05/20/1999 Assigned to: CIAMARRA, RICHARD A Status: Closed + Approved

Action Requsted: Prepare Sl-2 Report
Assignee Response: See SL Report

Significance Level 2 Report
Background:
The chlorination system was secured for maintenance work between February 2, 1999 and March 19, 1999. Prior to February 2, Chemistry was detecting positive chlorine readings in various service water streams at expected levels of greater than 1 PPM. The chlorination system was returned to service on March 19 at a typical flow rate of 0.2 GPM. During April, the flow rate was increased to 0.3-0.4 GPM. Chemistry was unable to detect chlorine in any part (essential and non-essential) of the service water system from March 19 to April 21. On April 21, the chlorination system was secured to investigate the cause of lack of chlorination.

Analysis:
The chlorination system was removed from service for maintenance on or about February 2, 1999. Seven work orders were completed on the system (99-06553, 99-06517, 99-06516, 99-07174, 99-07120, 98-05663, 99-07357) . All the maintenance work performed was located within the screenwell house with no impact to external piping to the screenwell house. The system was returned to service on 3/19/99. Per SFS logbook, tag out 1130-chlorination to unit 2 service water was removed at 0528 hours on 3/19. At 0630 hours, the unit 2 chlorination system was in service at 0.2 GPM to the service water system, per SRO log. On 3/19, storage tanks 11 and 12 had 3200 and 2950 gallons, respectively at 0530 hours per chemist log. According to chemistry data sheets, no chlorine was detected after the system was returned to service. At 0445 hours on 3/20, 12 chlorine pump was started and 11 secured but a flow rate of 0.2 GPM was maintained, per SFS log.

During the week beginning 3/29, the system alignment was checked by the operations group to ensure agreement with the established procedures. It was also reported, during a watch turnover meeting at which the system engineer was present, that another operations group has already performed the system alignment check. The results of the alignement were that the field and procedure are in agreement. On 4/2, CR 19902740 was written. This CR identified that no chlorine is being detected and the stroke/flow rate of chlorine was increased. This is typically when chlorine is not detected. The flow was increased to 0.4 GPM. Typically, 48 hours subsequent to a flow rate adjustment, chlorine is detected. In this case, chlorine was not detected and for unknown reasons the flow rate was returned to 0.2 GPM on 4/3. This was insufficient time at the 0.4 GPM flow rate. On 4/2, storage tanks 11 and 12 had 1150 and 0975 gallons, respectively at 1530 hours per chemist log. At 1923 hours, Operations received a shipment of sodium hypochlorite, filling the tanks to levels of 2400 and 2050 gallons. This indicates that chlorine was being pumped but yet still not detected anywhere in the system.

IPEC00202948

Beginning on 4/5, the flow rate was increased to 0.32 GPM. Following this, the flow rate remained between 0.3 and 0.4 GPM until 4/15. At this level of chlorination, there was still no detection and it was expected that there would be. A walkdown of the entire system was performed by engineering for signs of leakage. Specific attention was placed on the piping in the circulating bays. There was no evidence of leakage. On 4/21, the chlorination system was secured to investigate the cause of lack of chlorination.

Following the system shutdown, an operational test was conducted with Operations, Chemistry and System Engineering. The intent of the test was to verify chlorine was being pumped. It consisted of closing all inlet valves to the circulating and service water bays. Then, the drain valve CL-1164 was opened. The outlet of the hose can be observed by entering 23 circulating bay. There was no flow out of the hose but yet inside the screenwell house there was an indicated flow of 0.3 GPM. A walkdown of the piping in the bays was performed and there was no evidence of leakage.

At this point, it was determined to test the underground portion of the piping system. The underground section was isolated by removing a flanged tee located in 21 circulating bay (just where the piping exits the ground), installing here a blind flange with a valve. A clean-out tee was removed (just where the piping exits the ground above grade) and another blind flange and valve to perform a hydrotest. CIty water pressure was used and the line was flushed clear with no evidence of blockage. The piping was pressurized and the pressure decreased approximately 30 PSI within 15 minutes. The isolation of the underground piping completely disconnects the entire piping system at the dock area as well as isolating it from the screenwell house/above ground piping. Dow Corning, the manufacturer of the lined piping, was contacted for their input on potential failure modes. Their response was they do not endore nor approve the use of the flanged lined piping system underground. Furthermore, they would provide no engineering services if we proceeded with this type of installation. We further discussed the materials of construction, saran lined. Saran lining is a proprietary product to Dow Corning who no longer manufacturers it due to it increased brittleness over time. A suitable substitute material was determined to be teflon lined piping, due primarily to variations in a 15% trade volume of sodium hypochloride between vendors. Based on all the information present, a leak in the underground section of piping was determined.

The decision was made to excavate the piping to determine the failure mechanism. During the excavation, valve maintenance performed a valve replacement for CL-11 under work order NP-98-04243. This valve was frozen in an unknown position. The valve was outside the boundary of the hydrotest and is the inlet to North Service Water Bay. In addition to this work, Chemistry sampled the soil at several levels to determine if residual chlorine was present. There was no detection. Furthermore, there was no expectation as to whether or not we would find something due to the decomposition over the period of time.

While the excavation continued, system engineering continued in the investigation by reviewing the modification history for the system. Investigation into the work order history found that the entire piping system outside the screenwell house was replaced.

IPEC00202949

Discussion with the design engineer revealed that although the modification was to replace all sections of underground piping and relocate most of it above ground, there is one section that was not replaced due to it being inaccessible. At this point, it was suspected that one of the flanged connections on the original piping would be the failure. Due to the rapidly rising river water temperature, a TFC was implemented to bypass the underground piping. This connected the above ground piping, where the clean-out tee was removed for the hydrotest, to drain valve CL-1164. After its installation, chlorine was detected in the plant.

Upon completion of the excavation, a second hydrotest was performed. The piping reportedly held pressure for several days. Although, unusual for this to occur, the soil loading above the piping, soil support loading and human interaction with the piping may have affected the system to pass the test. Since the piping was exposed and DEC regulations 598 and 599 apply to this piping, a environmentally conscious decision was made to relocate the piping above ground.

Root Cause Failure:
Based on the conflicting data obtained, a clear and concise root cause failure can not be determined. Although, it is highly probable, that the failure was the result of degradation of the bolts on one buried flanged connections. In addition, overstressing of the connection and detioration of the liner at the mating faces of the flanges may have contributed.

- -

Perform modification to remove the underground piping, as much as practical, and replace it aboveground.

IPEC00202950

05/20/1999 Assigned to: CIAMARRA, RICHARD A Status: Closed + Approved

Action Requsted: Prepare Sl-2 Report
Assignee Response: See SL Report

Significance Level 2 Report
Background:
The chlorination system was secured for maintenance work between February 2, 1999 and March 19, 1999. Prior to February 2, Chemistry was detecting positive chlorine readings in various service water streams at expected levels of greater than 1 PPM. The chlorination system was returned to service on March 19 at a typical flow rate of 0.2 GPM. During April, the flow rate was increased to 0.3-0.4 GPM. Chemistry was unable to detect chlorine in any part (essential and non-essential) of the service water system from March 19 to April 21. On April 21, the chlorination system was secured to investigate the cause of lack of chlorination.

Analysis:
The chlorination system was removed from service for maintenance on or about February 2, 1999. Seven work orders were completed on the system (99-06553, 99-06517, 99-06516, 99-07174, 99-07120, 98-05663, 99-07357) . All the maintenance work performed was located within the screenwell house with no impact to external piping to the screenwell house. The system was returned to service on 3/19/99. Per SFS logbook, tag out 1130-chlorination to unit 2 service water was removed at 0528 hours on 3/19. At 0630 hours, the unit 2 chlorination system was in service at 0.2 GPM to the service water system, per SRO log. On 3/19, storage tanks 11 and 12 had 3200 and 2950 gallons, respectively at 0530 hours per chemist log. According to chemistry data sheets, no chlorine was detected after the system was returned to service. At 0445 hours on 3/20, 12 chlorine pump was started and 11 secured but a flow rate of 0.2 GPM was maintained, per SFS log.

During the week beginning 3/29, the system alignment was checked by the operations group to ensure agreement with the established procedures. It was also reported, during a watch turnover meeting at which the system engineer was present, that another operations group has already performed the system alignment check. The results of the alignement were that the field and procedure are in agreement. On 4/2, CR 19902740 was written. This CR identified that no chlorine is being detected and the stroke/flow rate of chlorine was increased. This is typically when chlorine is not detected. The flow was increased to 0.4 GPM. Typically, 48 hours subsequent to a flow rate adjustment, chlorine is detected. In this case, chlorine was not detected and for unknown reasons the flow rate was returned to 0.2 GPM on 4/3. This was insufficient time at the 0.4 GPM flow rate. On 4/2, storage tanks 11 and 12 had 1150 and 0975 gallons, respectively at 1530 hours per chemist log. At 1923 hours, Operations received a shipment of sodium hypochlorite, filling the tanks to levels of 2400 and 2050 gallons. This indicates that chlorine was being pumped but yet still not detected anywhere in the system.

IPEC00202951

Beginning on 4/5, the flow rate was increased to 0.32 GPM. Following this, the flow rate remained between 0.3 and 0.4 GPM until 4/15. At this level of chlorination, there was still no detection and it was expected that there would be. A walkdown of the entire system was performed by engineering for signs of leakage. Specific attention was placed on the piping in the circulating bays. There was no evidence of leakage. On 4/21, the chlorination system was secured to investigate the cause of lack of chlorination.

Following the system shutdown, an operational test was conducted with Operations, Chemistry and System Engineering. The intent of the test was to verify chlorine was being pumped. It consisted of closing all inlet valves to the circulating and service water bays. Then, the drain valve CL-1164 was opened. The outlet of the hose can be observed by entering 23 circulating bay. There was no flow out of the hose but yet inside the screenwell house there was an indicated flow of 0.3 GPM. A walkdown of the piping in the bays was performed and there was no evidence of leakage.

At this point, it was determined to test the underground portion of the piping system. The underground section was isolated by removing a flanged tee located in 21 circulating bay (just where the piping exits the ground), installing here a blind flange with a valve. A clean-out tee was removed (just where the piping exits the ground above grade) and another blind flange and valve to perform a hydrotest. CIty water pressure was used and the line was flushed clear with no evidence of blockage. The piping was pressurized and the pressure decreased approximately 30 PSI within 15 minutes. The isolation of the underground piping completely disconnects the entire piping system at the dock area as well as isolating it from the screenwell house/above ground piping. Dow Corning, the manufacturer of the lined piping, was contacted for their input on potential failure modes. Their response was they do not endore nor approve the use of the flanged lined piping system underground. Furthermore, they would provide no engineering services if we proceeded with this type of installation. We further discussed the materials of construction, saran lined. Saran lining is a proprietary product to Dow Corning who no longer manufacturers it due to it increased brittleness over time. A suitable substitute material was determined to be teflon lined piping, due primarily to variations in a 15% trade volume of sodium hypochloride between vendors. Based on all the information present, a leak in the underground section of piping was determined.

The decision was made to excavate the piping to determine the failure mechanism. During the excavation, valve maintenance performed a valve replacement for CL-11 under work order NP-98-04243. This valve was frozen in an unknown position. The valve was outside the boundary of the hydrotest and is the inlet to North Service Water Bay. In addition to this work, Chemistry sampled the soil at several levels to determine if residual chlorine was present. There was no detection. Furthermore, there was no expectation as to whether or not we would find something due to the decomposition over the period of time.

While the excavation continued, system engineering continued in the investigation by reviewing the modification history for the system. Investigation into the work order history found that the entire piping system outside the screenwell house was replaced.

IPEC00202952

Discussion with the design engineer revealed that although the modification was to replace all sections of underground piping and relocate most of it above ground, there is one section that was not replaced due to it being inaccessible. At this point, it was suspected that one of the flanged connections on the original piping would be the failure. Due to the rapidly rising river water temperature, a TFC was implemented to bypass the underground piping. This connected the above ground piping, where the clean-out tee was removed for the hydrotest, to drain valve CL-1164. After its installation, chlorine was detected in the plant.

Upon completion of the excavation, a second hydrotest was performed. The piping reportedly held pressure for several days. Although, unusual for this to occur, the soil loading above the piping, soil support loading and human interaction with the piping may have affected the system to pass the test. Since the piping was exposed and DEC regulations 598 and 599 apply to this piping, a environmentally conscious decision was made to relocate the piping above ground.

Root Cause Failure:
Based on the conflicting data obtained, a clear and concise root cause failure can not be determined. Although, it is highly probable, that the failure was the result of degradation of the bolts on one buried flanged connections. In addition, overstressing of the connection and detioration of the liner at the mating faces of the flanges may have contributed.

- -

Perform modification to remove the underground piping, as much as practical, and replace it aboveground.

IPEC00202953

Entergy	CONDITION REPORT	CR-IP2-1999-06192

Originator:	Tobler,George W	**Originator Phone:**	0
Originator Site Group:	IP2 PLNG-Work Control Staff	**Operability Required:**	Y
Supervisor Name:	MCMULLIN, KATHY	**Reportability Required:**	N
Discovered Date:	08/11/1999 00:00	**Initiated Date:**	08/11/1999 00:00

Condition Description:

CR Date: 08/11/1999 09:26
CR Entered Date: 08/11/1999 09:43
PT-A33 is the annual fuel oil hydro. This hydro is performed as a Coast Guard requirement to ensure there is no leakage to the environment. The test is a minus zero plus ten pound pressure variance acceptance criteria. This is due to the fact that a portion of the fuel piping runs underground. We currently are experiencing difficulty achieving a zero pressure drop condition. I would like to suggest that we dig up the underground piping which would allow us to pressurize the system to hydro pressure and perform an inspection of the pipe verify no external leakage. There is a significant increase in both cost and environmental risk with fuel truck deliverys. I feel that the savings in truck deliverys would eventually pay for the cost of digging up the pipe.

Immediate Action Description:

wrote crs

Suggested Action Description:

REFERENCE ITEMS:

Type Code	Item Desc
CR	199906206
CR	199906207
CR	199906216
DETECTION	II
LOCATION	N/A
TSN	PT-A33

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
OR	OR-TEST AND PERFORMANCE
KA	KA-EV
OP	OP-OB5
PR	PR-CORRECTIVE ACTION
HT	HT-KB
HE	HE-IS4
KA	KA-PP
PR	PR-ENGINEERING SUPPORT
OR	OR-SYSTEM ENGINEERING

IPEC00202954

IPEC00202954

Entergy	CORRECTIVE ACTION	CR-IP2-1999-06192

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	E-CAPTAIN, CRS
Assigned To:	IP2	ENG DE-Mech Proj & Prog Mgmt	Burbige,Lawrence J
Subassigned To :	IP2	ENG SYS-Balance of Plant Staff	OKUN, GINA

Originated By:	E-CAPTAIN, CRS	8/11/1999 00:00:00
Performed By:	Burbige,Lawrence J	8/19/1999 00:00:00
Subperformed By:	OKUN, GINA	8/19/1999 00:00:00
Approved By:		
Closed By:	Burbige,Lawrence J	8/19/1999 00:00:00

Current Due Date: 08/18/1999 **Initial Due Date:** 08/18/1999

CA Type: DISP - CORR ACTION

Plant Constraint: NONE

CA Description:

NOTE ONE-WEEK DUE DATE BECAUSE OF IMPENDING COAST GUARD INSPECTION 8/31/99. Please evaluate and recommend corrective actions. (cbh)

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	125743

Response:

Subresponse :

08/18/1999 Assigned to: OKUN, GINA Status: Closed + Approved

Action Requsted: Evaluate
Assignee Response: See SL Report

Significance Level 3 Report
PT-A33 test has been revised/updated to reflect 1)test enhancements in terms of data collection; and 2)operating experience and lessons learned from the first test. Operations, engineering, and t&p had sat down to refine this test and many comments have been incorporated. Digging up the underground piping does not appear to be feasible at this time. In addition to the leg of underground piping mentioned by the originator, there is still an "invisible" piece of piping from the screenwell house to the fuel oil unloading area and the fuel oil pipe is insulated, both of which prohibit us from declaring this line completely visible. I believe that the test enhancements will allow us to justify our test results and corrective actions (ie, maintenance work orders) could be generated because deficiencies can be confirmable.

