) will remain installed as a non-code repair until a permanent repair is performed, which must be completed no later than the next scheduled outage exceeding 30 days or the next refueling outage.

Method Of Temporary Non-Code Repair/Compensatory Action Continued:

The materials of construction for the 30" main header and branch connections in this section of piping are stainless steel, the sockolet is still attached to the header and stainless steel material is resistant to erosion/corrosion in flowing sea water. Therefore, the structural integrity of the 1A header is maintained.

Since the failure of this line would not create a safety concern, this temporary repair serves as a housekeeping provision only. Therefore, it is acceptable if this temporary repair is not completely leak tight and if leakage occurs with the patch or plug installed.

Augmented Inspection:

Five (5) additional susceptible locations upstream of the failure were visually inspected for signs of leakage (QCR# QC 94-067). The inspection was limited to the connection between the branch connection piping and the threadolet/sockolet attached to the 1A 30" header. One (1) location, connection for PDIS 21-9A, exhibited signs of minor leakage (rust trails). This location consists of a threadolet welded to the 1A header and a threaded pipe nipple screwed into the threadolet. The leakage was evaluated to be mechanical leakage through the threaded connection. A PWO has been initiated to correct the leakage during the 1994 refueling outage.

L-94-254
Attachment 3

Required Actions:

1. Perform a temporary non-code repair per the method described above.
2. Perform weekly inspections of the temporary repair to insure that adequate house keeping measures are maintained for any increased leakage.
3. Return to Nuclear Engineering for final disposition.

St. Lucie Unit 1
Docket No. 50-335
Inservice Inspection Plan
Second Ten Year Interval
Relief Request 16 - Repair Requirements For Class 3 Piping

ATTACHMENT 4

Interim Engineering Disposition:

Background:

During plant operations on 9/26/94, a leak was discovered in line I-30"-CW-73 down stream of the 1A CCW heat exchanger. The location of the leak is at the bottom of the 1A 30" header adjacent to the 1" branch connection to FIS-21-9A (down stream side).

Operability:

The affected ICW header (I-30"-CW-73) and 1" instrument line is Quality Group C and Seismic Class I (ref: 8770-G-082 sh 1) through the root isolation valve. PCM 339-192 changed the quality group classification and seismic class for eight instrument sensing lines, including FIS 21-9A, from Quality Group C to Quality Group D after the sensing line root valves. The seismic class for these instrument lines were changed from Seismic Class 1 to non-seismic after the first anchor downstream of the instrument root valve. The PC/M identified coincident failure of the eight instrument lines attached to the ICW headers in the CCW pit would not adversely affect the safety functions of the ICW and CCW systems.

Although root cause evaluation has not been completed, UT of the area identified the failure is most likely a corrosion pit. The assessable areas adjacent to the pit identified wall thicknesses well above minimum wall and catastrophic failure is not anticipated.

Therefore, the through wall failure is not anticipated to create any flow-rate, flooding, or spray conditions that would prevent any plant components from performing their safety functions.

Since the line is located in the CCW pit, drainage is sufficient to ensure that the leakage from the 1A header would not present a flooding concern. Therefore, a leak from this line would not affect the ability of the CCW Heat Exchanger to perform its safety function. Thus, a potential operability concern does not exist.

Disposition:

Perform temporary non-code repair in accordance with USNRC Generic Letter 90-05 for moderate energy Class 3 lines.

Note: Leaks have been identified at two (2) other locations as follows; 1) 1A ICW header 3/4" branch connection for PX-21-8A and 2) 1B ICW header branch connection for PX-21-8B. Consideration should be given to coordinate inclusion of all three (3) leaking locations into one USNRC Relief Request.

Flaw Characterization And Root Cause Analysis:

The source of the leakage is a hole in the 30" header adjacent to the 1" branch connection to FIS-21-9A (downstream connection). The half coupling (1" branch connection to FIS-21-9A) is located in a patch plate approximately 4.5" square and is bounded on one side by a 30" pipe clamp (approximately 1-1/2" of the patch plate is under clamp) for restraint CW-1000-14. The hole appears to be rounded irregularly with slight elongation on one side. The size of the hole is determined to be approximately 1/4" in diameter. Ultrasonic thickness inspection of the area adjacent to the plate weld provided adequate wall thickness (Ref; JPN-CSI-94-145). The resultant UT thickness measurements indicate that there is not an overall pipe wall thinning concern and the wall thinning is concentrated to the identified area. Due to the erosion/corrosion effect of flowing sea water, the hole will continue to enlarge at a unspecified erosion rate. The erosion rate will slow as the thicker adjacent wall thickness is encroached.

