

# CATEGORY 1

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ACCESSION NBR:9803300267      DOC.DATE: 98/03/20      NOTARIZED: NO      DOCKET #  
 FACIL:50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co.      05000335  
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 STALL, J:A      Florida Power & Light Co.  
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SUBJECT: Submits suppl 1 of Interim Relief Request 17 re in-svc-insp plan for third 10-Yr interval.

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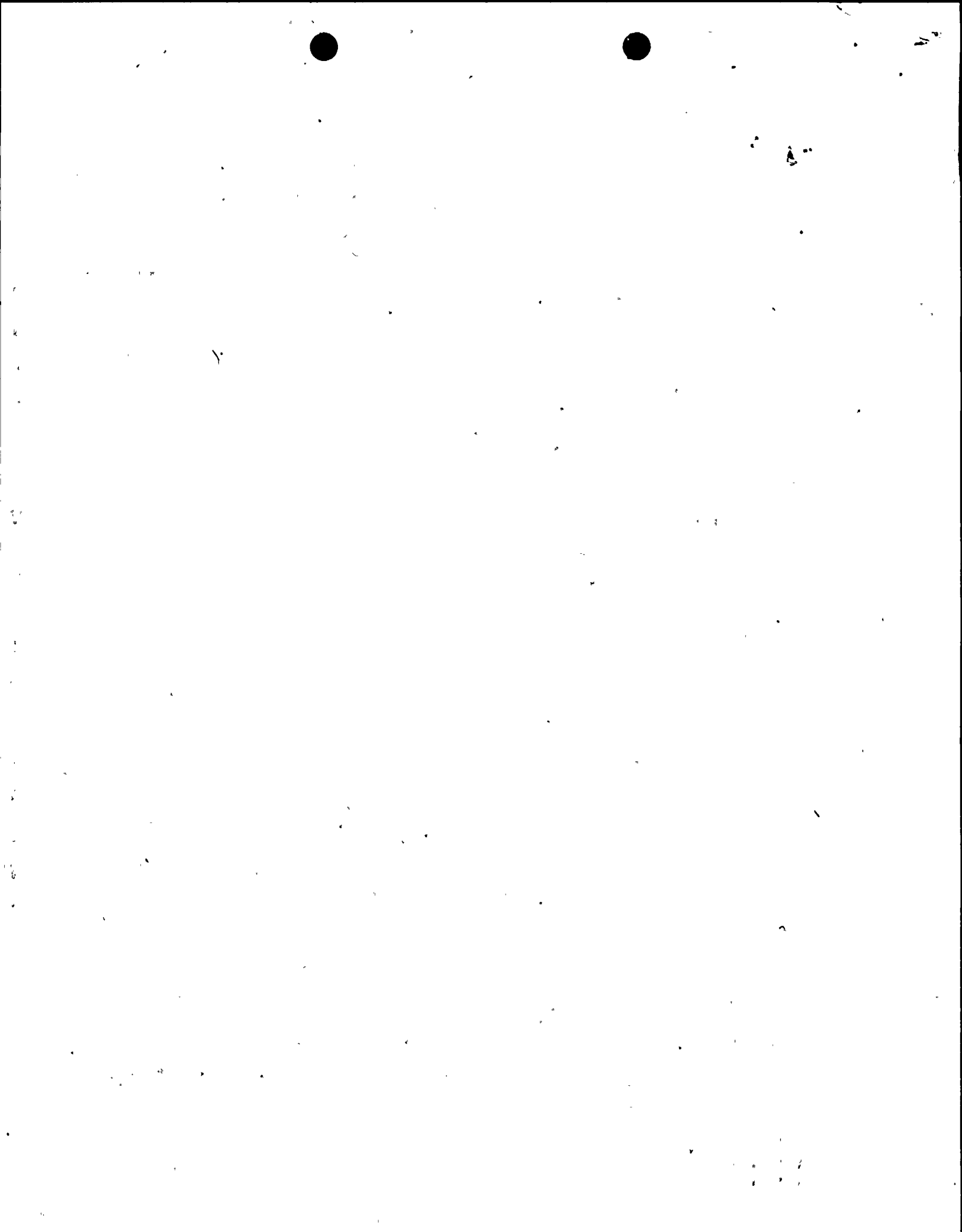
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INTERNAL:	ACRS		1	1	AEOD/SPD/RAB	1	1	
	<u>FILE CENTER</u> 01		1	1	NRR/DE/EMEB	1	1	
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	NRC PDR		1	1				

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March 20, 1998

L-98-75  
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  
Third Ten-Year Interval  
Supplement 1 of  
Interim Relief Request 17

On March 2, 1998, Florida Power and Light Company (FPL) requested approval of interim relief request 17, *Main Feed Isolation Valve Bypass Line Repair*. Relief request 17 is needed to support the temporary non-code repair which installed an engineered mechanical clamp to enclose a feedwater/steam leak at a socket welded elbow fitting on the one inch bypass line for MV-09-7, main feed isolation valve. This supplement of relief request 17 is a complete replacement for our original request submitted by FPL letter L-98-068 on March 2, 1998. Supplement 1 provides the additional commitments verbally requested by the NRC-NRR project manager for St. Lucie on March 6, 1998.