Note that the 1 week due date for this is unreasonable, since we have been and still ARE in compliance with the coast guard's regulations for bulk fuel oil deliveries.

The originator of cr 199906207 suspects that we have a "pipe in a pipe" condition. At this time, there is no verbeage in the coast guard requirements which would allow us to take credit for this and there is no documentation available to conclude that we have presented this point. However, based on the pt-a33 new results achieved after the hydro, it may be beneficial to explore this avenue further with the coast guard through the company's bargemaster.

The overgrown brush mentioned in a referenced cr should be addressed before the station performs pt-a33 again (which will be within the next week or so). This appears to be a facilities job.

Closure Comments:

N/A

IPEC00202955

Entergy	CORRECTIVE ACTION	CR-IP2-1999-06192

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	E-CAPTAIN, CRS
Assigned To:	IP2	UNKNOWN	DOYLE, RICHARD J
Subassigned To :			

Originated By:	E-CAPTAIN, CRS	8/11/1999 00:00:00
Performed By:	DOYLE, RICHARD J	8/12/1999 00:00:00
Subperformed By:		
Approved By:		
Closed By:	DOYLE, RICHARD J	8/12/1999 00:00:00

Current Due Date: 08/18/1999 **Initial Due Date:** 08/18/1999

CA Type: CRS - FYI

Plant Constraint: NONE

CA Description:
FYI

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	125745

Response:

Subresponse :

Closure Comments:
N/A

IPEC00202956

IPEC00202956

Entergy	CORRECTIVE ACTION	CR-IP2-1999-06192

CA Number: 3

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	E-CAPTAIN, CRS
Assigned To:	IP2	TECH SUP-Environmental	Keppel,Roger G
Subassigned To :			

Originated By:	E-CAPTAIN, CRS	8/11/1999 00:00:00
Performed By:	Keppel,Roger G	2/24/2000 00:00:00
Subperformed By:		
Approved By:		
Closed By:	Keppel,Roger G	2/24/2000 00:00:00

Current Due Date: 08/18/1999 **Initial Due Date:** 08/18/1999

CA Type: CRS - FYI

Plant Constraint: NONE

CA Description:

FYI

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	125746

Response:

Subresponse :

Closure Comments:

N/A

IPEC00202957

IPEC00202957

Entergy	CORRECTIVE ACTION	CR-IP2-1999-06192

CA Number: 4

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	E-CAPTAIN, CRS
Assigned To:	IP2	ENG SYS-Balance of Plant Staff	OKUN, GINA
Subassigned To :			

Originated By:	E-CAPTAIN, CRS	8/11/1999 00:00:00
Performed By:	OKUN, GINA	8/18/1999 00:00:00
Subperformed By:		
Approved By:		
Closed By:	OKUN, GINA	8/18/1999 00:00:00

Current Due Date: 08/18/1999 **Initial Due Date:** 08/18/1999

CA Type: CRS - FYI

Plant Constraint: NONE

CA Description:
FYI

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	125747

Response:

Subresponse :

Closure Comments:
N/A

IPEC00202958

Entergy	CORRECTIVE ACTION	CR-IP2-1999-06192

CA Number: 5

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	E-CAPTAIN, CRS
Assigned To:	IP2	ENG DE-Mech Proj & Prog Mgmt	Burbige,Lawrence J
Subassigned To :			

Originated By:	E-CAPTAIN, CRS	8/19/1999 00:00:00
Performed By:	Burbige,Lawrence J	8/24/1999 00:00:00
Subperformed By:		
Approved By:		
Closed By:	Burbige,Lawrence J	8/24/1999 00:00:00

Current Due Date: 09/25/1999 **Initial Due Date:** 09/25/1999

CA Type: CR CLOSURE REVIEW

Plant Constraint: NONE

CA Description:

Follow up on corrective action assignments

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	126719

Response:

ICA complete

Subresponse :

Closure Comments:

N/A

IPEC00202959

IPEC00202959

Entergy	CORRECTIVE ACTION	CR-IP2-1999-06192

CA Number: 6

	Site	Group	Name
Assigned By:	IP2	ENG DE-Mech Proj & Prog Mgmt	Burbige,Lawrence J
Assigned To:	IP2	MAINT-Bldg & Grnds Staff	WEATHERFORD, TC
Subassigned To :			

Originated By:	Burbige,Lawrence J	8/19/1999 00:00:00
Performed By:	WEATHERFORD, TONI	8/23/1999 00:00:00
Subperformed By:		
Approved By:		
Closed By:	Burbige,Lawrence J	8/23/1999 00:00:00

Current Due Date: 08/26/1999 **Initial Due Date:** 08/26/1999

CA Type: PERFORM CA

Plant Constraint: NONE

CA Description:

Please remove grass/brush which prohibits our fuel oil line inspection. See referenced cr 199906206 and and associated work order 99-10517 that was generated.

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	126675

Response:

Action complete.

Subresponse :

Closure Comments:

N/A

IPEC00202960

IPEC00202960

Entergy	ADMIN	CR-IP2-1999-06192

Initiated Date: 8/11/1999 0:00 **Owner Site and Group:** IP2 ENG DE-Mech Proj & Prog Mgmt

Current Contact:

Current Significance: C - CORRECT ONLY

Closed by: e-CAPtain, CRS 2/24/2000 0:00

Summary Description:

199906192 - PT-A33 is the annual fuel oil hydro. This hydro is performed as a Coast Guard requirement to ensure there is no leakage to the environment. The test is a minus zero plus ten pound pressure variance acceptance criteria. This is due to the fact that a portion of the fuel piping runs underground. We currently are experiencing difficulty achieving a zero pressure drop condition. I would like to suggest that we dig up the underground piping which would allow us to pressurize the system

Remarks Description:

Closure Description:

PCRS Conversion

IPEC00202961

IPEC00202961

OperabilityVersion: 1
Operability Code: EQUIPMENT OPERABLE
Immediate Report Code: NOT REPORTABLE
Performed By: WATCH 08/11/1999 00:00
Approved By: WATCH 08/11/1999 00:00
Operability Description:
jb

OPERABILITY CHECK LIST:
Does the CR directly affect a structure, system or component (SSC) within the above list of applicability? No
Is the CR in an area, or interface with an SSC from the above list? No

Operability Check List Not Required.

REPORTABILITY CHECK LIST:

None.
Date / Time: 30-Dec-99 14:32
Notification Party: Operation Manager
Person Notified: J. Ferrick
Line:
Title:
Instructions:

Date / Time: 30-Dec-99 14:33
Notification Party: Plant Manager
Person Notified:
Line:
Title:
Instructions:

Date / Time: 31-Aug-99 14:35
Notification Party: NRC Inspector
Person Notified:
Line:
Title:
Instructions:

Date / Time: 31-Aug-99 16:00
Notification Party: NRC Hotline
Person Notified: Emergency Notification System
Line:
Title:
Instructions:

Date / Time: 31-Aug-99 16:10
Notification Party: Public Information
Person Notified: M. Spall
Line:
Title:
Instructions:

Date / Time: 31-Aug-99 16:12
Notification Party: ConEd CIG
Person Notified: CIG Operations Control
Line:

IPEC00202962

Title:
Instructions:

Date / Time: 31-Aug-99 16:20
Notification Party: NYPA
Person Notified: IP 3 CCR
Line:
Title:
Instructions:

Date / Time: 31-Aug-99 16:25
Notification Party: Notification By
Person Notified: D. Cornax
Line:
Title:
Instructions:

Approval Comments:

IPEC00202963

Entergy	ASSIGNMENTS	CR-IP2-1999-06192

Version: 1

Significance Code: C - CORRECT ONLY

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP2 ENG DE-Mech Proj & Prog Mgmt

Performed By: e-CAPtain, CRS 08/19/1999 00:00

Assignment Description:

Environmental issue raised by CAG 8/11/99 (cbh).

IPEC00202964

IPEC00202964

Entergy	CONDITION REPORT	CR-IP2-2002-10699

Originator: DeClemente,Vincent
Originator Phone: 5584
Originator Site Group: IP2 Operations Management Staff
Operability Required: N
Supervisor Name: Schoen,Peter S
Reportability Required: N
Discovered Date: 11/16/2002 03:45
Initiated Date: 11/16/2002 04:18

Condition Description:

While performing PT-3Y7, Pressure Decay Test Of Underground Condensate Piping, test pressure would decrease at a rate greater than acceptable. Pressure was dropping 5 psid in 1 minute, acceptable is 5 psid in 10 minutes. Suspect leakage was due to boundary valves.

Previous attempts of this test along with troubleshooting revealed LCV-1158 as a source of leak by. Subsequent maintenance was performed through stop adjustments, which ceased almost all leak by as proven by down stream pressure holding during further investigation of loss of test pressure.

To ensure an accurate test of the underground piping a TPC to the test was issued to modify the test boundary and test gauge placement. This resulted in an acceptable pressure drop of about 2 psid in 10 minutes while maintaining a valid test boundary on the required piping. The AFWP suction valves are experiencing leak by. Valves are normally open. This is not an operability issue. Reference CR IP2-02-9913 about test failure.

Immediate Action Description:

Outage Management Informed.
TPC developed.

Suggested Action Description:

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
CT-27			AFW
CT-30			AFW
LCV-1158			AFW

REFERENCE ITEMS:

Type Code	Item Desc
CAM	IP2-2002-9913
WON	IP2-02-02442
WON	IP2-02-02443

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
KEYWORDS	KW-LEAKAGE-VALVE
KEYWORDS	KW-TESTING

IPEC00202965

Entergy	ADMIN	CR-IP2-2002-10699

Initiated Date: 11/16/2002 4:18 **Owner Site and Group:** IP2 Operations Management Staff

Current Contact: Joe REynolds

Current Significance: C - CORRECT ONLY

Closed by: Reynolds,Joseph A 1/7/2003 8:09

Summary Description:

Remarks Description:

Closure Description:

Noted the CRG approved closure to the referenced work order, therefore CA&A applied key word trend codes and closed this CR.

IPEC00202966

IPEC00202966

OperabilityVersion: 1

Operability Code: EQUIPMENT INOPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Eagleton,Sean T 11/18/2002 04:46

Approved By: Baker,John R 11/18/2002 05:19

Operability Description:

The underground condensate piping did not satisfy the specified leakage criteria. The ability to maintain the required reserve inventory for Aux Feed may be threatened by this condition. Until the source, or sources of leakage are determined and/or corrected, the underground condensate piping is inoperable.

Approval Comments:

Subsequent testing was performed satisfactorily - equipment is not operable

IPEC00202967

Entergy	A S S I G N M E N T S	CR-IP2-2002-10699

Version: 1

Significance Code: C - CORRECT ONLY

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP2 Operations Management Staff

Performed By: Schmidt,George P 11/18/2002 12:11

Assignment Description:
close to wrt.

IPEC00202968

IPEC00202968

Entergy	CONDITION REPORT	CR-IP2-2005-03358

Originator: Bergren,Christopher J
Originator Phone: 8674
Originator Site Group: IP2 P&C Eng Codes Staff
Operability Required: Y
Supervisor Name: Azevedo,Nelson F
Reportability Required: Y
Discovered Date: 08/16/2005 12:42
Initiated Date: 08/16/2005 12:57

Condition Description:

PT-3Y9, Flow Test for Underground Service Water line 408, failed to meet acceptance criteria.

Immediate Action Description:

There are no specific criteria regarding this test contained in Technical Specifications or any other licensing basis document. The test criteria was developed as one method of meeting a leakage examination requirement under ASME Section XI, IWV-5000. Alternate methods of meeting the same requirement can be evaluated and implemented prior to the "drop dead" date for the examination which is currently 5/14/06 (the end of 2R17). Since the requirement has not been met, the requirement remains OPEN under the Inservice Inspection Program for tracking purposes. Code Programs is tasked with closing the open item.

In this examination, SW pump flow values are totalized on the Essential Header and compared with expectations derived from pump curves based on SW pump discharge pressures. These values may vary widely based on current throttle positions, inter-system leakage, calibration of installed instrumentation and other factors.

The results of this test do not indicate any problem with the Service Water System which remains in the same operable status that pertained to the system prior to the conduct of the test. The basis for this conclusion is that the SW system is checked quarterly to verify accident flow rates at the Fan Cooler Units with the TCV-1104 and 1105 valves open. SW pumps are tested quarterly and currently all operating acceptably. All required loads are being cooled acceptably at this time. Therefore, there are no indications from these required tests and normal system operation that there is any flow rate problem with the essential header.

Suggested Action Description:

Evaluate for further action as required.(P&CE, Code Programs).

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
			SW

REFERENCE ITEMS:

Type Code	Item Desc
TSN	PT-3Y9

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
REPORT WEIGHT	1
KEYWORDS	KW-SURVEILLANCE
ES	ESPC
	ID3P

Attachments:

Condition Reportription

USER GENERATED PDF : 08/27/009 07:36:13

~~Condition Reportription~~

IPEC00202969

IPEC00202969

Attachments:

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IPEC00202970

Entergy	CORRECTIVE ACTION	CR-IP2-2005-03358

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	CRG/CARB/OSRC	Harrison,Christine B
Assigned To:	IP2	P&C Eng Codes Mgmt	Azevedo,Nelson F
Subassigned To :	IP2	P&C Eng Codes Staff	Bergren,Christopher J

Originated By:	Harrison,Christine B	8/18/2005 12:46:28
Performed By:	Azevedo,Nelson F	9/6/2005 13:58:03
Subperformed By:	Bergren,Christopher J	9/6/2005 09:26:38
Approved By:		
Closed By:	Azevedo,Nelson F	9/6/2005 13:58:03

Current Due Date: 09/06/2005 **Initial Due Date:** 09/08/2005

CA Type: DISP - CA

Plant Constraint: #NONE

CA Description:

Please review and assign further corrective actions as required.

Response:

See sub response below.

Subresponse :

The IP2 procedure and IP3 procedure have different acceptance criteria. The code has no specific acceptance criteria and simply indicates that the owner shall specify an acceptance criteria (IWA 5244(a)) for flow difference. A corrective action is assigned to Code Programs staff to provide a consistant approach for testing and revise the procedures accordingly. As stated in the body of the initial condition report, there is no apparent problem with the Service Water system at this time. The system has been meeting cooling requirements during a period of elevated temperatures with the River Water support system out of service.

Closure Comments:

IPEC00202971

IPEC00202971

Entergy	CORRECTIVE ACTION	CR-IP2-2005-03358

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Staff	Bergren,Christopher J
Assigned To:	IP2	P&C Eng Codes Staff	Bergren,Christopher J
Subassigned To :			

Originated By:	Bergren,Christopher J	9/6/2005 09:25:04
Performed By:	Bergren,Christopher J	10/17/2005 12:33:52
Subperformed By:		
Approved By:		
Closed By:	Bergren,Christopher J	10/17/2005 12:33:52

Current Due Date: 10/21/2005 **Initial Due Date:** 10/21/2005

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Evaluate testing variation between IPEC ISI pressure test program for underground lines. Determine a suitable common approach. Document the basis for the final approach. Implement necessary procedure change.

Response:

Evaluated differences between Units in ISI pressure tests for same underground piping. IP3 uses a larger plus/minus 15 per cent criteria and IP2 uses plus/minus 3 per cent. The ASME Code does not specify any particular value of acceptance criteria when performing flow tests. The Owner is to specify acceptance. Other indicators of piping condition were discussed with the System Engineer. The line in question was fully inspected visually (internal) during 2R15 with no anomalies found. After discussion, it was determined that the acceptance criteria for both sites shall be the same which is plus/minus 15%. This was requested via feedback to Operations Procedure Group and the IP2 test was revised for the alternate underground line. The test subsequently was performed satisifactorily. Both underground lines meet the latest requirement and the piping remains operable. No additional actions are needed in this case.