Although the root cause cannot be conclusively determined until the system is removed from service and analysis performed, the most probable failure mechanism is erosion/corrosion.

Flaw Evaluation:

The use of the wall thinning evaluation approach addressed in Code Case 480 is not completely applicable due to the hole location and configuration of adjacent components (pipe clamp and 1" half coupling). The hole appears to have developed from an isolated erosion/corrosion cell. Based on low system pressure and local UT data, catastrophic failure is considered unlikely. In addition, the hole is not anticipated to enlarge to an unacceptable size (STD M-006, appendix C, R1 - interpellated 2-3/8" diameter) during the time remaining (approximately 35 days) until a permanent repair can be implemented. Therefore, this flaw will not affect the structural integrity of the 1A header.

The failure of this piping (hole increasing in size) would not create any flow-rate, flooding or spray conditions that would prevent any plant components from performing their Safety Functions.

Method Of Permanent Repair:

Permanent repair may require a design modification to address root cause and prevent recurrence. Implementation will require removal of the 1A ICW header from service, draining the affected line, removing a portion of the piping (patch plate) and half coupling, performing a replacement weld on the patch plate and half coupling, application of internal protective coatings, filling and venting of the header, and completing the in-service leak check. It is not reasonable to expect that this work could be completed

L-94-254
Attachment 4

within the 72 hours permitted by Technical Specification 3/4.7.4. The installation of a temporary Non-Code repair is recommended until a permanent repair can be installed during the next scheduled outage.

Modifications to the existing piping configuration (material changes) will be provided in the final disposition.

Method Of Temporary Non-Code Repair/Compensatory Action:

Controlling of the leakage may be by; 1) Installation of a plug in, or a patch over, the opening or 2) Install a diversion device (funnel and hose) to direct the leakage to the drain. The plug or patch, in 1 above, is held in place by a clamping device. The weight of these items, in 1 or 2 above are insignificant when compared to the weight of the 1A 30" header; therefore the installation of the temporary repair or diversion device will not adversely affect the piping system. The method of leakage control (plug or patch or funnel) will remain installed as a non-code repair until a permanent Code repair is performed, which must be completed no later than the next scheduled outage exceeding 30 days or the next refueling outage.

The materials of construction for the 30" main header and branch connections in this section of piping are carbon steel with internal lining (cement or epoxy). Internal lined or coated carbon steel is protected from erosion/corrosion in flowing sea water. However, a breakdown of coatings can lead to erosion/corrosion. The breakdown of coatings is generally limited to small localized areas and the structural integrity of the 1A header would be maintained.

Since the failure (hole of increasing size) of this 30" line would not create a safety concern, this temporary repair serves as a housekeeping provision only. Therefore, it is acceptable if this temporary repair is not completely leak tight and if leakage occurs with the plug or patch installed.

Augmented Inspection:

An augmented inspection was performed on eight (8) locations with similar configurations and materials. Three (3) locations upstream of the failure in the 1A header and five (5) locations on the 1B header were inspected for signs of leakage by visual and thickness by ultrasonic thickness measurements (JPN-CSI-94-151). The inspection was limited to the connection between the 30" piping and the threadolet/sockolet attached to the 1A or 1B 30" header. No leakage was observed and resulting thickness measurements provide adequate wall thickness with no signs of localized thinning.

L-94-254
Attachment 4

The augmented inspection supports the conclusion that the existing failure is an isolated corrosion cell due to breakdown of protective coatings.

Required Actions:

1. Perform a temporary non-code repair per the method described above.
2. Perform weekly inspections of the temporary repair to insure that adequate house keeping measures are maintained for any increased leakage.
3. Nuclear Engineering to provide final engineering disposition and root cause analysis.