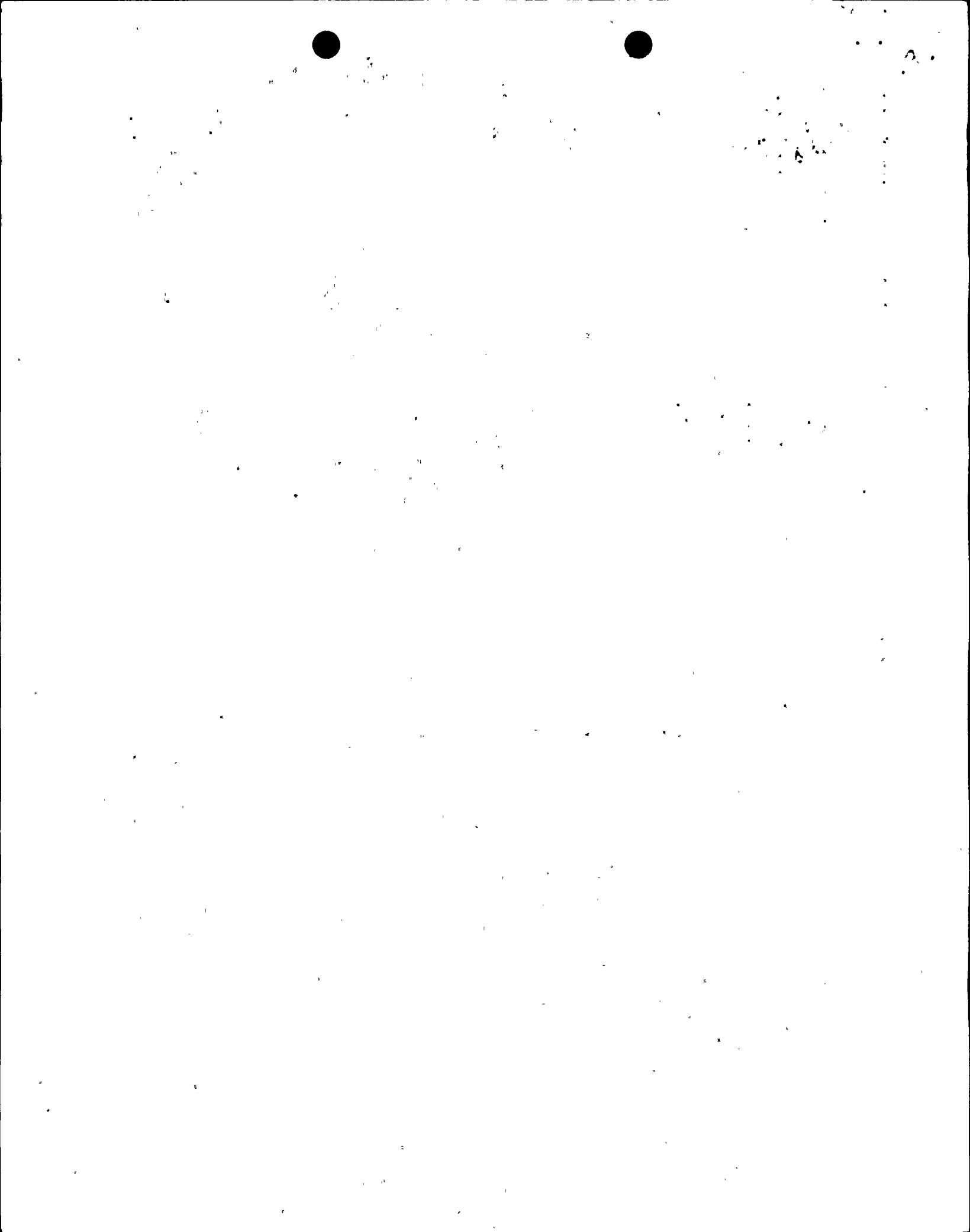
On February 27, 1998, a small feedwater/steam leak was noted on a one inch socket welded elbow fitting located on the downstream side of the bypass line. The leak was characterized as a feedwater leak creating a visible jet of steam about two feet long creating a moist area on the adjacent lagging and scaffold. The leak is considered minor in nature (approximately three gallons per hour based on collection of the mist). The leak is unisolable and is subject to full main feedwater header pressure during plant operation. FPL has determined that an ASME code repair is not practical in that the affected piping is unisolable. A plant shutdown and cooldown would be required to perform a code repair on the leaking pipe which would unnecessarily cycle plant systems and components.

Relief request 17 approval is requested to support the use of an engineered clamp for the temporary repair of pressure boundary leakage on the 1A main feed isolation valve bypass piping. Use of the relief request would allow the temporary repair of the piping with Unit 1 in service.