Chris Bergren
IPEC IST

Subresponse :

Closure Comments:

IPEC00202972

IPEC00202972

Entergy	CORRECTIVE ACTION	CR-IP2-2005-03358

CA Number: 3

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	Schmidt,George P
Assigned To:	IP2	P&C Eng Codes Mgmt	Azevedo,Nelson F
Subassigned To :			

Originated By:	Jowitt,Roseann	10/17/2005 13:55:24
Performed By:	Azevedo,Nelson F	10/18/2005 12:38:01
Subperformed By:		
Approved By:		
Closed By:	Lewandowski,Paul R	10/18/2005 14:34:54

Current Due Date: 10/24/2005 **Initial Due Date:** 10/24/2005

CA Type: CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

CAT-C, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE READY TO CLOSE. REVIEW CR AND Approve / Disapprove CLOSURE IN ACCORDANCE WITH EN-LI-102, SECTION 5.9.

Response:

This CR is ready for closure since the IP2 procedure has been updated to reflect the more liberal acceptance criteria of +/- 15% as used by IP3 and allowed by the ASME Code.

Subresponse :

Closure Comments:

Per CA&A review, noted the Assignee recommendation to close the CA and the CR and the response(s) addressed the CR issue, therefore this CA is closed and the CR will be closed.

IPEC00202973

IPEC00202973

Entergy	ADMIN	CR-IP2-2005-03358

Initiated Date: 8/16/2005 12:57 **Owner Site and Group:** IP2 P&C Eng Codes Mgmt

Current Contact:

Current Significance: C - REVIEW & CORRECT

Closed by: Lewandowski,Paul R 10/18/2005 14:35

Summary Description:

PT-3Y9, Flow Test for Underground Service Water line 408, failed to meet acceptance criteria.

Remarks Description:

Closure Description:

Per CA&A review, noted the Assignee recommendation to close the CR and the response(s) addressed the CR issue, therefore this CR is closed.

IPEC00202974

IPEC00202974

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Ready Jr,James D 08/16/2005 14:21

Approved By: Primrose,Eugene 08/16/2005 20:46

Operability Description:

Code Engineering provided the following input:

There are no specific criteria regarding this test contained in Technical Specifications or any other licensing basis document. The test criteria was developed as one method of meeting a leakage examination requirement under ASME Section XI, IWV-5000. Alternate methods of meeting the same requirement can be evaluated and implemented prior to the "drop dead" date for the examination which is currently 5/14/06 (the end of 2R17). Since the requirement has not been met, the requirement remains OPEN under the Inservice Inspection Program for tracking purposes. Code Programs is tasked with closing the open item.

In this examination, SW pump flow values are totalized on the Essential Header and compared with expectations derived from pump curves based on SW pump discharge pressures. These values may vary widely based on current throttle positions, inter-system leakage, calibration of installed instrumentation and other factors.

The results of this test do not indicate any problem with the Service Water System which remains in the same operable status that pertained to the system prior to the conduct of the test. The basis for this conclusion is that the SW system is checked quarterly to verify accident flow rates at the Fan Cooler Units with the TCV-1104 and 1105 valves open. SW pumps are tested quarterly and currently all operating acceptably. All required loads are being cooled acceptably at this time. Therefore, there are no indications from these required tests and normal system operation that there is any flow rate problem with the essential header.

Based on this information this test does not identify a condition which renders the Service Water system inoperable. Ongoing investigation by the Code Engineering is occuring to determine a more feasible way of testing this underground line to elliminate uncertainities.

Approval Comments:

Approved

IPEC00202975

Version: 1

Significance Code: C - REVIEW & CORRECT

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP2 P&C Eng Codes Mgmt

Performed By: Harrison,Christine B 08/18/2005 12:45

Assignment Description:

IPEC00202976

IPEC00202976

Entergy	REPORTABILITY	CR-IP2-2005-03358

Reportability Version: 1

Report Number:

Report Code: NOT REPORTABLE

Boilerplate Code:

Performed By : Janicki,John W 08/22/2005 10:32

Reportability Description:

Per the IST engineer this is a Section XI tracking item. The system performance is not affected. Another methodology for closing the tracking item will be developed. Not reportable per IP-SMM-LI-108.

IPEC00202977

Entergy	CONDITION REPORT	CR-IP2-2006-00039

Originator: White,Edson N
Originator Phone: 3280
Originator Site Group: IP2 MAINT-Mech Staff
Operability Required: N
Supervisor Name: Carson Jr,Thomas E
Reportability Required: N
Discovered Date: 01/05/2006 15:51
Initiated Date: 01/05/2006 15:55

Condition Description:

During performance of troubleshooting on GT 3 low fuel oil supply pressure, working with Piping and instrumentation drawing, Fuel forwarding system flow diagram 304122 Rev 05, we attempted to dead head a section of piping in order to determine pump discharge pressures and losses. One section of underground piping showed no change in pump discharge pressure with the discharge piping isolated. A leak in this section of piping was suspected and troubleshooting was discontinued, the pump was secured and the supply of oil to the piping was secured. There was no external indication of fuel leakage.

Notification of this suspected leak was made to the FSS and SM. Shortly after these notifications were made, Westinghouse print 4494D19, W191/W-251AA Gas Turbine Plant Fuel FWDG system - field piping was reviewed. This drawing shows a discrepancy with the aforementioned drawing in that the one of the pipes going underground does not reconnect to the supply piping as indicated in 304122, this line connects underground to the recirculation piping. Having a line open to recirculation explains the lack of pressure in the piping. A leak in this line is no longer suspected, this condition report is to document the drawing discrepancy. A former system engineer for the Gas turbine system supplied the Westinghouse print and confirmed that it is the correct for the recirc piping set up.

Immediate Action Description:

Wrote CR.

Suggested Action Description:

A corrective action for design engineering to revise Drawing 304122 rev 5

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
		PIP	GT

REFERENCE ITEMS:

Type Code	Item Desc
DWG	304122
DWG	4494D19
WON	IP2-06-11656 Y

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
CU	ESDE
CB	ESDE
KEYWORDS	KW-DRAWING ERROR
REPORT WEIGHT	1

IPEC00202978

IPEC00202978

Entergy	CORRECTIVE ACTION	CR-IP2-2006-00039

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	CRG/CARB/OSRC	Harrison,Christine B
Assigned To:	IP2	MAINT-Mech Mgmt	Parker,David A
Subassigned To :	IP2	MAINT-Mech Staff	White,Edson N

Originated By:	Harrison,Christine B	1/10/2006 11:10:42
Performed By:	Ferretti,Michael D	1/30/2006 13:11:44
Subperformed By:	White,Edson N	1/30/2006 13:06:18
Approved By:		
Closed By:	Ferretti,Michael D	1/30/2006 13:11:44

Current Due Date: 02/01/2006 **Initial Due Date:** 02/01/2006

CA Type: DISP - CA

Plant Constraint: #NONE

CA Description:

Please ensure an Engineering Request is initiated for the identified drawing deficiency and assign further corrective actions as required.

Response:

See sub response.

Subresponse :

Engineering request IP2-06-11656 has been entered for this drawing revision.

Closure Comments:

IPEC00202979

IPEC00202979

Entergy	CORRECTIVE ACTION	CR-IP2-2006-00039

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	MAINT-Mech Mgmt	Parker,David A
Assigned To:	IP2	CA&A Staff	Jowitt,Roseann
Subassigned To :			

Originated By:	Ferretti,Michael D	1/30/2006 13:13:54
Performed By:	Lewandowski,Paul R	1/30/2006 13:22:20
Subperformed By:		
Approved By:		
Closed By:	Lewandowski,Paul R	1/30/2006 13:22:39

Current Due Date: 03/01/2006 **Initial Due Date:** 03/01/2006

CA Type: CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

CAT-C; This Condition Report has been reviewed for closure in accordance with EN-LI-102, Section 5.9. All Corrective Actions have been satisfactorily completed and no additional Corrective Actions are required. Please close this Condition Report.

Response:

Per CA&A review, noted the Assignee recommendation to close the CA and the CR and the referenced WO is open with PCRS flag=Y, status = ERORIG , therefore this CA is closed and the CR will be closed.

Subresponse :

Closure Comments:

IPEC00202980

Entergy	ADMIN	CR-IP2-2006-00039

Initiated Date: 1/5/2006 15:55 **Owner Site and Group:** IP2 MAINT-Mech Mgmt

Current Contact:

Current Significance: C - REVIEW & CORRECT

Closed by: Lewandowski,Paul R 1/30/2006 13:24

Summary Description:

During performance of troubleshooting on GT 3 low fuel oil supply pressure, working with Piping and instrumentation drawing, Fuel forwarding system flow diagram 304122 Rev 05, we attempted to dead head a section of piping in order to determine pump discharge pressures and losses. One section of underground piping showed no change in pump discharge pressure with the discharge piping isolated. A leak in this section of piping was suspected and troubleshooting was discontinued, the pump was secured and the supply of oil to the piping was secured. There was no external indication of fuel leakage.

Notification of this suspected leak was made to the FSS and SM. Shortly after these notifications were made, Westinghouse print 4494D19, W191/W-251AA Gas Turbine Plant Fuel FWDG system - field piping was reviewed. This drawing shows a discrepancy with the aforementioned drawing in that the one of the pipes going underground does not reconnect to the supply piping as indicated in 304122, this line connects underground to the recirculation piping. Having a line open to recirculation explains the lack of pressure in the piping. A leak in this line is no longer suspected, this condition report is to document the drawing discrepancy. A former system engineer for the Gas turbine system supplied the Westinghouse print and confirmed that it is the correct for the recirc piping set up.

Remarks Description:

Closure Description:

Per CA&A review, noted the Assignee recommendation to close the CR and the referenced WO is open with PCRS flag=Y, therefore this CR will be closed.

IPEC00202981

IPEC00202981

Version: 1

Significance Code: C - REVIEW & CORRECT

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP2 MAINT-Mech Mgmt

Performed By: Harrison,Christine B 01/10/2006 11:09

Assignment Description:

IPEC00202982

Entergy	CONDITION REPORT	CR-IP2-2008-04691

Originator:	Norton,Gary A	**Originator Phone:**	6644
Originator Site Group:	IP2 QA Audits Mgmt IP2	**Operability Required:**	Y
Supervisor Name:	Inzirillo,Frank A	**Reportability Required:**	Y
Discovered Date:	10/20/2008 13:55	**Initiated Date:**	10/20/2008 14:00

Condition Description:

Work order 00164495 task 07 EXCAVATE GROUND NEAR CST TO SUPPORT PIPE INSPECTION does not address seismic concerns encountered when excavating under piping. As per engineering REFER TO IP3 9321-F-14733, 22433, FOR CST PIPING SIZE 8, 10 & 12", THE UNSUPPORT SPAN IS 16' TO 17'. IN COMPARISON TO IP3 CST PIPING, THEREFORE 16' UNSUPPORT SPAN FOR IP2 IS ACCEPTABLE. The work package should have considered this prior to commencing work.

Immediate Action Description:

requested support from engineering and added their statement.

Suggested Action Description:

major projects work should be worked within the 12 week schedule with all approiate reviews.

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
CST	HCLM/SR/MR	ACCUMU	AFW

REFERENCE ITEMS:

Type Code	Item Desc
CARB-ACCEPT	120208
CR	IP2-2008-04706
CR	IP2-2008-04862
DWG	IP3 9321-F-14733
DWG	22433
WON	00164495

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
KEYWORDS	KW-SEISMIC SUPPORT
INPO BINNING	ER4
KEYWORDS	KW-PIPE SUPPORT
HEP FACTOR	P
KEYWORDS	KW-CONDENSATE
REPORT WEIGHT	2
AJ	MAPP
KEYWORDS	KW-QA
HU I-QUESTIONING ATTITUDE	MAMS
HU L-PROCEDURES	MAMS
HU T-TIME PRESSURE	MAMS
CAUSAL FACTOR	WP4A
HU P-KNOWLEDGE	MAMS
CAUSAL FACTOR	OP5U

IPEC00202983

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
CAUSAL FACTOR	WP3E
HU M-CLEAR, WELL COMMUNICATED EXPECTATIONS	MAMS
HU S-CLEAR PERFORMANCE STANDARDS	MAMS
HU I-PROCEDURE USE & ADHERENCE	MAMS
HU T-VAGUE GUIDANCE	MAMS
GRADE ACE	21.3

IPEC00202984

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04691

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	CRG/CARB/OSRC IP2	Harrison,Christine B
Assigned To:	IP2	MAINT-Support Mgmt IP2	Manley,Mark P
Subassigned To :			

Originated By:	Harrison,Christine B	10/27/2008 09:39:41
Performed By:	Trombetta,Robert G	11/18/2008 11:55:04
Subperformed By:		
Approved By:		
Closed By:	Reynolds,Joseph A	11/18/2008 14:21:57

Current Due Date: 11/19/2008 **Initial Due Date:** 11/19/2008

CA Type: DISP - ACE/LT

Plant Constraint: #NONE

CA Description:

Please perform lower-tier apparent cause evaluation, including CR-IP2-2008-04706 (Condition Description copied below), and assign further corrective actions as required. Note that your evaluation is to be presented to CARB and a corrective action is being assigned to CA&A to document this presentation.

CR-IP2-2008-04706: "Work order 00164495 for CST underground piping inepection was taken to a ready status without going through Operations review process. Work was implemented without being on the station schedule."

Response:

Performed Apparent Cause Evaluation and Level 2 HPER and assigned CA & trend codes. See attached reports

Subresponse :

Closure Comments:

Per CAA review, noted the ACE report addressed all expected discussion points, therefore the response was accepted pending CARB review. CA# 2 assigned to document the results of the CARB review, therefoer this completed action closed.

Attachments:

Resp Description

HPER

ACE

IPEC00202985

IPEC00202985

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04691

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	CA&A Staff IP2	Harrison,Christine B
Assigned To:	IP2	CA&A Staff IP2	Harrison,Christine B
Subassigned To :			

Originated By:	Harrison,Christine B	10/27/2008 09:40:42
Performed By:	Harrison,Christine B	12/2/2008 14:18:36
Subperformed By:		
Approved By:		
Closed By:	Harrison,Christine B	12/2/2008 14:18:36

Current Due Date: 01/22/2009 **Initial Due Date:** 01/22/2009

CA Type: CARB REVIEW

Plant Constraint: #NONE

CA Description:

Document the results of the apparent cause evaluation presentation to CARB.

Response:

The Category B Report was presented to, and accepted as-is by, the CARB on 12/2/08 with an average grade of 21.3.

Subresponse :

Closure Comments:

IPEC00202986

IPEC00202986

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04691

CA Number: 3

	Site	Group	Name
Assigned By:	IP2	CRG/CARB/OSRC IP2	Harrison,Christine B
Assigned To:	IP2	MAINT-Support Mgmt IP2	Manley,Mark P
Subassigned To :			

Originated By:	Harrison,Christine B	10/31/2008 09:12:20
Performed By:	Scavetta,Paul M	10/31/2008 09:30:19
Subperformed By:		
Approved By:		
Closed By:	Scavetta,Paul M	10/31/2008 09:30:19

Current Due Date: 11/19/2008 **Initial Due Date:** 11/19/2008

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Include CR-IP2-2008-04862 (Condition Description copied below) in your apparent cause evaluation assigned under this CR:

"W.O. 164495-04 for coating C.S.T. piping brought to ready status without Ops. approval."

Response:

Included CR-IP2-2008-04862 (Condition Description copied below) in your apparent cause evaluation assigned under this CR:

"W.O. 164495-04 for coating C.S.T. piping brought to ready status without Ops. approval."

Subresponse :

Closure Comments:

IPEC00202987

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04691

CA Number: 4

	Site	Group	Name
Assigned By:	IP2	MAINT-Support Mgmt IP2	Trombetta,Robert G
Assigned To:	IP2	MAINT-Support Mgmt IP2	Manley,Mark P
Subassigned To :			

Originated By:	Trombetta,Robert G	11/18/2008 11:46:00
Performed By:	Trombetta,Robert G	12/8/2008 15:14:10
Subperformed By:		
Approved By:		
Closed By:	Trombetta,Robert G	12/8/2008 15:14:10

Current Due Date: 12/15/2008 **Initial Due Date:** 12/15/2008

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Ensure all Planners and Supervisors reporting to Maintenance Support understand the requirement for Operation's review and assessment of work task activities

Response:

The requirement for operations review and assessment of scheduled work activities was reinforced at the weekly tailgate and staff meeting.

Subresponse :

Closure Comments:

IPEC00202988

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04691

CA Number: 5

	Site	Group	Name
Assigned By:	IP2	MAINT-Support Mgmt IP2	Trombetta,Robert G
Assigned To:	IP2	MAINT-Support Mgmt IP2	Scavetta,Paul M
Subassigned To :			

Originated By:	Trombetta,Robert G	11/18/2008 11:47:48
Performed By:	Scavetta,Paul M	11/21/2008 08:16:30
Subperformed By:		
Approved By:		
Closed By:	Scavetta,Paul M	11/21/2008 08:16:30

Current Due Date: 12/15/2008 **Initial Due Date:** 12/15/2008

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Verify Maintenance Support work tasks in the protected area are included or merged into the12 week schedule.

Response:

Verified current Maintenance Support work tasks in the protected area are in station schedule. This is now the standard for all future MNTS work performed inside the protected area.

Subresponse :

Closure Comments:

IPEC00202989

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04691

CA Number: 6

	Site	Group	Name
Assigned By:	IP2	CA&A Staff IP2	Reynolds,Joseph A
Assigned To:	IP2	MAINT-Support Mgmt IP2	Manley,Mark P
Subassigned To :			

Originated By:	Jowitt,Roseann	12/9/2008 06:44:49
Performed By:	Trombetta,Robert G	12/10/2008 13:20:47
Subperformed By:		
Approved By:		
Closed By:	Reynolds,Joseph A	12/10/2008 14:30:28

Current Due Date: 12/18/2008 **Initial Due Date:** 12/18/2008

CA Type: CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

CAT-B, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE READY TO CLOSE. REVIEW CR AND APPROVE / DISAPPROVE CLOSURE IN ACCORDANCE WITH EN-LI-102, SECTION 5.9.

Response:

CAT-B, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE CLOSED. APPROVE CLOSURE IN ACCORDANCE WITH EN-LI-102, SECTION 5.9.

Subresponse :

Closure Comments:

Per CAA review, noted the CR owner recommended and approved the closure of the CR.

IPEC00202990

Entergy	ADMIN	CR-IP2-2008-04691

Initiated Date: 10/20/2008 14:00 **Owner Site and Group:** IP2 MAINT-Support Mgmt IP2

Current Contact: Joe Reynolds

Current Significance: B

Closed by: Reynolds,Joseph A 12/10/2008 14:31

Summary Description:

Work order 00164495 task 07 EXCAVATE GROUND NEAR CST TO SUPPORT PIPE INSPECTION does not address seismic concerns encountered when excavating under piping. As per engineering REFER TO IP3 9321-F-14733, 22433, FOR CST PIPING SIZE 8, 10 & 12", THE UNSUPPORT SPAN IS 16' TO 17'. IN COMPARISON TO IP3 CST PIPING, THEREFORE 16' UNSUPPORT SPAN FOR IP2 IS ACCEPTABLE. The work package should have considered this prior to commencing work.

Remarks Description:

Closure Description:

Per CAA review, acknowledge the CR owner (Maintenance Support) recommendation and approval to close the CR. The CR issue "Work order 00164495 task 07 EXCAVATE GROUND NEAR CST TO SUPPORT PIPE INSPECTION does not address seismic concerns encountered when excavating under piping. As per engineering REFER TO IP3 9321-F-14733, 22433, FOR CST PIPING SIZE 8, 10 & 12", THE UNSUPPORT SPAN IS 16' TO 17'. IN COMPARISON TO IP3 CST PIPING, THEREFORE 16' UNSUPPORT SPAN FOR IP2 IS ACCEPTABLE. The work package should have considered this prior to commencing work." resolution was captured, therefore CAA noted the trend codes applied and then closed the CR.

IPEC00202991

Entergy	OPERABILITY	CR-IP2-2008-04691

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Schoen,Peter S 10/20/2008 16:19

Approved By: Baker,John R 10/20/2008 16:55

Operability Description:

Based on below information received from Design Engineering, CST piping for the Unit 2 CST is operable:

Unit 2 has three buried pipes from Condensate Storage Tanks as follows. (Ref Dwg NOs. 9321-2018, 250073, 9321-2263)

1. 10" Dia Overflow Line Drain Pipe: This line has a thickness of Sch 20 per Piping Specification 9321-01-248-18, Class C-3.
2. 8" Dia Return Line to Condensate Storage Tank. This line (Line no. 1509) has connections from AFW discharge piping recirculation lines. This line has a thickness of Sch 40 per Piping Specification 9321-01-248-18, Class C-1.
3. 12" Dia suction line for AFW pumps. This line (Line No. 1505) has a thickness of Sch 20 per Piping Specification 9321-01-248-18, Class C-3.

Unit 3 has three buried pipes from Condensate Storage Tanks as follows.

1. 8" Dia Overflow Line Drain Pipe: This line has a thickness of Sch 20 per Piping Specification TS-MS-024, Class C-3.
2. 8" Dia Return Line to Condensate Storage Tank. This line has connections from AFW discharge piping recirculation lines. This line has a thickness of Sch 40 per Piping Specification TS-MS-024, Class C-1.
3. 12" Dia suction line for AFW pumps. This line has a thickness of Sch 20 per Piping Specification TS-MS-024, Class C-3.

Unit 3 pipes are above ground and unsupported span is 16 to 17 feet. The ground spectra motions are less than 1.0G and same for both the units. It is acceptable to have a unsupported span of 16 to 17 feet for unit 2 piping. The actual excavated portion of piping is not more than 10 feet. The Unit 2 condition in the field for the exposed pipes is acceptable based on the enveloped design condition in Unit 3.

Approval Comments:

Approved

IPEC00202992

Version: 1

Significance Code: B

Classification Code: LT-ACE CARB

Owner Site and Group: IP2 MAINT-Support Mgmt IP2

Performed By: Harrison,Christine B 10/27/2008 10:17

Assignment Description:

IPEC00202993

Entergy	REPORTABILITY	CR-IP2-2008-04691

Reportability Version: 1

Report Number:

Report Code: NOT REPORTABLE

Boilerplate Code:

Performed By : Rokes,Charles B 10/27/2008 07:50

Reportability Description:

Recorded condition does not meet reporting criteria of SMM-LI-108 based on an assessment by Design Engineering concluding the CST piping for the Unit 2 CST is operable.

IPEC00202994

IPEC00202994

ATTACHMENT 9.6 — **LEVEL 2 HPERS DOCUMENTATION**

Sheet 1 of 1

CR No:CR-IP2-2008-04691

APPLICABLE HU TRAPS:

- ☒ Time Pressure
- ☐ Distraction/Interruption
- ☐ Multiple Tasks
- ☐ Overconfidence
- ☒ Vague Guidance
- ☐ First Shift/Late Shift
- ☐ Peer Pressure
- ☐ Change/Off-Normal
- ☐ Physical Environment
- ☐ Mental Stress

WORKER TOOLS: (Mark which tools were not used or used ineffectively)

- ☒ Procedure Use/Adherence
- ☐ Placekeeping
- ☐ Verbal Communication
- ☐ Written Communication
- ☐ Concurrent Verification
- ☐ Self-Checking
- ☐ Peer Checking
- ☐ Knowledge/Training
- ☐ Take Two/Safety Minute
- ☐ Independent Verification
- ☐ Job Briefing
- ☐ Turnover
- ☐ Coaching
- ☒ Questioning Attitude

SUPERVISOR TOOLS: (Mark which tools were not used or used ineffectively)

- ☐ Worker Properly Qualified
- ☐ Priority and Focus Established
- ☐ Error Traps Considered
- ☐ Support Management Expectations
- ☐ Roles and Responsibilities
- ☐ Contingencies Planned
- ☐ Accountability
- ☐ Lead By Example
- ☐ Coaching
- ☒ Clear Performance Standards

MANAGEMENT TOOLS: (Mark which tools were not used or used ineffectively)

- ☐ Well Communicated Plans
- ☐ Clear Consistent Priorities
- ☒ Clear, Well Communicated Expectations
- ☐ Change Management
- ☐ Resource Allocation
- ☐ Elimination of Non-Productive Barriers
- ☐ Promoting a Self-Critical Culture
- ☐ Learning Environment
- ☐ Coaching
- ☐ Visible Sponsorship of Error Reduction and Risk Management

Latent Organizational Weaknesses: (Mark which LOWs contributed to the issue)

- ☐ Training/Qualification
- ☐ Maintenance/Testing
- ☐ Work Planning and Scheduling
- ☐ Procedures and Documents
- ☐ Values and Norms
- ☐ Resources Management
- ☐ Displays and Labels
- ☐ Environmental Conditions
- ☐ Change Management
- ☐ Human Factors/Ergonomics

CORRECTIVE ACTIONS:

- ☒ Coached above behaviors.
- ☐ Coached above behaviors, no other actions necessary.
- ☐ Immediate Corrective Actions: (list)
- ☒ Additional Corrective Actions if necessary.

☐ Skill ☐ Rule ☒ Knowledge

Reviewer: R. Trombetta	Date Completed: 11/6/ 2008

IPEC00202995

CR- IP2-2008-04961 **Maintenance Support**

PROBLEM STATEMENT: *(The **WHAT**) (see Procedure step 5.4[2](a))*

Work activities were started on WO 00164495 task 7 to excavate Unit 2 CST buried piping without Operations review.

Does this ACE report require an Equipment Failure Evaluation (EFE)?
(See procedure steps 5.4 [2] (b) and 5.5)

☐ Yes ☒ No

IF Yes, THEN complete Attachment 9.7 Equipment Failure Evaluation **AND** attach in PCRS

IF No, THEN an EFE analysis is not required.

Was an HPER performed for this CR?

(See procedure step 5.4 [2] (b))

☒ Yes ☐ No

IF Yes, THEN ensure results of the EN-HU-103 HPER are discussed in the Explanation of Problem section.

EXPLANATION OF PROBLEM: (*The **HOW***) *(see Procedure step 5.4[2](c))*

Please perform lower-tier apparent cause evaluation, including CR-IP2-2008-04706 (Condition Description copied below), and assign further corrective actions as required. Note that your evaluation is to be presented to CARB and a corrective action is being assigned to CA&A to document this presentation.

CR-IP2-2008-04706: "Work order 00164495 for CST underground piping inspection was taken to a ready status without going through Operations review process. Work was implemented without being on the station schedule

Condition Reports Associated or closed to this Condition Report:

CR-IP2-2008-04691**:**
*Condition Description**:***
Work order 00164495 task 07 EXCAVATE GROUND NEAR CST TO SUPPORT PIPE INSPECTION does not address seismic concerns encountered when excavating under piping. As per engineering REFER TO IP3 9321-F-14733, 22433, FOR CST PIPING SIZE 8, 10 & 12", THE UNSUPPORT SPAN IS 16' TO 17'. IN COMPARISON TO IP3 CST PIPING, THEREFORE 16' UNSUPPORT SPAN FOR IP2 IS ACCEPTABLE. The work package should have considered this prior to commencing work.

IPEC00202996

Immediate Action Description:
Requested support from engineering and added their statement.

Suggested Action:
Major projects work should be worked within the 12 week schedule with all appropriate reviews.

Operability Review:
Based on below information received from Design Engineering, CST piping for the Unit 2 CST is operable:

Unit 2 has three buried pipes from Condensate Storage Tanks as follows. (Ref Dwg NOs. 9321-2018, 250073, 9321-2263)

1. 10" Dia Overflow Line Drain Pipe: This line has a thickness of Sch 20 per Piping Specification 9321-01-248-18, Class C-3.
2. 8" Dia Return Line to Condensate Storage Tank. This line (Line no. 1509) has connections from AFW discharge piping recirculation lines. This line has a thickness of Sch 40 per Piping Specification 9321-01-248-18, Class C-1.
3. 12" Dia suction line for AFW pumps. This line (Line No. 1505) has a thickness of Sch 20 per Piping Specification 9321-01-248-18, Class C-3.

Unit 3 has three buried pipes from Condensate Storage Tanks as follows.

1. 8" Dia Overflow Line Drain Pipe: This line has a thickness of Sch 20 per Piping Specification TS-MS-024, Class C-3.
2. 8" Dia Return Line to Condensate Storage Tank. This line has connections from AFW discharge piping recirculation lines. This line has a thickness of Sch 40 per Piping Specification TS-MS-024, Class C-1.
3. 12" Dia suction line for AFW pumps. This line has a thickness of Sch 20 per Piping Specification TS-MS-024, Class C-3.

Unit 3 pipes are above ground and unsupported span is 16 to 17 feet. The ground spectra motions are less than 1.0G and same for both the units. It is acceptable to have a unsupported span of 16 to 17 feet for unit 2 piping. **The actual excavated portion of piping is not more than 10 feet. The Unit 2 condition in the field for the exposed pipes is acceptable based on the enveloped design condition in Unit 3.**

Conclusion for CR-IP2-2008-04691:
The excavation under the buried pipe was acceptable. It is indeterminate if an operations review (assessment) of the work order task would have identified the seismic concerns regarding unsupported spans.

CR-IP2-2008-04862:
Condition Description:
W.O. 164495-04 for coating C.S.T. piping brought to ready status without Operations approval. The below narrative includes this and *CR-IP2-2008-04706.*

Narrative:

The excavation of the CST underground piping is an ISE project that was fast tracked through Maintenance Support to allow for engineering inspection. The project required completion prior to 12/31/2008 and excavation in advance of winter weather.

WO 00164495 was created to "Inspect Unit 2 CST buried pipe" on 9/9/08 by a Maintenance Support planner and brought to PLAN and ACTIVE status. On 9/10/ 08 the WO was brought back to PLAN, moved to H/APPR and brought back to active status.
Requisition 01705779 was created on 9/16/08 for Shaw support in performing the excavation.
Task 7 was created to "Excavate ground near CST to support pipe inspection" on 9/18/08 and moved from PLAN to APPROVE and to READY by the planner. The assigned Shaw supervisor brought the task to WORKING on 9/ 23/08.
Also W.O. 164495-04 for coating C.S.T. piping was brought to ready status without Operations approval or assessment.

When interviewed the Maintenance Support planner explained that the job supervisors were anxious to start work and that there was a perceived schedule pressure to move the WO along to READY status. No one directed the planner to bypass the operations review but he believed that it was acceptable provided normal excavation protocols were in effect such as calling NYS Dig Hotline, using ground penetrating radar, shoring and following confined space guidelines.
Additionally the INDUS Passport system allowed for the planner to change the status without routing to operation for approval. This is allowable provided the task has a previous Operation assessment (example: a PM or other rep task). These work task did not have a previous assessment performed

This work was also outside of the 12 week schedule and not on the daily change sheet thus missing another opportunity to have the task screened for operational impact.

IPEC00202998

Human Performance:
A level 2 HPER was performed.

HU traps: Time pressure and vague guidance

Worker Tools not used effectively: Procedure use and adherence and questioning attitude

Supervisors Tools not used effectively: Provide clear performance Standards
Management Tools not used effectively: Clear, Well communicated expectations.

Conclusion:
The combination of the planner not routing the task to operations and the WO not being on the 12 week schedule precluded the opportunity for an OPS review and risk assessment.