9803300267 980320  
PDR ADDOCK 05000335  
Q PDR




A047



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This letter contains the following regulatory commitments. The clamping device, constructed in accordance with this relief request, will remain in service only until the next cold shutdown of sufficient duration or the next refueling outage (SL1-16), at which time the defect will be repaired or replaced in accordance with IWA-4000. While the temporary repair is in place, it will be visually inspected by plant personnel daily for signs of degradation. When the code repair is implemented, the failure site will be examined, the root cause of the failure determined, and the results of the root cause analysis will be submitted to the NRC.

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

Very truly yours,  


J. A. Stall  
Vice President  
St. Lucie Plant

JAS/GRM

Attachments

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

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Docket No. 50-335  
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Relief Request No. 17  
Main Feed Bypass Line Repair

Component Identification:

1A main feed isolation valve bypass one inch line  
Class 2

Code Requirement:

Section XI 1989 Edition IWC-4000 which refers to IWA-4000  
Repair procedures - Requires that repairs be performed in accordance with this Article.

Code Requirement From Which Relief Is Requested:

During operation, leakage was detected on the 1A main feed isolation valve bypass line.

Relief is requested from the repair requirement of the ASME Boiler and Pressure Vessel Code Section XI 1989 Edition, Articles IWC/IWA-4000.

Basis for Relief:

See Attachment

Alternate Repair:

- a) FPL will perform a temporary non-code repair on the 1A main feed bypass line using an engineered clamp as described in the basis for relief. This repair will perform the function of leakage prevention, and will remain in place no later than the next cold shutdown of sufficient duration or the next refueling outage (SL1-16). At that time, a Code Repair/Replacement will be performed.
- b) While the temporary repair is in place, it will be inspected visually by plant personnel daily for signs of degradation.
- c) When the code repair is implemented, the failure site will be examined, the root cause of the failure determined, and the results of the root cause analysis will be submitted to the NRC for information.

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Implementation Schedule:

The remainder of St. Lucie Unit 1 Cycle 15. At the next cold shutdown of sufficient duration or the next refueling outage (SL1-16), the defect will be repaired or replaced in accordance with IWA-4000.

Attachments:

Engineering basis for performing a temporary non-code repair.

## Basis for the Relief

### 1.0 Background/Purpose

Operational leakage was discovered in the socket weld joint for the downstream elbow of the MV-09-7, main feed isolation valve (MFIV) bypass line. This elbow is adjacent to V09188. The leak is characterized as a feedwater leak creating a visible jet of steam about two feet long creating a moist area on the adjacent lagging and scaffolding below. The leak is considered minor in nature (approximately three gallons per hour based on collection of the mist), but needs to be stopped to minimize further steam cutting of the MV-09-7 bypass line elbow weld. This evaluation addresses the temporary clamping of the steam leak with a leak repair enclosure to encapsulate the elbow and a clamp to absorb the axial loading adjacent to the affected socket weld. Generic Letter (GL) 90-05 states that for code Class 1 and 2 piping, a licensee is required to perform code repairs or request NRC to grant relief for temporary non-code repairs on a case-by-case basis regardless of pipe size. This evaluation provides the technical basis for making a non-code repair.

### 2.0 Basis for Relief

#### Structural Integrity

The leak repair enclosure and clamp is considered a non-code repair to stop the leakage to prevent further steam cutting of the MV-09-7 (Figure 1) bypass line elbow weld. The leak is located in an oval pinhole in a socket weld near the fitting edge. In accordance with GL 90-05, the overall design of the leak repair enclosure will assume a postulated full circumferential severance of the socket weld at the defect location.

The design pressure and temperature of the subject piping is 1100 psig and 500°F which is consistent with the feedwater (FW) system piping downstream of the MFIV. As the enclosure design meets or exceeds these design requirements, the leak repair enclosure is capable of withstanding design conditions consistent with FW system pressure boundary components. The system fluid is demineralized condensate which is compatible with the enclosure and clamp materials.

#### Enclosure and Clamp Design

Figure 2 and Figure 3 provide the design details for the temporary leak repair enclosure and clamp. The enclosure is designed for the conditions specified above. The enclosure (Figure 2) completely envelopes the elbow fitting and weld and therefore the clamping device size will accommodate any projected growth of the flaw.



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The materials of construction are acceptable for the application. The enclosure is made of SA 516 Gr. 70 carbon steel with SA-193 Gr B7 studs and SA-194 Gr. 2H nuts. A friction clamp (Figure 3) provides a means of absorbing the axial load in the extremely remote possibility that the flaw propagates circumferentially around the weld joint. The enclosure design is based on stress limits in Table NC-3321-1, and meets Level A Service Limits of Section III using normal system operating conditions, and assuming postulated full circumferential severance of the pipe at the defect location. The enclosure is mechanically clamped to the pipe with a friction factor not exceeding 0.3 and designed to produce a friction load five times the slippage load. Figure 4 and Figure 5 show plan and elevation views of the installed engineered clamp.

Review of the enclosure design has been performed to ensure the enclosure meets the intent of GL 90-05. Based on this review, it has been concluded that the subject temporary leak repair enclosure and clamp is suitable for the intended application and capable of performing the design functions specified. As the defect is located in a weld zone, the repair enclosure completely surrounds the subject fitting, and the enclosure design will accommodate full circumferential severance of the socket weld at the defect location. A plan for monitoring defect growth in the area immediately adjacent to the clamping device is not required.