APPARENT/CONTRIBUTING CAUSE(S): (*The **WHY***) *(see Procedure step 5.4[2](d))*

The Why Stair Case was used in determining the Apparent Cause

Work activities were started on WO 00164495 task 7 to excavate Unit 2 CST buried piping without Operations review.	
Why?	
Planner changed status thus bypassing operations	Work schedule not screened by OPS
Why?	
Planner believed it was allowed and there was perceived time pressure to start work	WO 00164495 task 7 not merged into 12 week schedule
Why?	
Management did not provide clear guidance and expectations for contract planner regarding IAS work flow.	Maintenance Support non-intrusive WOs were generally performed outside of the 12 week schedule.

IPEC00202999

AC-1

Management expectations for planning work flow were not clearly communicated to Planner and Supervisors.

CC-1

Maintenance Support non-intrusive WOs were generally performed outside of the 12 week schedule.

<u>EXTENT OF CONDITION:</u> *(see Procedure step 5.4[2](e))*

In Maintenance Support this was the only Planner to route work flow. Corrective actions taken preclude further reoccurrences of this type.
All Maintenance Support work activities within the Protected area are now included in the 12 week schedule or merged when fast tracked.
There is an extent of condition associated with this Condition Report. CR-IP3-2008-02817 identifies 33 3R15 work orders that went to Ready without the Operation Assessment being performed. This was classified as a "D" Track &Trend and does not seem to be the result of Planners deliberately bypassing Operations in the workflow.

IPEC00203000

ACTIONS COMPLETED

(See EN-LI-119 step 5.4[2](f))

APPARENT OR CONTRIBUTING CAUSE, OR EXTENT OF CONDITION ISSUE	ACTION COMPLETED [note any Work Orders/Requests, ER'S, other]
Unsupported piping CR- IP2-2008-04961	Span reviewed by design engineering and found acceptable
PS- Work activities were started on WO 00164495 task 7 to excavate Unit 2 CST buried piping without Operations review.	Work Order tasks RETURNED to Operations for review and after review work commenced
	Planner coached on requirement for ensuring Operations review / assessment of work activities.
	All maintenance Support work activities within the protected area are now placed in the 12 week schedule.

PROPOSED CORRECTIVE ACTIONS

(See EN-LI-119 step 5.4[2](f))

APPARENT OR CONTRIBUTING CAUSE, OR EXTENT OF CONDITION ISSUE	CORRECTIVE ACTION DESCRIPTION [note any Work Orders/Requests, ER's, other]	Assigned Department	Due Date
AC-1 **Management expectations for planning work flow were not clearly communicated.**	Ensure all Planners and Supervisors reporting to Maintenance Support understand the requirement for Operation's review and assessment of work task activities	Maintenance Support	12/18/08
CC-1 **Maintenance Support non-intrusive WOs were generally performed outside of the 12 week schedule.**	Verify Maintenance Support work tasks in the protected area are included or merged into the12 week schedule.	Maintenance Support	12/18/08

TREND DATA:

Cause Codes:

Human Performance Causal Factor(s) (List all)	Equipment Causal Factors (List all):	O&P Causal Factor(s) (List all):
WP4A, WP3E,	NA	OP5U

EFE Codes (see Procedure step 5.5 [5]):

INPO PO&C codes:	Failure Mode Codes:
NA	NA

ACE Evaluator (print Name):R. Trombetta 11/18/08

IPEC00203002

Entergy	CONDITION REPORT	CR-IP2-2008-04706

Originator:	Schoen,Peter S	**Originator Phone:**	5299
Originator Site Group:	IP2 Operations Watch Staff IP2	**Operability Required:**	N
Supervisor Name:	Dean,Gregory D	**Reportability Required:**	N
Discovered Date:	10/21/2008 13:05	**Initiated Date:**	10/21/2008 13:22

Condition Description:

Work order 00164495 for CST underground piping inpection was taken to a ready status without going through Operations review process. Work was implemented without being on the station schedule.

Immediate Action Description:

none

Suggested Action Description:

ensure proper work reviews are performed.
schedule all work to be performed on site

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
CST	HCLM/SR/MR	ACCUMU	AFW

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP2-2008-04691
WON	00164495

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
AJ	MAPS
REPORT WEIGHT	1
INPO BINNING	ER4
KEYWORDS	KW-WORK CONTROL
KEYWORDS	KW-PROCEDURE NON-COMPLIANCE
KEYWORDS	KW-SCHEDULING & COORDINATION
KEYWORDS	KW-WORK PACKAGE PLANNING
HEP FACTOR	H

IPEC00203003

Entergy	ADMIN	CR-IP2-2008-04706

Initiated Date: 10/21/2008 13:22 **Owner Site and Group:** IP2 MAINT-Support Mgmt IP2

Current Contact:

Current Significance: D

Closed by: Harrison,Christine B 10/27/2008 9:41

Summary Description:

Work order 00164495 for CST underground piping inpection was taken to a ready status without going through Operations review process. Work was implemented without being on the station schedule.

Remarks Description:

Closure Description:

10/27/08: Per CRG, the evaluation of this CR will be included in the apparent cause evaluation assigned to Maintenance Support under CR-IP2-2008-04691.

IPEC00203004

IPEC00203004

Entergy	ASSIGNMENTS	CR-IP2-2008-04706

Version: 1

Significance Code: D

Classification Code: CLOSE TO CR

Owner Site and Group: IP2 MAINT-Support Mgmt IP2

Performed By: Harrison,Christine B 10/27/2008 10:17

Assignment Description:

10/27/08: Per CRG, the evaluation of this CR will be included in the apparent cause evaluation assigned to Maintenance Support under CR-IP2-2008-04691.

IPEC00203005

IPEC00203005

Entergy	CONDITION REPORT	CR-IP2-2008-04754

Originator: Azevedo,Nelson F
Originator Phone: 7346775
Originator Site Group: IP2 P&C Eng Codes Mgmt IP2
Operability Required: Y
Supervisor Name: Burroni,Richard J
Reportability Required: Y
Discovered Date: 10/23/2008 06:04
Initiated Date: 10/23/2008 06:13

Condition Description:

Visual inspections of the underground piping exposed by the upper excavation between the CST and the Aux Feed Pump building revealed five areas where the coating had degraded. Subsequent UT inspections indicated that the piping remains at full thickness and therefore there has been no corrosion (other than minor surface corrosion) of the piping as a result of coating degradation in these five areas.

Immediate Action Description:

Discussed the results with the appropriate stakeholders.

Suggested Action Description:

Complete excavation of the lower hole, perform visual/UT inspection of the piping in the lower hole and repair any araes where the coating has degraded.

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
		PIPE	COND

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
REPORT WEIGHT	1
HEP FACTOR	E
EM	ESPC
INPO BINNING	ER3
KEYWORDS	KW-AGE MANAGEMENT
KEYWORDS	KW-NDE
KEYWORDS	KW-PIPE WALL
KEYWORDS	KW-MARGIN REVIEW
KEYWORDS	KW-CODES & STANDARDS
# PERIODIC REVIEW - INITIAL	05/27/09 NA as CR closed this date

IPEC00203006

IPEC00203006

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04754

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	CRG/CARB/OSRC IP2	Harrison,Christine B
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By:	Harrison,Christine B	10/29/2008 07:22:41
Performed By:	Azevedo,Nelson F	11/18/2008 09:36:34
Subperformed By:		
Approved By:		
Closed By:	Azevedo,Nelson F	11/18/2008 09:36:34

Current Due Date: 11/19/2008 **Initial Due Date:** 11/19/2008

CA Type: DISP - CA

Plant Constraint: #NONE

CA Description:

Please review and assign further corrective actions as required.

Response:

The three CST pipes (aux feed pump supply, CST return and CST overflow) were exposed at two locations for approximately 10' each. An inspection in the upper hole identified five areas which required coating repair and one area in the lower hole which required coating repair. In addition, there were several areas in the overflow pipe in the lower hole which required coating repair. These repairs have been completed and the upper hole has been backfilled. The lower hole is ready for backfilling. UT thickness measurements were also performed on those areas where the base metal was exposed and these inspections confirmed that the pipe thickness remains at nominal thickness (i.e. within the manufacturers tolerance). All of these activities have been performed under WO 164495. CA 0002 has been issued to evaluate any future inspections and its associated technical basis.

Subresponse :

Closure Comments:

IPEC00203007

IPEC00203007

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04754

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Staff IP2	Lee,Robert C
Subassigned To :			

Originated By:	Azevedo,Nelson F	11/14/2008 14:39:29
Performed By:	Azevedo,Nelson F	12/11/2008 12:11:15
Subperformed By:		
Approved By:		
Closed By:	Azevedo,Nelson F	12/11/2008 12:11:15

Current Due Date: 12/12/2008 **Initial Due Date:** 12/12/2008

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Determine if additional future inspections are required for these pipes. Provide the technical basis for the decision.

Response:

Description:
Determine if additional future inspections are required for these pipes. Provide the technical basis for the decision.

Response:
Completed assessments of these lines determined these lines to be of HIGH impact (2 lines are safety related), MEDIUM corrosion risk and HIGH inspection priority. The HIGH inspection priority results from the safety function performed by Lines 1505 and 1509. The pipe material, soil resistivity and site conditions factors result in these lines being of medium corrosion risk.

The 3 inspected lines were:

12" Line 1505 - AFP suction line
8" Line 1509 - Condensate supply to the CST
10" Overflow line (no line number assigned, corrugated metal pipe) to manhole #5

These pipes run underground in parallel with one another. As stated above, in accordance with the methodology provided by EN-DC-343, for determining the inspection priority and re-inspection interval, Lines 1505 and 1509 are of High Priority. Accordingly, with the initial inspection of these lines performed in October/November 2008, re-inspection of of these lines is required within 8 years, or by September 2016.

The visual inspection of these pipes at the lower excavation revealed that they were in generally good condition, with the coating intact and in acceptable condition. See the attached as-found inspection results by the coatings engineer, and post coating repair inspection reports. A minor coating repair was required at one location on 8" Line 1509, and the 10" overflow line required repair at the top portion of the pipe at the crests of the corrugations, possibly indicative of coating damage during the digging. Based on the results of these pipe visual inspections (at the upper and lower holes), and the coating repairs performed, there was no evidence of any significant pipe degradation that would warrant the re-inspection of these pipes at the same locations. Future inspection of these lines will be performed at different location(s) along their length. The scheduling of the future inspections will be controlled under the IPEC Buried Pipe Program. CA #3 has been created to track the scheduling of the future inspection of these lines, pending formal issue of the IPEC Buried Pipe Program document.

Subresponse :

IPEC00203008

Closure Comments:

Attachments:

Resp Description

CST Lower Excavation - As-Found Inspection

IPEC00203009

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04754

CA Number: 3

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Staff IP2	Lee,Robert C
Subassigned To :			

Originated By:	Azevedo,Nelson F	12/11/2008 12:10:46
Performed By:	Lee,Robert C	2/19/2009 22:54:55
Subperformed By:		
Approved By:		
Closed By:	Lee,Robert C	2/19/2009 22:54:55

Current Due Date: 02/24/2009 **Initial Due Date:** 02/24/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Track the scheduling of the future inspection of these lines, pending formal issue of the IPEC Buried Pipe Program document.

Response:

In lieu of each of the Entergy sites issuing its own buried piping program document, it has been decided by the Buried Piping Peer Group that a fleet Central Engineering Program (CEP) Buried Piping Program Document will be generated. (Target date for issue is 4th QTR 2009). To manage and track all inspection activities, each site will use Iddeal Scheduleworks (or equivalent) software.

The details and results of the impact, corrosion risk assessments, inspection prioritization and schedules will be captured and maintained by Iddeal Scheduleworks.

For the buried condensate piping from the IP2 CST to the AFW Bldg that is the concern of this CA, as previously stated, these lines are categorized as being high priority for inspection. As such, the re-inspection will be performed 8 years from the intial inspection, or by end of 2016.

Capture of the IPEC buried pipe program activities, key program data and performance indicators into Iddeal is being tracked by LO-HQNLO-2008-00015 CA 65.
Attached to this reponse is an EXCEL spreadsheet identifying the IP2 buried piping inspection schedule. The subject piping and their future inspection dates have been highlighted.

This CA may be closed to the aforementioned HQNLO CA.

Subresponse :

Closure Comments:

Attachments:

Resp Description

IP2 Buried Piping Inspection Schedule

IPEC00203010

Entergy	CA DUE DATE EXTENSION	CR-IP2-2008-04754

Corrective Action : **CR-IP2-2008-04754 CA-00003**

Version: 1 **Approved:** ✓

Requested Duedate: 02/24/2009 **Previous Duedate:** 02/15/2009

Requested By: Lee,Robert C 02/06/2009

Approved By: Troy,Michael J 02/12/2009

Request Description:

An extension is required due to assignee's attending an EPRI Buried Piping Issues Group meeting during the week of 2/9-2/12.
This extension is acceptable as no operability issues are involved; the CA involves tracking of piping re-inspections to be performed in the long term (8-10 years out).
This extension has been discussed with and approved by my supervisor.

Approved Description:

IPEC00203011

IPEC00203011

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04754

CA Number: 4

	Site	Group	Name
Assigned By:	IP2	CAA Staff IP2	Reynolds,Joseph A
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By:	Jowitt,Roseann	2/20/2009 06:35:34
Performed By:	Azevedo,Nelson F	2/27/2009 06:56:02
Subperformed By:		
Approved By:		
Closed By:	Reynolds,Joseph A	2/27/2009 07:45:26

Current Due Date: 03/04/2009 **Initial Due Date:** 03/04/2009

CA Type: CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

CAT-C, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE READY TO CLOSE. REVIEW CR AND APPROVE / DISAPPROVE CLOSURE IN ACCORDANCE WITH EN-LI-102, SECTION 5.9.

Response:

This CR is not ready for closure. CA 005 has been issued for follow up evaluations.

Subresponse :

Closure Comments:

Per CAA review, noted the CR owner did NOT approve the closure of the CR, and assigned additional action. Therefore this CR removed from the closure process and this completed action closed.

IPEC00203012

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04754

CA Number: 5

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Staff IP2	Lee,Robert C
Subassigned To :			

Originated By:	Azevedo,Nelson F	2/27/2009 06:55:05
Performed By:	Azevedo,Nelson F	5/27/2009 09:17:22
Subperformed By:		
Approved By:		
Closed By:	Azevedo,Nelson F	5/27/2009 09:17:22

Current Due Date: 05/31/2009 **Initial Due Date:** 05/31/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Given the results of the leak in the AFP building, determine if the scope and/or frequency of future buried condensate lines should be modified. This should cover both IP2 and IP3.

Response:

The initial Impact and Corrsoion Risks assessments for the AFW underground piping were performed iaw fleet procedure EN-DC-343 "Buried Piping & Tank Inspection and Monitoring Program." Those assessment resulted in the categorization of Lines 1505 and 1509 as high inspection priority lines, with first inspection performed within 5 years (by EOY 2012), and subsequent re-inspection within 8 years thereafter (EOY 2020).

Responding to the ISE Panel recommendation to adopt a more agressive inspection schedule, and specifically to complete excavation and inspections by EOY 2008, the IP2 AFW lines 1505, 1509 and overflow line were excavated and inspected at 2 locations in Nov 2008. While there was some pipe coating degradation observed, there was no evidence of external corrosion. UT determination of the pipe wall thickness at the areas of degraded coating degradation showed that the pipe wall was at least greater than 87.5% of the nominal pipe wall. These findings were consistent with the assessments which established the inspection priority for these lines.

The Failure analysis of the section of removed pipe from Line 1509 containing the through wall failure, and extent of condition review are documented under CR-IP2-2009-00666 CA # 4.
As part of extent of condition, additional guided wave inspection of Lines 1505 and 1509 will be performed by September 2009, as follows:

IP2 8" (Line 1509) Condensate Return Line in the excavated area in the FRV Room. (CR-IP2-2009-00666 CA #21)
IP2 12" (Line 1505) Condensate Supply Line in the excavated area in the FRV Room. (CR-IP2-2009-00666 CA #22)

IP3 12" Condensate Supply Line outside the Auxiliary Feedwater Pump Building where it goes underground. (CR-IP2-2009-00666 CA #24)
IP3 8" Condensate Return Line outside the Auxiliary Feedwater Pump Building where it exits the ground. (CR-IP2-2009-00666 CA #25)

The results of the above additional inspections will be evaluated by PCE and used to adjust the (EN-DC-343 specified) 8 year interval for subsequent inspections, as appropriate.

Subresponse :

IPEC00203013

IPEC00203013

Closure Comments:

IPEC00203014

Entergy	CA DUE DATE EXTENSION	CR-IP2-2008-04754

Corrective Action : **CR-IP2-2008-04754 CA-00005**

Version:	1	**Approved:**	✓
Requested Duedate:	05/31/2009	**Previous Duedate:**	04/15/2009
Requested By:	Azevedo,Nelson F	04/14/2009	
Approved By:	Azevedo,Nelson F	04/14/2009	

Request Description:

This CA needs to be extended because the root cause analysis analysis for the AFW leak has not yet been completed and this evaluation will be the bases for any inspection program going foward. There is no adverse impact on industrial or nuclear safety becasue all known issues and leaks have been repaired. Supervisory concurrence has been obatined for this extension.

Approved Description:

Approved.

IPEC00203015

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04754

CA Number: 6

	Site	Group	Name
Assigned By:	IP2	CAA Mgmt IP2	Donnelly,John M
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By:	Reynolds,Joseph A	5/14/2009 10:55:07
Performed By:	Azevedo,Nelson F	5/27/2009 09:19:17
Subperformed By:		
Approved By:		
Closed By:	Reynolds,Joseph A	5/27/2009 09:33:54

Current Due Date: 06/04/2009 **Initial Due Date:** 06/04/2009

CA Type: CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

Periodic Review CA
Please note, this CAT C CR has been open approximately greater than 6 months and therefore requires a periodic review per attachment 9.8 of EN-LI-102. Ensure attachment 9.8 (attached) is completed. Review and complete the Long Term 9.9 form if appropriate. Both forms are required if the CR is classified as a Long Term CR.

In accordance with EN-LI-102, Corrective Action Process, section 5.8 [5] (a) and/or (b) a periodic review of the CR is needed to assure the timeliness challenges for the issue resolution are understood, the impact to plant operations under the present plant conditions as well as the continued risk imposed by the action remaining open are acceptable, the repair priority is appropriate and the administrative CA processing expectations have been performed as expected thus far for the CR (i.e. CARB approvals, Extensions approved by correct level of management, etc).

As the CR owner, please review the Condition Report IAW EN-LI-102 section 5.8 [5] (a) (1) through (7) and document the resolution to the procedure discussion points. Attachment 9.8 to LI-102 (a form) is available from the CA&A webpage to assist in the review.

IF your review determines the CR should also be reclassified as a Long Term CR, ensure the information requested in attachment 9.9 to LI-102 (another form available via the CA&A webpage) is captured in the CA response. Reclassifying the CR as long term (if appropriate) lengthens the periodic review to annually.

For all cases, LI-102 requires the Director or GMPO level position (or higher) that approved/acknowledged the acceptability of the periodic review conclusions to be documented.

Document the results of the periodic review in the response to this new CA. If used, attach the completed CR periodic review form (LI-102 - attachment 9.8) to the response section of this CA.

Remember the Long Term classification only applies if the restriction to completing the task involves one of the following four plant/process restrictions. (1) A Modification or Design Change must be completed to resolve the action, (2) More than one training cycle is required to complete the action, (3) Outside Regulator Agency (NRC, etc) approval is required to complete the action, (4) a Forced Outage or Refueling Outage or FEG week of sufficient duration is required to establish plant conditions to complete the action.

Response:

All CAs from this CR are now closed and no additional corrective actions are required at this time. Therefore, this evaluation is no longer required since this CR is now ready for closure.

Subresponse :

Closure Comments:

Per CAA review, noted the CR owner recommended and approved the closure of the CR (this was verified via verbal communication with respondent by the CAA reviewer). Therefore this interim review action is no longer needed and was closed. CAA changed the CA type to closure review and updated the trend codes to reflect the status of the review. Then this completed action closed.

Attachments:

Ca Description

Periodic review form

IPEC00203017

Initiated Date: 10/23/2008 6:13 **Owner Site and Group:** IP2 P&C Eng Codes Mgmt IP2

Current Contact: Joe Reynolds

Current Significance: C

Closed by: Reynolds,Joseph A 5/27/2009 9:35

Summary Description:

Visual inspections of the underground piping exposed by the upper excavation between the CST and the Aux Feed Pump building revealed five areas where the coating had degraded. Subsequent UT inspections indicated that the piping remains at full thickness and therefore there has been no corrosion (other than minor surface corrosion) of the piping as a result of coating degradation in these five areas.

Remarks Description:

Closure Description:

Per CAA review, acknowledge the CR owner (PC Eng Codes) recommendation and approval to close the CR. The CR issue "Visual inspections of the underground piping exposed by the upper excavation between the CST and the Aux Feed Pump building revealed five areas where the coating had degraded. Subsequent UT inspections indicated that the piping remains at full thickness and therefore there has been no corrosion (other than minor surface corrosion) of the piping as a result of coating degradation in these five areas." resolution was captured, therefore CAA noted the trend codes applied and then closed the CR.

IPEC00203018

Entergy	OPERABILITY	CR-IP2-2008-04754

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Buchal,Timothy J 10/23/2008 07:58

Approved By: Brooks,Kevin L 10/23/2008 08:55

Operability Description:

Since UT inspections are satisfactory no challenge to the Aux Feed system exists, no operability concern exists.

Approval Comments:

agree and approve

IPEC00203019

IPEC00203019

Version: 1

Significance Code: C

Classification Code: CORRECT/ADDRESS

Owner Site and Group: IP2 P&C Eng Codes Mgmt IP2

Performed By: Harrison,Christine B 10/28/2008 14:07

Assignment Description:

IPEC00203020

Reportability Version: 1

Report Number:

Report Code: NOT REPORTABLE

Boilerplate Code:

Performed By : Rokes,Charles B 10/27/2008 08:22

Reportability Description:

Recorded condition does not meet reporting criteria of SMM-LI-108 based on operations conclusion that the UT inspections were satisfactory therefore there is no challenge to the Aux Feed system and no operability concern exists.

IPEC00203021

Lee, Robert C

From: Guarnaccia, Stephen
Sent: Wednesday, November 12, 2008 4:34 PM
To: Lee, Robert C
Cc: Arcate, John; Drake, Richard S; Pineda, Juan J
Subject: Unit 2 CST Piping Inspection

LOWER EXCAVATION

Bob,

I inspected the three CST pipes located in the excavation on the hill north of the Unit 2 VC.

The large diameter pipe's coating, although rather inconsistent in spots, is acceptable. The coating was found to have some reddish material attached to the lower left side that appeared to be corrosion byproducts. I removed a few small samples of the material and checked them with a magnet. They were not ferrous in nature therefore not corrosion products.

The smaller diameter pipe's coating was more uniform in its appearance and in generally good condition. There is one location on the upper top end that has a well defined crack in the coating running circumferentially from the 11 o'clock to the 1 o'clock position. The crack is approximately four or five inches in length with a small amount of corrosion products emanating from it. This area must be repaired in accordance with the same requirements as the previous repairs. In my opinion, judging from the small amount of corrosion products and the good appearance of the coating the pipe does not need to be exposed for a more detailed inspection in order to determine the amount of material lost.

The corrugated pipe has a number of areas where the coating has been removed and they need to be repaired as previously instructed also.

I recommend that you take a look at the pipes yourself to verify my findings in order to resolve the issue.

I could not find your camera cable so I could not attach a picture at this time. Let's get together tomorrow morning after the tailgate and view the pictures.

Steve G. x6609

12" LINE 1505 - AFP SUCTION
8" LINE 1509 - CONDENSATE SUPPLY TO CST
10" OVERFLOW - TO MANHOLE #
(CORRUGATED METAL PIPE)

IPEC00203022

Buried Piping Program Initial Inspection Schedule Template

Plant: IP2
Date: 11/20/2008

# insp sched	year
3	2008
2	2009
6	2010
5	2011
6	2012
3	2013
0	2014
0	2015
3	2016
2	2017
6	2018
5	2019
3	2020
3	2021
3	2022
50	total

HIGH IMPACT PIPING

Insp priority	# of lines	Initial Inspt	end date
HIGH	22	5Y	12/31/2013
MEDIUM	3	8Y	12/30/2016
LOW	0	10Y	12/30/2018
Total	**25**		

Notes:
1) IP2 spreadsheet for development of high level initial schedule, for HIGH IMPACT piping only.
2) Initial Inspections: High Priority (RED) - by 2013; Medium (YELLOW) - by 2018
3) Subsequent inspection schedule is subject to revision, pending results of initial inspections. High Priority (RED) - within 8 years of initial inspection; Medium Priority (YELLOW) - within 10 years of intial inspection.

Section #	Activity Name	Start (initial)	Finish (initial)	Impact Assessment	Corrosion Risk	Inspection Priority	Initial Inspection (years)	Inspection Interval (years)	Description	System	Initial Inspection (by 2013)	Subsequent Inspection (by 2021)
BP-2CWM-1	Pipe inspection	1/1/2010	12/31/2010	HIGH	MEDIUM	HIGH	5	8	CW Supply Header - 16"	City Water	2010	2018
BP-2CWM-2	Pipe inspection	1/1/2010	12/31/2010	HIGH	MEDIUM	HIGH	5	8	CW to AFP Bldg - 8" Line 1502	City Water	2010	2018
BP-2EDGFO-1	Pipe inspection	1/1/2010	12/31/2010	HIGH	MEDIUM	HIGH	5	8	EDG FOST - 3" equalizing line	Fuel Oil	2010	2018
BP-2EDGFO-2	Pipe inspection	1/1/2010	12/31/2010	HIGH	MEDIUM	HIGH	5	8	EDG FOST - 4" tank fill	Fuel Oil	2010	2018
BP-2SW-1	Pipe inspection	1/1/2011	12/31/2011	HIGH	MEDIUM	HIGH	5	8	Main SW Header - 24" Line 408	Service Water	2011	2019
BP-2SW-2	Pipe inspection	1/1/2011	12/31/2011	HIGH	MEDIUM	HIGH	5	8	Main SW Header - 24" Line 409	Service Water	2011	2019
BP-2SW-3	Pipe inspection	1/1/2012	12/31/2012	HIGH	MEDIUM	HIGH	5	8	SW Branch to IACC HXs- 3" Line 1704	Service Water	2012	2020
BP-2SW-4	Pipe inspection	1/1/2012	12/31/2012	HIGH	MEDIUM	HIGH	5	8	SW Branch to IACC HXs- 3" Line 1705	Service Water	2012	2020
BP-2SW-5	Pipe inspection	1/1/2011	12/31/2011	HIGH	MEDIUM	HIGH	5	8	Return to Discharge Canal - 24" Line 405	Service Water	2011	2019
BP-2AFW-1	Pipe inspection	10/2008 A	11/2008 A	HIGH	MEDIUM	HIGH	5	8	CST to AFWP Suction, 12" Line 1505	Aux Feedwater	4th Qtr 2008 - COMPLETE	2016
BP-2AFW-2	Pipe inspection	10/2008 A	11/2008 A	HIGH	MEDIUM	HIGH	5	8	CST Inlet - 8" Line 1509	Aux Feedwater	4th Qtr 2008 - COMPLETE	2016
BP-2AFW-3	Pipe inspection	1/1/2013	12/31/2013	HIGH	MEDIUM	HIGH	5	8	CST Overflow - 8" (C.M.P.)	Aux Feedwater	2013	2021
BP-2AFW-4	Pipe inspection	10/2008 A	11/2008 A	HIGH	MEDIUM	HIGH	5	8	CST Overflow - 10" (C.M.P.)	Aux Feedwater	4th Qtr 2008 - COMPLETE	2016
BP-2CW-1	Pipe inspection	1/1/2009	12/31/2009	HIGH	MEDIUM	HIGH	5	8	CWP disch to Condenser - 84"	Circulating Water	2009	2017
BP-2CW-2	Pipe inspection	1/1/2009	12/31/2009	HIGH	MEDIUM	HIGH	5	8	CWP disch to Condenser - 84"	Circulating Water	2009	2017

IPEC00203023

IPEC00203024

Section #	Activity Name	Start (initial)	Finish (initial)	Impact Assessment	Corrosion Risk	Inspection Priority	Initial Inspection (years)	Inspection Interval (years)	Description	System	Initial Inspection (by 2013)	Subsequent Inspection (by 2021)
BP-2CW-3	Pipe inspection	1/1/2010	12/31/2010	HIGH	MEDIUM	HIGH	5	8	CWP disch to Condenser - 84"	Circulating Water	2010	2018
BP-2CW-4	Pipe inspection	1/1/2010	12/31/2010	HIGH	MEDIUM	HIGH	5	8	CWP disch to Condenser - 84"	Circulating Water	2010	2018
BP-2CW-5	Pipe inspection	1/1/2011	12/31/2011	HIGH	MEDIUM	HIGH	5	8	CWP disch to Condenser - 84"	Circulating Water	2011	2019
BP-2CW-6	Pipe inspection	1/1/2011	12/31/2011	HIGH	MEDIUM	HIGH	5	8	CWP disch to Condenser - 84"	Circulating Water	2011	2019
BP-2IA-1	Pipe inspection	1/1/2012	12/31/2012	HIGH	LOW	MEDIUM	8	10	IA Line to Intake Struct - 1½"	Instrument Air	2012	2022
BP-2IA-2	Pipe inspection	1/1/2012	12/31/2012	HIGH	LOW	MEDIUM	8	10	IA Supply to AFP Bldg - 2"	Instrument Air	2012	2022
BP-2IA-3	Pipe inspection	1/1/2012	12/31/2012	HIGH	LOW	MEDIUM	8	10	IA Supply to VC - 2"	Instrument Air	2012	2022
BP-2CPP-1	Pipe inspection	1/1/2011	12/31/2011	HIGH	MEDIUM	HIGH	5	8	1-1/2" piping to penet. - 1½"	Cont. Penet. Press.	2013	2021
BP-2WD-1	Pipe inspection	1/1/2012	12/31/2012	HIGH	MEDIUM	HIGH	5	8	RWST Overflow to WHT Pit, 6" Line 299	Waste Disposal	2012	2020
BP-2WD-2	Pipe inspection	1/1/2013	12/31/2013	HIGH	MEDIUM	HIGH	5	8	PWST Overflow to Line 299 - 3"	Waste Disposal	2013	2021

IPEC00203024

Entergy	CONDITION REPORT	CR-IP2-2008-04878

Originator: Drake,Richard S
Originator Phone: 6607
Originator Site Group: IP2 Design Eng Civil/Str Staff IP2
Operability Required: Y
Supervisor Name: McCaffrey,Thomas S
Reportability Required: Y
Discovered Date: 10/30/2008 12:34
Initiated Date: 10/30/2008 12:41

Condition Description:

During the inspection of the Unit 2 newly applied Bitumastic coating on the corrogated drain line for the Unit 2 CST buried piping excavation the coating was found to be peeled off on the temporary insulation that was applied and the coating not properly adhering to the pipe. The tapecoat 20 coating applied to the other two pipes was acceptable. The cause appears to be improper surface preparation for the coating. Actions are being taken under WO 00164495 to remove coating, prep pipe, and apply the tapecoat 20 on the corragated pipe. Close to Track and trend(actions taken)

Immediate Action Description:

notified Construction Supervisors of issue and instructed to remove the coating and gave alternate coating to apply and proper surface preparation required.