#### Pipe Stress/Support Analysis

The bypass line is depicted on Drawing 8770-G-125 Sheet BF-M-6. Engineering walkdown has shown that the perpendicular stub connections to the process line is approximately six inches long. The distance (parallel direction to the process line) between the two stub connections is 34 inches as per EMDRAC 8770-7002. The proposed leak repair enclosure will be installed over the leaking elbow downstream of valve V09188. The weight of the leak repair enclosure is less than 40 lbs and the clamp weighs 10 lbs (Figure 1). A stress analysis of the bypass line and the affected process line with the additional weight of the leak repair enclosure and clamp has been performed in calculation BF-0659A. The results show that the additional weight does not adversely affect the Code pipe stress requirements and no additional supports are required.

#### Temporary Clamp Sealing Compound

The sealant used will be FSC-N-3B, or better. The sealant is thermal setting and is injected while the system is at operating pressure and temperature. The volume of injected sealant is based on the calculated volume of the leak repair enclosure. The maximum volume and the maximum injection pressure, which includes the extrusion pressure (pressure required to push the sealant into the mold), plus the molding pressure (the pressure required to fill the mold) and the operating pressure (pressure that must be

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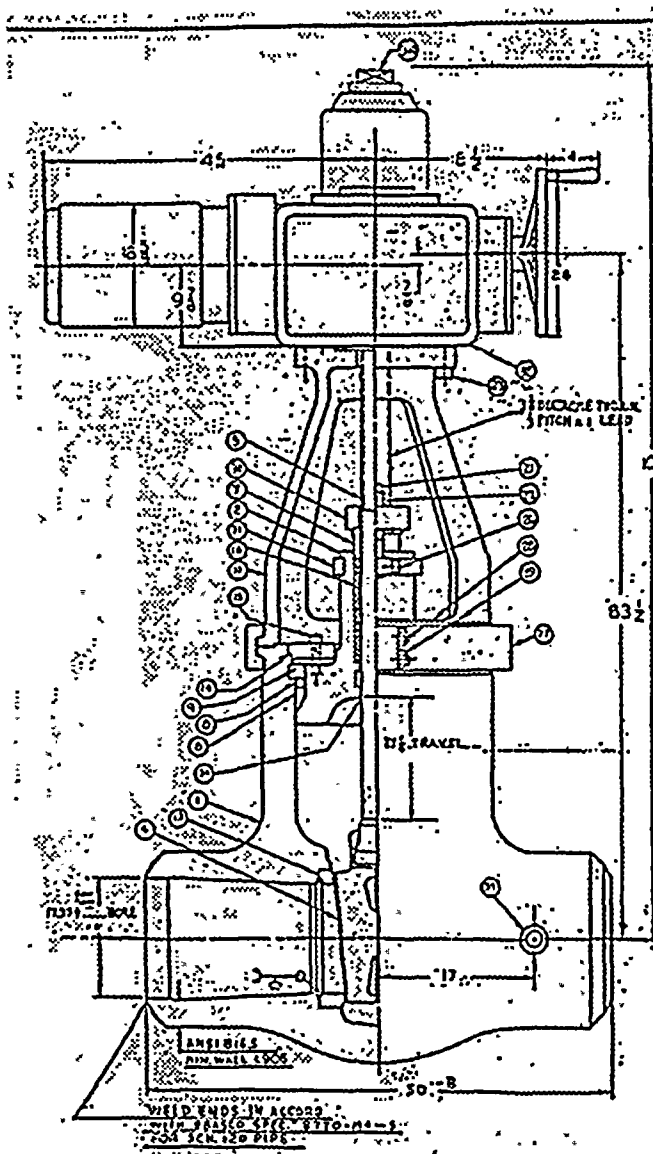
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overcome to fill the leak repair enclosure), ensures that the sealant does not overcome the system pressure and enter the system. This injection method precludes "mainlining" of the sealant into the system. These leak repair methods have proven effective in sealing leaks on similar components with similar failures.

### 3.0 Summary

The installation of the temporary leak repair enclosure will not introduce any new failure modes for the main feedwater system. The leak repair enclosure is a passive device and does not perform any active safety function. In addition, the temporary leak repair enclosure has been designed for the appropriate loading conditions, and as such, its failure is not assumed. Structural integrity of the affected piping system is not affected by the installation. The injection material and injection pressures have been analyzed to ensure that no contaminants are introduced into the system, and that system operation is not adversely affected. Based on the above, the temporary clamping of a feedwater leak at an elbow in the one inch bypass line for MV-09-7 does not alter or jeopardize any of the design described in the UFSAR.



**GENERAL NOTES**

- VALVE DESIGN IN ACCORDANCE WITH ANSI 216.5 AND LEAK SPECIFICATION F10-070-111, REV. 2, DATED NOVEMBER 1, 1970 AND F10-070-300, REV. 2, DATED JULY 10, 1969.
- INSPECTIONS IN ACCORDANCE WITH ANCHOR/DARLING VALVE CO. QUALITY ASSURANCE MANUAL.