Suggested Action Description:

coating will be removed under the WO 00164495 and the tapecoat 20 coating applied

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
CST	HCLM/SR/MR	ACCUMU	AFW

REFERENCE ITEMS:

Type Code	Item Desc
WON	00164495

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
REPORT WEIGHT	1
WI	MAMG
INPO BINNING	MA1
HEP FACTOR	H
KEYWORDS	KW-REWORK
KEYWORDS	KW-AGE MANAGEMENT
KEYWORDS	KW-PIPE LINING

IPEC00203025

IPEC00203025

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04878

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	CRG/CARB/OSRC IP2	Harrison,Christine B
Assigned To:	IP2	MAINT-Support Mgmt IP2	Manley,Mark P
Subassigned To :			

Originated By:	Harrison,Christine B	11/3/2008 09:44:32
Performed By:	Trombetta,Robert G	11/24/2008 09:47:31
Subperformed By:		
Approved By:		
Closed By:	Trombetta,Robert G	11/24/2008 09:47:31

Current Due Date: 11/26/2008 **Initial Due Date:** 11/26/2008

CA Type: DISP - CA

Plant Constraint: #NONE

CA Description:

Please review this rework issue and assign further corrective actions as required.

Response:

The section of failed coating was an area that was beyond the original scope of repair and surface prep. This material was removed and the surface properly preped and recoated under WO 00164495, which is in finish status. Action complete

Subresponse :

Closure Comments:

IPEC00203026

IPEC00203026

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04878

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Staff IP2	Lee,Robert C
Assigned To:	IP2	P&C Eng Codes Staff IP2	Lee,Robert C
Subassigned To :	HQN	Bus Develop New Plant Mgmt HQN	Ivy,Ted S

Originated By:	Lee,Robert C	11/5/2008 12:48:45
Performed By:	Lee,Robert C	1/29/2009 06:11:31
Subperformed By:	Ivy,Ted S	1/27/2009 15:17:55
Approved By:		
Closed By:	Lee,Robert C	1/29/2009 06:11:31

Current Due Date: 01/31/2009 **Initial Due Date:** 01/31/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

review the Buried Piping and Tanks Inspection Program proposed for license renewal for possible changes.

Response:

See sub-response below.

Subresponse :

See attached response for recommended changes to the Buried Piping and Tanks Inspection program. CA-03 assigned to make necessary revisions to IP-RPT-06-LRD-07 and evaluate the need for a change to appendix B of the LRA and commitment 3 for implementing the buried piping and tanks inspection program

Closure Comments:

Attachments:

Subresp Description

Review of Buried Piping and Inspection Program

IPEC00203027

IPEC00203027

Entergy	CA DUE DATE EXTENSION	CR-IP2-2008-04878

Corrective Action : **CR-IP2-2008-04878 CA-00002**

Version:	1	**Approved:**	☑
Requested Duedate:	12/19/2008	**Previous Duedate:**	12/12/2008
Requested By:	Lee,Robert C	12/04/2008	
Approved By:	Lee,Robert C	12/04/2008	

Request Description:

An extension is required due to the Buried Pipe Program owner's scheduled week long offsite IST training during the week of Dec. 8-12, 2008. This extension is acceptable because there are no operability issues involved, and the extended due date will still support the License Renewal Project.

This has been discussed and approved by my supervisor.

Approved Description:

Due date extension is acceptable.

IPEC00203028

IPEC00203028

Entergy	CA DUE DATE EXTENSION	CR-IP2-2008-04878

Corrective Action : **CR-IP2-2008-04878 CA-00002**

Version:	2	**Approved:**	✓
Requested Duedate:	01/31/2009	**Previous Duedate:**	12/19/2008
Requested By:	Manzione,Stephen J	12/12/2008	
Approved By:	Manzione,Stephen J	12/12/2008	

Request Description:
More time is required to assess generic implication

Approved Description:
Approved

IPEC00203029

IPEC00203029

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04878

CA Number: 3

	Site	Group	Name
Assigned By:	HQN	Bus Develop New Plant Mgmt HQN	Ivy,Ted S
Assigned To:	HQN	Bus Develop New Plant Mgmt HQN	Ivy,Ted S
Subassigned To :			

Originated By:	Ivy,Ted S	1/27/2009 15:14:11
Performed By:	Ivy,Ted S	4/8/2009 07:19:25
Subperformed By:		
Approved By:		
Closed By:	Ivy,Ted S	4/8/2009 07:19:25

Current Due Date: 04/10/2009 **Initial Due Date:** 04/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Make necessary revisions to IP-RPT-06-LRD-07 to incorporate changes from CA-02 and evaluate the need for a change to appendix B of the LRA and commitment 3 for implementing the buried piping and tanks inspection program.

Response:

Revision 5 of IP-RPT-06-LRD07 was approved by License Renewal Services on 3/18/07 to include changes to the buried piping and tanks program as described in the response to CA-02. A change to Appendix B of the license renewal application or license renewal commitment 3 is not necessary since the license renewal documents already include the requirement to consider and incorporate industry and site operating experience.

Subresponse :

Closure Comments:

IPEC00203030

IPEC00203030

Entergy	CORRECTIVE ACTION	CR-IP2-2008-04878

CA Number: 4

	Site	Group	Name
Assigned By:	IP2	CAA Staff IP2	Reynolds,Joseph A
Assigned To:	IP2	Maint Support Mgmt IP2	Manley,Mark P
Subassigned To :			

Originated By:	Jowitt,Roseann	4/8/2009 07:56:48
Performed By:	Trombetta,Robert G	4/10/2009 12:41:08
Subperformed By:		
Approved By:		
Closed By:	Reynolds,Joseph A	4/10/2009 13:54:12

Current Due Date: 04/22/2009 **Initial Due Date:** 04/22/2009

CA Type: CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

CAT-C, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE READY TO CLOSE. REVIEW CR AND APPROVE / DISAPPROVE CLOSURE IN ACCORDANCE WITH EN-LI-102, SECTION 5.9.

Response:

CAT-C, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE CLOSED. APPROVE CLOSURE IN ACCORDANCE WITH EN-LI-102, SECTION 5.9.

Subresponse :

Closure Comments:

Per CAA review, noted the CR owner recommended and approved the closure of the CR.

IPEC00203031

IPEC00203031

Entergy	ADMIN	CR-IP2-2008-04878

Initiated Date: 10/30/2008 12:41 **Owner Site and Group:** IP2 Maint Support Mgmt IP2

Current Contact: Joe Reynolds

Current Significance: C

Closed by: Reynolds,Joseph A 4/10/2009 13:56

Summary Description:

During the inspection of the Unit 2 newly applied Bitumastic coating on the corrogated drain line for the Unit 2 CST buried piping excavation the coating was found to be peeled off on the temporary insulation that was applied and the coating not properly adhering to the pipe. The tapecoat 20 coating applied to the other two pipes was acceptable. The cause appears to be improper surface preparation for the coating. Actions are being taken under WO 00164495 to remove coating, prep pipe, and apply the tapecoat 20 on the corragated pipe. Close to Track and trend(actions taken)

Remarks Description:

Closure Description:

Per CAA review, acknowledge the CR owner (Maint Support) recommendation and approval to close the CR. The CR issue "During the inspection of the Unit 2 newly applied Bitumastic coating on the corrogated drain line for the Unit 2 CST buried piping excavation the coating was found to be peeled off on the temporary insulation that was applied and the coating not properly adhering to the pipe. The tapecoat 20 coating applied to the other two pipes was acceptable. The cause appears to be improper surface preparation for the coating. Actions are being taken under WO 00164495 to remove coating, prep pipe, and apply the tapecoat 20 on the corragated pipe. Close to Track and trend (actions taken)" resolution was captured, therefore CAA noted the trend codes applied and then closed the CR.

IPEC00203032

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Santini,Philip R 10/30/2008 14:56

Approved By: Primrose,Eugene 10/30/2008 15:01

Operability Description:

The CR does not describe any degradation or failure to the subject CST piping. The CR describes a condition where a newly applied coating has not properly adhered to the pipe. This does not alter the pipes operability during this excavation period and the pipe will have its surface prepared again and the coating re-applied prior to completion of this work. Therefore no operability issue exists for the subject CST piping.

Approval Comments:

Agree and approved

IPEC00203033

Version: 1

Significance Code: C

Classification Code: CORRECT/ADDRESS

Owner Site and Group: IP2 Maint Support Mgmt IP2

Performed By: Harrison,Christine B 11/03/2008 10:17

Assignment Description:

IPEC00203034

IPEC00203034

Reportability Version: 1

Report Number:

Report Code: NOT REPORTABLE

Boilerplate Code:

Performed By : Rokes,Charles B 10/31/2008 07:01

Reportability Description:

Recorded condition does not meet reporting criteria of SMM-LI-108 based on operations determination that the CST piping is operable. The CR does not describe any degradation or failure to the subject CST piping. The CR describes a condition where a newly applied coating has not properly adhered to the pipe. This does not alter the pipes operability during this excavation period and the pipe will have its surface prepared again and the coating re-applied prior to completion of this work. Therefore no operability issue exists for the subject CST piping.

IPEC00203035

Response to CR-IP2-2008-04878 Action item 2

CR-IP2-2008-04754 identified a condition where the coating had degraded on five areas of a section of underground piping for the IP2 condensate storage tank. Further inspections determined the pipe external surface had only surface corrosion and remains at nominal pipe thickness at these locations.

CR-IP2-2008-04878 was written to document problems that occurred with the repair of the coating on the same buried piping for the Unit 2 CST. It stated:

> "During the inspection of the Unit 2 newly applied Bitumastic coating on the corrugated drain line for the Unit 2 CST buried piping excavation the coating was found to be peeled off on the temporary insulation that was applied and the coating not properly adhering to the pipe. The Tapecoat 20 coating applied to the other two pipes was acceptable. The cause appears to be improper surface preparation for the coating. Actions are being taken under WO 00164495 to remove coating, prep pipe, and apply the Tapecoat 20 on the corrugated pipe. Close to Track and trend."

Corrective action 2 of CR-IP2-2008-04878 requested the following action:
"Review the Buried Piping and Tanks Inspection Program proposed for license renewal for possible changes.'

The Buried Piping and Tanks Inspection Program proposed for license renewal was reviewed for potential enhancements based on the information provided in this CR. The program is described in IP-RPT-06-LRD07, "Aging Management Program Evaluation Results – Non Class 1 Mechanical". Under the detection of aging effects, the program specifies opportunistic inspections, at least one prior to the period of extended operation and at least one more during the first ten years of the period of extended operation. Although no measureable degradation of wall thickness was found on the buried CST piping, the observed coating degradation warrants revision of the program to specify periodic inspections in addition to opportunistic inspections.

A new corporate program EN-DC-343, "Buried Piping and Tanks Inspection and Monitoring Program" has been established to meet the groundwater protection initiative sponsored by NEI. This new procedure specifies periodic inspections of buried components with inspection frequency based on an evaluation that includes consideration of the impact of pipe failure and corrosion risk. Pipes are identified as having a high, medium or low impact assessment based on the safety class, public risk and economics. Corrosion risk is then determined through consideration of piping material, soil resistivity, drainage, use of cathodic protection and the type of coating. The inspection schedule as determined through the EN-DC-343 procedure will be applied to the Buried Piping and Tanks Inspection Program for license renewal. A revision of the license renewal report IP-RPT-06-LRD07, "Aging Management Program Evaluation Results – Non Class 1 Mechanical" will include these program changes. The proposed changes are shown in Attachment 1 as underlined blue font.

An additional action item will be assigned to make necessary revisions to IP-RPT-06-LRD-07 and evaluate the need for a change to appendix B of the LRA and commitment 3 for implementing the buried piping and tanks inspection program.

IPEC00203036

Attachment 1- Extract from IP-RPT-06-LRD07, "Aging Management Program Evaluation Results – Non Class 1 Mechanical" Showing Proposed Changes

3.1 Buried Piping and Tanks Inspection Program

Program Description

The Buried Piping and Tanks Inspection Program is compared to the program described in NUREG-1801, Section XI.M34, Buried Piping and Tanks Inspection.

This Buried Piping and Tanks Inspection Program is a new program that will include (a) preventive measures to mitigate corrosion and (b) inspections to manage the effects of corrosion on the pressure-retaining capability of buried carbon steel, gray cast iron, and stainless steel components. Preventive measures will be in accordance with standard industry practice for maintaining external coatings and wrappings. The evaluation of the buried components includes consideration of the impact of a pipe failure and corrosion risk. The component is identified as having a high, medium or low impact assessment based on the safety class, public risk and economics. Corrosion risk is then determined through consideration of piping material, soil resistivity, drainage, use of cathodic protection and the type of coating. The results of this analysis will establish the inspection priority and frequency for periodic inspections. In addition, buried components will be inspected when excavated during maintenance. If trending within the corrective action program identifies susceptible locations, the areas with a history of corrosion problems will be evaluated for the need for additional inspection, alternate coating, or replacement.

Prior to entering the period of extended operation, plant operating experience will be reviewed to verify that an inspection occurred within the past ten years. If an inspection did not occur, a focused inspection will be performed prior to the period of extended operation. A focused inspection will be performed within the first ten years of the period of extended operation, unless an opportunistic inspection occurs within this ten-year period.

This program will be implemented prior to the period of extended operation. This new program will be implemented consistent with the corresponding program described in NUREG-1801 Section XI.M34, Buried Piping and Tanks Inspection.

This program is credited in the following

- AMM01, Containment Spray Systems
- AMM03, Safety Injection Systems
- AMM04, City Water System
- AMM08, Plant Drains
- AMM12, Service Water Systems

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- AMM16, Fire Protection – Water Systems
- AMM18, Security Generators
- AMM21, Fuel Oil Systems
- AMM24, Auxiliary Feedwater Systems

Evaluation

Scope of Program

NUREG-1801, Scope of Program

"The program relies on preventive measures such as coating, wrapping and periodic inspection for loss of material caused by corrosion of the external surface of buried steel piping and tanks. Loss of material in these components, which may be exposed to aggressive soil environment, is caused by general, pitting, and crevice corrosion, and microbiologically-influenced corrosion (MIC). Periodic inspections are performed when the components are excavated for maintenance or for any other reason. The scope of the program covers buried components that are within the scope of license renewal for the plant."

Comparison to IPEC Scope of Program

The program relies on preventive measures such as coating, wrapping, and inspection for loss of material caused by corrosion of the external surface of buried carbon steel, gray cast iron, and stainless steel components. Inspections are performed when the components are excavated for maintenance or for any other reason. The IPEC program will manage loss of material on buried components subject to aging management review as indicated in the AMRRs listed above.

Aging effects for the following tanks are managed by the program.

- IP2 Fuel Oil Storage Tanks (21/22/23 FOST)
- GT1 Fuel Oil Storage North and South Storage Tanks
- IP2 Security Diesel Fuel Tank
- IP3 Appendix R Fuel Oil Storage Tank (ARDG-FO-ST)
- IP3 Security Propane Fuel Tanks (2 of them)
- IP3 Fuel Oil Storage tanks (EDG-31/32/33-FO-STNK)

Aging effects for buried piping, piping elements, and piping components in the auxiliary feedwater, city water, containment spray (IP3 only), fire protection, emergency diesel generator, safety injection (IP3 only), security propane generator (IP3 only), and service water systems are managed by the program.

IPEC scope of program will be consistent with NUREG-1801.

IPEC00203038

Response to CR-IP2-2008-04878 Action item 2

Preventive Actions

NUREG-1801, Preventive Actions

"In accordance with industry practice, underground piping and tanks are coated during installation with a protective coating system, such as coal tar enamel with a fiberglass wrap and a kraft paper outer wrap, a polyolifin tape coating, or a fusion bonded epoxy coating to protect the piping from contacting the aggressive soil environment."

Comparison to IPEC Preventive Actions

The preventive actions of the IPEC program will include protective coatings on underground components.

IPEC preventive actions will be consistent with NUREG-1801.