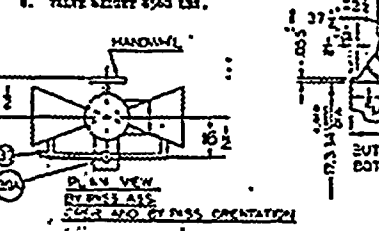
NON-DESTRUCTIVE TESTS			REQ'D
RADIOGRAPHY	ASTM B-94	100%	YES
RADIOGRAPHY	ASTM B-94	PARTIAL	
MAGNETIC PARTICLE	ASTM B-109	100%	YES
MAGNETIC PARTICLE	ASTM B-109	PARTIAL	
LIQUID PENETRANT	ASTM B-109	100%	
		W/CH	YES
		STAINES	YES
		SAFO	YES
		W/CH	YES
		ENCS	YES

MECHANICAL TROWING SPECIFICATIONS	
FAST RATE	10 STROKES/30
Body	20 900 62E-1
Bracket	32 900 62E-2
Disc	20 900 62E-3

**5. HYDRAULIC TESTS:**

- SEAL IN ACCORDANCE WITH ANSI 216.5 at 200 PSIG. TEST DURATION: 10 MINUTES MIN.
  - SEAL CHECKS IN ACCORDANCE WITH F10-070-111 AT 200 PSIG. AND 10 PSI ALLOWABLE LEAKAGE RATE 2 CC/INCH OF DIA. OF ORIGINAL VALVE SIZE. TEST DURATION: 2 MINUTES MIN.
- 6. REFERENCE PROCEDURES (ANCHOR):**
- LIQUID PENETRANT (W/CH SUPP) 1180-2
  - LIQUID PENETRANT (MAGNETIC) 1181-2
  - REPAIR WELDING FOR CAST VCS 1182-1
  - WELDING REPAIR FOR CAST VCS 1186-2

CLASSIFICATION OF TESTS		REQ'D
RADIOGRAPHY		YES
LIQUID PENETRANT		YES
MAGNETIC PARTICLE		YES
HYDRAULIC TEST		YES
ULTRASONIC TEST		
CRACK PROBE		
SEAL DAMAGE TEST		YES



PARTS LIST		
ITEM NO.	NAME OF PART	ASTM SPEC
1	BODY	A136-WCB
1-A	DISC GROUND	A534-70
2	ROCKET	A136-WCB
3	DISC W/STABILITE	A136-WCB
4	STEM	A136-A16
5	VALVE'S SEAL GASKET	SOFT TPOB
6	FOLLOWER CLASP	A519-87
7	SPACER RING	A519-70
8	GASKET SEALING RING	A519-70
9	TOOK	A136-WCB
10	SEAT RING W/STABILITE	A519-70
11	ROCKET SPRING RING	A519-70
12	PACKER	COM. STEEL
13	CLAMP BOLTS	3008 GRADE 187-1
14	FOLLOWER RING	A193-87
15	CLAMP CLAMP CAPSCREW	A194-28
16	TOOK CLAMP	COM. STEEL
17	TOOK CLAMP STUD	A193-87
18	TOOK CLAMP RING	A136-WCB
19	FOLLOWER FLANGE	A136-WCB
20	CLAMP CLAMP	A136-WCB
21	LONGSHANK OPERATOR	COM. STEEL
22	LONGSHANK CAPSCREW	COM. STEEL
23	BACKING W/STABILITE	A136-A16
24	STRASS CONNECTION	COM. STEEL
25-A	STRASS VALVE	A136-304
26	RAMFLATE	A136-304
27-A	T.D. PLATE	A136-304

MOTOR CLOSING TIME (55) SECONDS

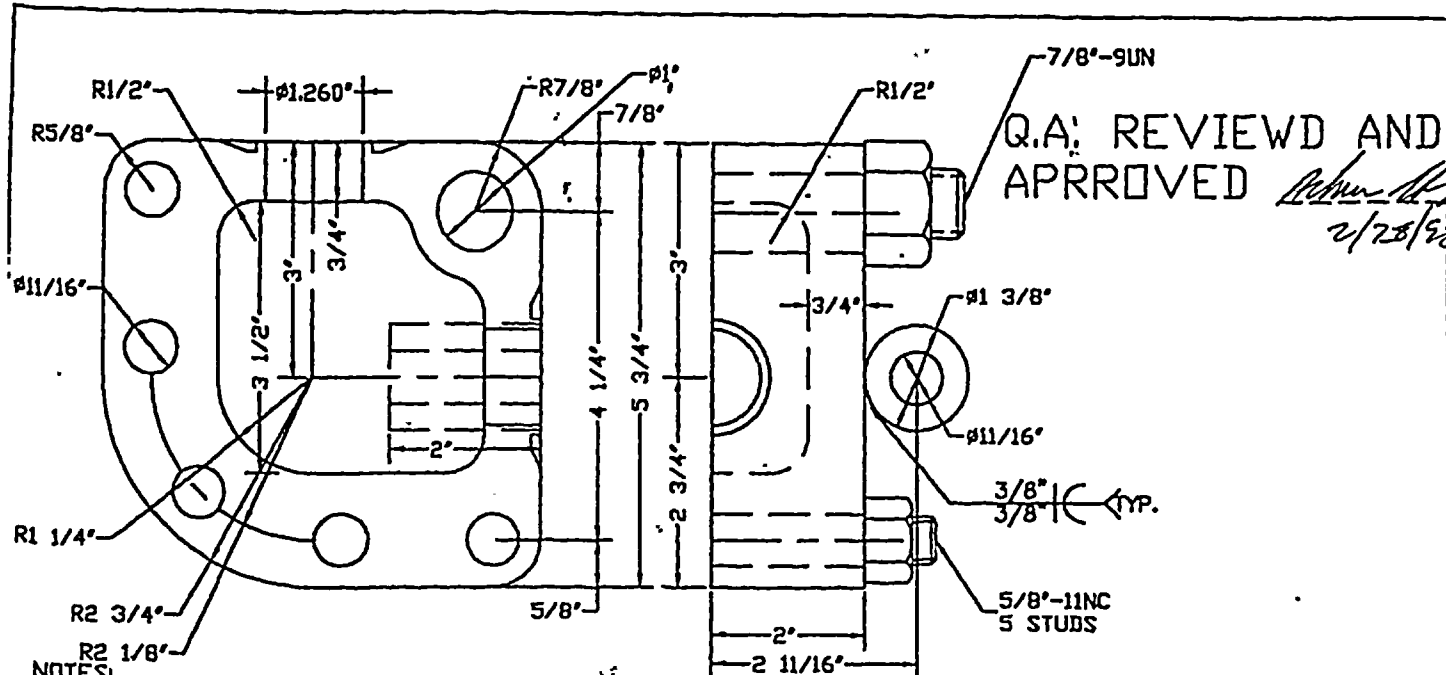
NOTE: VALVE FORCE SENSOR FOR DIAGNOSTIC TESTING IS MOUNTED ON THE VALVE YOKE PER PCD 231-132.

EBASCO SERVICES INC.  
 FLORIDA POWER & LIGHT CO.  
 VALVE TAG NOS. EMV-09-7  
 DESIGN CLASS I. EMV-09-8  
 DESIGN CLASS II.  
 ANCHOR/DARLING SO. E5965

ANCHOR / DARLING VALVE COMPANY WILMINGTON, PA. U.S.A. 17781	
20-900 WELDING ENDS	
CARBON STEEL, FLEX	
WEDGE GATE VALVE WITH	
SB-4-200 MOTOR OPER.	
3LP	27-13796

Figure 1

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NOTES:

1. SAFETY RELATED;
2. PROCEDURE NUMBER: N-98086.
3. COMPONENT DESIGNATION: V09188.
4. INJECTION POINTS: DRILL THRU Ø3/16", DRILL AND TAP FOR 3/8"-16NC X 3/8" DEEP. 2/HALF.
5. PEENING GROOVE: 1/8" X 1/8" X 60°.
6. ALL DIMENSIONS ARE TYPICAL UNLESS SPECIFIED.
7. TUBE LUGS WILL BE WELDED AT THE CUSTOMER WELDING SHOP.

APPROVED FOR FABRICATION

MATERIAL LIST: (CARBON STEEL)

PLATE:	SA-516 GR.-70
FITTING:	N/A
PIPE:	N/A
STUDS:	SA-193 GR.-B7
NUTS:	SA-194 GR.2H
TUBE LUGS:	SA-516 GR.-70
PACKING:	N/A

WEIGHT ESTIMATE 35 LBS

COMPOUND ESTIMATE 25.5 STEEL

COMPOUND TYPE FSC-N-3B/6B



TOLERANCES UNLESS SPECIFIED  
 MACHINED SURFACES ✓  
 XX (1 DECIMAL) ± 0.100  
 X.XX (2 DECIMAL) ± 0.030  
 X.XXX (3 DECIMAL) ± 0.010  
 FRACTIONAL ± 1/16  
 FRACTIONAL "BURN" +1/8 -0

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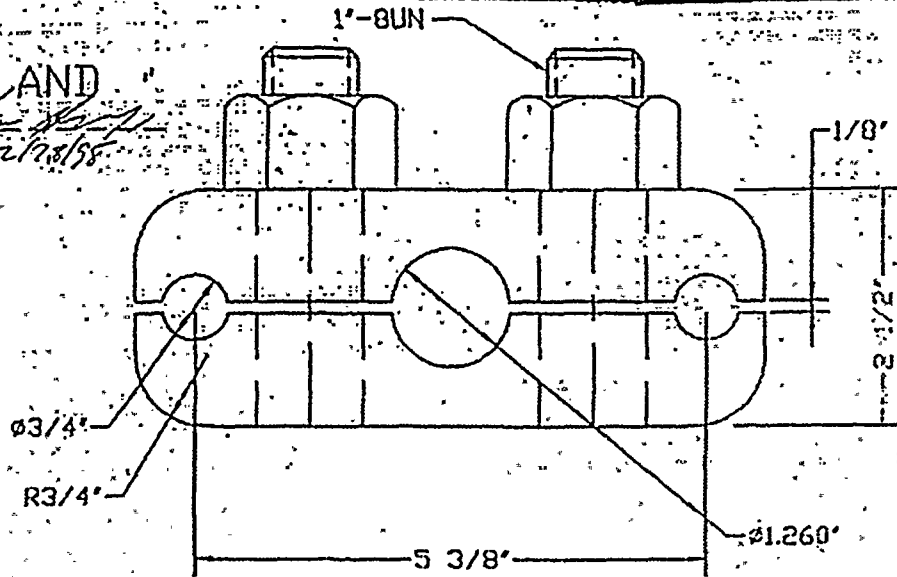
**FURMANITE** ENGINEERING GROUP  
 A KAHN COMPANY  
 OFFICE (800) 878-8788 (214) 461-7444 FAX (214) 283-8088  
 LA PORTE, TEXAS, USA

DESIGN EAH	CONTENT FEEDWATER	DESIGN PSI 1100
CHECKED LTD/PTC	TECHNICIAN BOB JACQUES	DESIGN TEMP 550-500
APPROVED	SHIPPING CAI REGION	WPS WPS0002

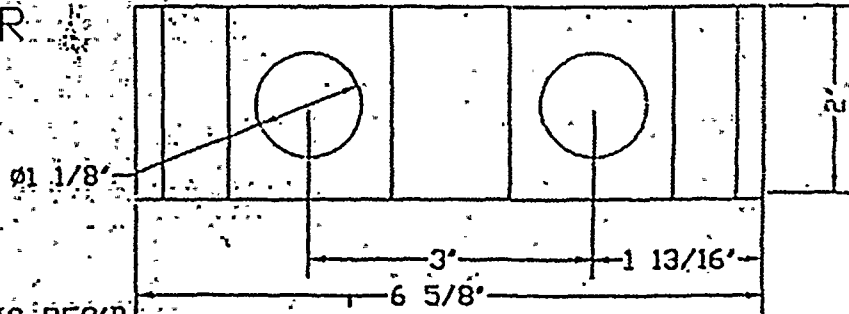
CUSTOMER FLORIDA POWER & LIGHT ST. LUCIE NUCLEAR ST.		DATE 02/27/98	REQ'D ASAP	UNIT #1	SHEET 1/2
JOB FIA-625	CUST.				

Figure 2

Q.A. REVIEWED AND APPROVED  
*2/27/98*



APPROVED FOR FABRICATION

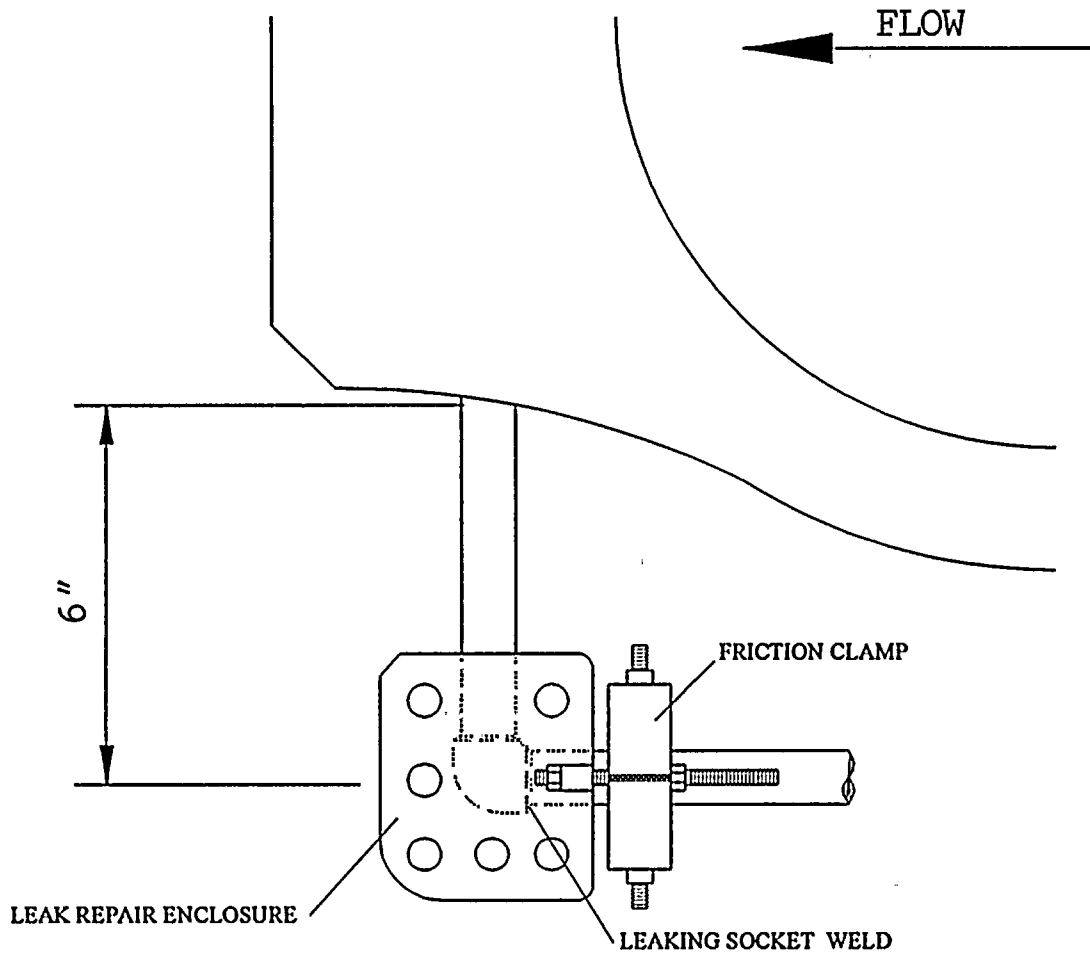


NOTES:

- ONE FRICTION CALMP IS REQ'D.
- (2) 5/8"-11NC X 12" LONG
- Torque clamping studs to 184 ft-lbs.

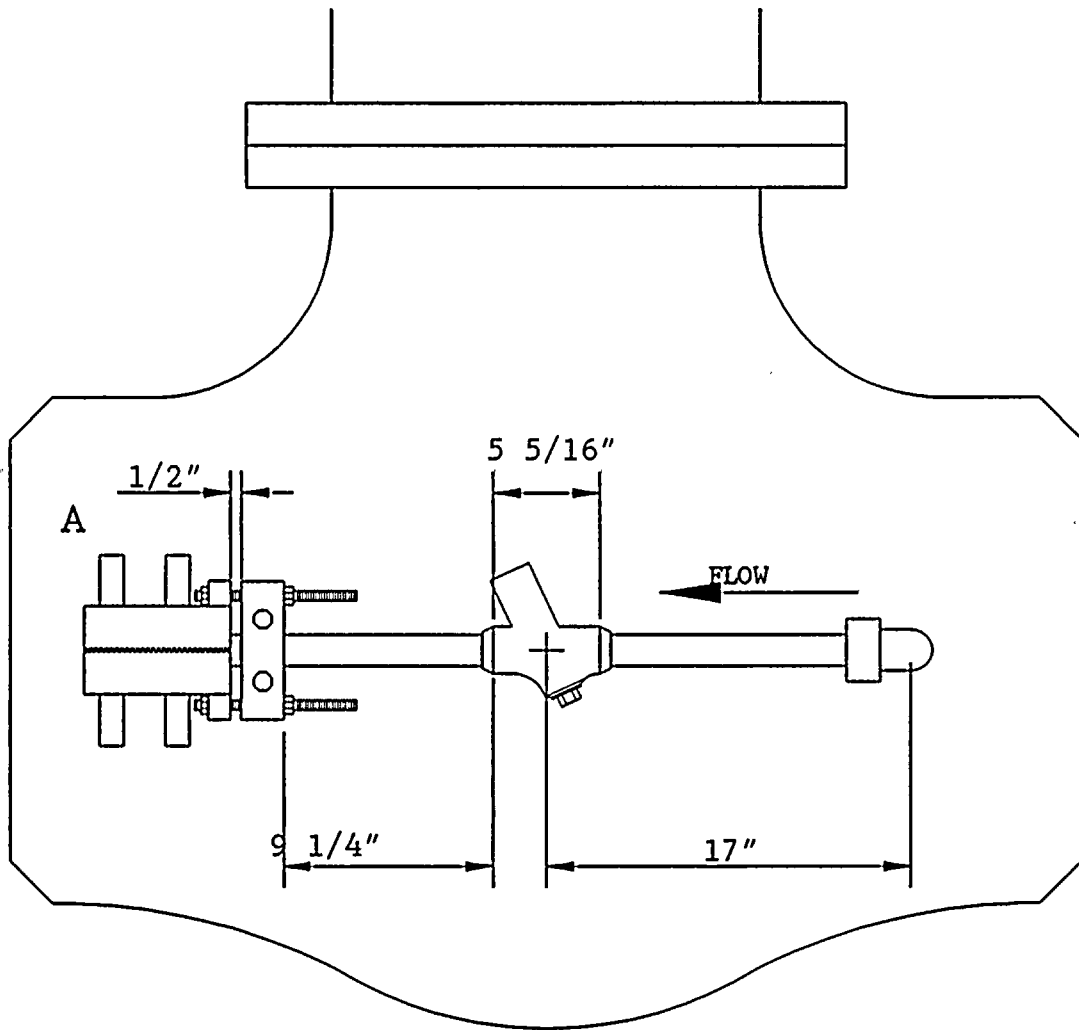
DRAWN BY: <i>WHA 2/27/98</i>	TOTAL WEIGHT: 10 LBS	DOC NO.: ELA-625	DMG NO.: SE-98381	ORDER NO.: 980843	REV: 8
CHECKED BY: <i>LTD / PTC 2/28</i>		SCALE: 1=1.5	DATE: 02/27/98	REQ'D: ASAP	SHEET: 2/2

Figure 3



MV-09-7  
BY-PASS

Figure 4



MV-09-7  
BY-PASS

Figure 5