Parameters Monitored or Inspected

NUREG-1801, Parameters Monitored or Inspected

"The program monitors parameters such as coating and wrapping integrity that are directly related to corrosion damage of the external surface of buried steel piping and tanks. Coatings and wrappings are inspected by visual techniques. Any evidence of damaged wrapping or coating defects, such as coating perforation, holidays, or other damage, is an indicator of possible corrosion damage to the external surface of piping and tanks."

Comparison to IPEC Parameters Monitored or Inspected

Buried components are monitored for coating and wrapping integrity. A general visual inspection of exterior surface coatings for cracking, peeling, blistering, holidays (pinholes) or other coating failures will be performed on external surfaces of exposed components. Parameters monitored will include:

- External coating and wrapping condition
- Pipe wall thickness
- Tank plate thickness

IPEC parameters monitored and inspected will be consistent with NUREG-1801.

Detection of Aging Effects

NUREG-1801, Detection of Aging Effects

"Inspections performed to confirm that coating and wrapping are intact are an effective method to ensure that corrosion of external surfaces has not occurred and the intended function is maintained. Buried

IPEC00203039

piping and tanks are opportunistically inspected whenever they are excavated during maintenance. When opportunistic, the inspections are performed in areas with the highest likelihood of corrosion problems, and in areas with a history of corrosion problems, within the areas made accessible to support the maintenance activity.

The applicant's program is to be evaluated for the extended period of operation. It is anticipated that one or more opportunistic inspections may occur within a ten-year period. Prior to entering the period of extended operation, the applicant is to verify that there is at least one opportunistic or focused inspection is performed within the past ten years. Upon entering the period of extended operation, the applicant is to perform a focused inspection within ten years, unless an opportunistic inspection occurred within this ten-year period. Any credited inspection should be performed in areas with the highest likelihood of corrosion problems, and in areas with a history of corrosion problems."

Comparison to IPEC Detection of Aging Effects

Buried components will be inspected when excavated during maintenance activities to confirm that coating and wrapping are intact. If trending within the corrective action program identifies susceptible locations, the areas with a history of corrosion problems will be evaluated for the need for additional inspection, alternate coating, or replacement. Prior to entering the period of extended operation, plant operating experience will be reviewed to verify that an inspection occurred within the past 10 years. If an inspection did not occur, a focused inspection will be performed prior to the period of extended operation. A focused inspection will be performed within the first 10 years of the period of extended operation, unless an opportunistic inspection occurs within this ten-year period.

In addition to opportunistic inspections, the program will include periodic inspections. A corrosion risk assessment performed for each buried piping segment in the program will consider the individual piping material, soil resistivity, drainage, use of cathodic protection and coating, and assign risk weight based on these parameters. The results of this assessment will establish the inspection priority and the frequency for periodic inspections. An inspection plan will be developed based on the assessment of impact and the corrosion risk assessment of piping and tanks. The determination of inspection points will consider the results of previous inspections.

This program is credited with managing the following aging effects:

- loss of material from the external surfaces of buried stainless steel components (AMM01, 03)
- loss of material from the external surfaces of buried carbon steel and gray cast iron components (AMM04, 08, 12, 16, 18, 21, 24)

IPEC00203040

IPEC detection of aging effects will be consistent with NUREG-1801.

Monitoring and Trending

NUREG-1801, Monitoring and Trending

"Results of previous inspections are used to identify susceptible locations."

Comparison to IPEC Monitoring and Trending

Trending within the corrective action program will identify the need for additional inspections. If additional inspections are determined to be necessary, results of previous inspections will be used to identify susceptible locations.

IPEC monitoring and trending will be consistent with NUREG-1801.

Acceptance Criteria

NUREG-1801, Acceptance Criteria

"Any coating and wrapping degradations are reported and evaluated according to site corrective actions procedures."

Comparison to IPEC Acceptance Criteria

Coating and wrapping degradation will be reported and evaluated in accordance with the site corrective action program.

IPEC acceptance criteria will be consistent with NUREG-1801.

Corrective Actions

NUREG-1801, Corrective Actions

"The site corrective actions program, quality assurance (QA) procedures, site review and approval process, and administrative controls are implemented in accordance with the requirements of 10 CFR Part 50, Appendix B. The staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the corrective actions, confirmation process, and administrative controls."

Comparison to IPEC Corrective Actions

IPEC corrective actions will be in accordance with 10 CFR 50 Appendix B. The corrective actions may include scheduled inspections, change of coating system, or replacement of corrosion susceptible components.

IPEC corrective actions will be consistent with NUREG-1801.

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Confirmation Process

This attribute is discussed in Section 2.0, Background.

Administrative Controls

This attribute is discussed in Section 2.0, Background.

Operating Experience

NUREG-1801, Operating Experience

"Operating experience shows that the program described here is effective in managing corrosion of external surfaces of buried steel piping and tanks. However, because the inspection frequency is plant-specific and depends on the plant operating experience, the applicant's plant-specific operating experience is further evaluated for the extended period of operation."

Comparison to IPEC Operating Experience

The Buried Piping and Tanks Inspection Program is a new program. Plant and industry operating experience will be considered when implementing this program. Industry operating experience that forms the basis for the program is described in the operating experience element of the NUREG-1801 program description. IPEC plant-specific operating experience is not inconsistent with the operating experience in the NUREG-1801 program description.

The IPEC program is based on the program description in NUREG-1801, which in turn is based on industry operating experience. As such, operating experience assures that implementation of the Buried Piping and Tanks Inspection program will manage the effects of aging such that applicable components will continue to perform their intended functions consistent with the current licensing basis through the period of extended operation.

References

EN-DC-343, Rev. 1, "Buried Piping and Tanks Inspection and Monitoring Program"

IP2 Condition Report CR-IP2-2008-04754

Summary

The Buried Piping and Tanks Inspection Program will be effective for managing aging effects since it will incorporate proven monitoring techniques, acceptance criteria, corrective actions, and administrative controls. The Buried Piping and Tanks Inspection Program assures the effects of aging will be managed such that applicable components will continue to perform their

IPEC00203042

intended functions consistent with the current licensing basis through the period of extended operation.

The Buried Piping and Tanks Inspection Program will be consistent with program attributes described in NUREG-1801, Section XI.M34, Buried Piping and Tanks Inspection.

IPEC00203043

Entergy	CONDITION REPORT	CR-IP2-2009-00666

Originator: Rohla III,Otto R
Originator Phone: 5295
Originator Site Group: IP2 Operations Watch Staff IP2
Operability Required: Y
Supervisor Name: Gates,Clifton
Reportability Required: N
Discovered Date: 02/15/2009 15:29
Initiated Date: 02/15/2009 15:35

Condition Description:
Water filling floor guard collar on CST return line and spilling onto floor on 18' AFB. Chemist has been contacted for sampling.
Chemist reports 54ppB of Hydrazine in water.

Immediate Action Description:
Secured recirculation of CST-Hotwell. Chemist dispatched for sampling

Suggested Action Description:
Determine source of leakage

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
CST	HCLM/SR/MR	ACCUMU	AFW

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP2-2009-02874
CR	IP3-2009-00556
CR	IP3-2009-02788
CR	IP3-2009-02150
LOCR	LO-IP3LO-2009-00118 (Effectiveness Review)
LTCR	Approved by CARB on 5/14/09 w-Eng Director Present
TEAM 2C	
WON	00183296
WRN	00171129
WRN	00171130
WRN	00171137
WRN	WR#00156027
WRN	00171140
WRN	00171141
WRN	00171143

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
REPORT WEIGHT	1
HEP FACTOR	E
INPO BINNING	ER3
EL	ESPC
KEYWORDS	KW-LEAKS-WATER
KEYWORDS	KW-CONDENSATE STORAGE TANK

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TRENDING (For Reference Purposes Only):

Trend Type	**Trend Code**
KEYWORDS	KW-PIPE BREAK
KEYWORDS	KW-ENVIRONMENTAL DISCHARGE
UPGRADED CR CATEGORY	CAT B to CAT A
GRADE RCA	20.4
CAUSAL FACTOR	OP4A
CAUSAL FACTOR	OP2J
CAUSAL FACTOR	OP5E
LT-MOD/DESIGN	CA#14 Per NSA Director CARB chairperson
# PERIODIC REVIEW - INITIAL	

Attachments:

Condition Reportription
USER GENERATED PDF : 08/27/009 08:43:08
Condition Reportription
USER GENERATED PDF : 08/27/009 08:43:08
Condition Reportription
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IPEC00203045

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	Operations Watch Staff IP2	Dewey Jr,Donald J
Assigned To:	IP2	Engineering Director IP2	Burroni,Richard J
Subassigned To :			

Originated By:	Dewey Jr,Donald J	2/16/2009 01:51:36
Performed By:	McCaffrey,Thomas S	2/20/2009 10:49:09
Subperformed By:		
Approved By:		
Closed By:	Baker,John R	2/20/2009 13:28:38

Current Due Date: 02/20/2009 **Initial Due Date:** 02/20/2009

CA Type: OPERABILITY INPUT

Plant Constraint: #NONE

CA Description:

Develop an operability evaluation for the operability of the CST supply to the AFW pumps and the CST return line because of the suspected leakage below ground from either of these lines.

Response:

Based on investigateion of the pipe crack, it was recommeneded that the line be repaired. Based on this repair, no operability evaluation has been performed for the as found condition.

Subresponse :

Closure Comments:

Response accepted. Return line repairs in progress.

IPEC00203046

IPEC00203046

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	CRG-CARB-SARB IP2	Harrison,Christine B
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Harrison,Christine B 2/19/2009 10:17:18

Performed By:

Subperformed By:

Approved By:

Closed By: Harrison,Christine B 2/20/2009 12:07:45

Current Due Date: 03/11/2009 **Initial Due Date:** 03/12/2009

CA Type: DISP - ACE/HT

Plant Constraint: #NONE

CA Description:

Please perform higher-tier apparent cause evaluation and assign further corrective actions as required. Note that your evaluation is to be presented to CARB and a corrective action is being assigned to CA&A to document this presentation.

Response:

Subresponse :

Closure Comments:

2/20/09: At the direction of senior management, Category of this CR upgraded from a "B" to an "A". This CA is being closed to new CA-00004 which reflects this new assignment.

IPEC00203047

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 3

	Site	Group	Name
Assigned By:	IP2	CAA Staff IP2	Harrison,Christine B
Assigned To:	IP2	CAA Staff IP2	Harrison,Christine B
Subassigned To :			

Originated By:	Harrison,Christine B	2/19/2009 10:18:06
Performed By:	Tumicki,Michael L	5/15/2009 11:51:27
Subperformed By:		
Approved By:		
Closed By:	Tumicki,Michael L	5/15/2009 11:51:27

Current Due Date: 05/29/2009 **Initial Due Date:** 05/29/2009

CA Type: CARB REVIEW

Plant Constraint: #NONE

CA Description:

Document the results of the root cause analysis presentation to CARB.

IPEC00203048

IPEC00203048

Response:

5/14/09: The Root Cause Analysis was presented to, and accepted with edit by, the CARB with the NSA Director serving as chairman. The report received an average grade of 20.4. The CARB provided the following insight to be included in the report:
P 9 - remove words about estimated 10-12 gpm leak
P 10 - remove section about DC-343
P 16 - remove last sentence referencing att 9.4
P 19 - Delete the first paragraph under the title "Conditions That Lead To The Corrision and Leak" and remove the section titles
P 20 - add words about failure analysis performed by vendor and remove the section titles
P 22 - add backfill spec # in root cause paragraph
P 23 - delete CC2
P 25 section D - clarify "resources" is referring to specification for backfill and add construction worker practices/supervisory oversight during original construction to discussion
P 26 - second paragraph delete word "preliminary"
□Delete last two sentences on page
P 27 - extent of cause- last sentence delete words "when developed"
P 31 - #2 - change words so it is clear that 650,000 gallons is the lowest CST can drain to
□#4 and delete reference to CST trends
□Add bullet # 7 that city water backup is available if CST is unavailable
P 34 - delete CC2, CC3 from first line of causes
□Delete everything from second line of causes except CC2
□CC 1 change words to "need/feasibility" and replace words "any or all" with "selected"
□Change CC3 to CC2 and delete words "and accessability"
□Change CC3 to CC2 and change due date from from 9/15 to 11/15
□EOC - change words "once add'l inspection and analysis complete, assign actions needed and present to CARB
□Other - change teak to tank
P 35 - change all CC3's to EOC
□Delete entire EOC corrective action line -second from bottom of page
P 36 - under CAPR's delete all # 2 CAPR's from page
P 39 - label all attachments
□Add #3 - vendor pipe failure analysis
P 40 why staircase - add another box between bottom two boxes to say - use of blast rock from unit 3 was allowed as backfill

3/20/09: Per special CARB meeting and based on request by Site Vice President, approval was given by CARB to extend the due date for the completion of this root cause analysis to May 21, 2009.

Subresponse :

Closure Comments:

IPEC00203049

Entergy	CA DUE DATE EXTENSION	CR-IP2-2009-00666

Corrective Action : CR-IP2-2009-00666 CA-00003

Version: 1 **Approved:** ✓

Requested Duedate: 05/29/2009 **Previous Duedate:** 03/21/2009

Requested By: Tumicki,Michael L 03/20/2009

Approved By: Tumicki,Michael L 03/20/2009

Request Description:

The due date to perform the RCA evaluation CA #4 has been extended to 5/21/2009 to complete, evaluation and incorporation of a failure analysis into the RCA report. The extension of CA #4 was approved by the Site VP, CARB and P&C Manager IAW EN-LI-102 to exceed the 30 day disposition requirement. This administrative CARB tracking CA has been extended to accommodate the new RCA evaluation due date. There is no impact to Nuclear, Radiological, Environmental or Personnel safety by extending this CA. The CA&A Manager concurs with this extension.

Approved Description:

Approved per above discussion.

IPEC00203050

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 4

	Site	Group	Name
Assigned By:	IP2	CRG-CARB-SARB IP2	Harrison,Christine B
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :	IP2	P&C Eng Component Mgmt IP2	Manzione,Stephen J

Originated By:	Harrison,Christine B	2/20/2009 12:05:50
Performed By:	Azevedo,Nelson F	5/15/2009 15:12:27
Subperformed By:	Azevedo,Nelson F	5/15/2009 15:12:01
Approved By:		
Closed By:	Tumicki,Michael L	5/15/2009 16:08:19

Current Due Date: 05/20/2009 **Initial Due Date:** 05/21/2009

CA Type: DISP - RCA

Plant Constraint: #NONE

CA Description:

Please perform root cause analysis and assign further corrective actions as required. Note that your evaluation is to be presented to CARB within 30 days and a corrective action is being assigned to CA&A to document this presentation.

CA REFERENCE ITEMS:

Type Code	Description
CARB-ACCEPT W-EDIT	Minor

Response:

See sub response below.

Subresponse :

See attachment files for RCA and other supporting documentation. All CARB comments have been incorporate and all CAs have been assigned. No additional actions required under this CA.

Closure Comments:

The RCA report was presented to and accepted with edit by the CARB on 5/14/09. CA 3 captures the CARB comments. The CARB comments have been satisfactorly incorporated into the report and the revised report is attached to this CAs sub-response. This CA therefore closed.

CA re-opened to responsible department to extend per VP request. MLT 3/20/09

The Root Cause Report contains the required sections and discussion popints and has been approved by an independant reviewer and the Responsible Manager as indicated on the cover sheet. It is noted the CAs in the report CA plan are not presently in PCRS and owner has elected to issue the CAs associated with the RCA after CARB review. RCA Report accepted pending CARB review and approval. MLT 3/19/09

Attachments:

Subresp Description

- Root Cause Analysis Report
- Equipment Failure Evaluation
- K-T Analysis
- Why Staircase Analysis
- External Operating Experience Review
- Internal OE Review
- Part 1 - SIA Failure Analysis Report
- Part 2 - SIA Failure Analysis Report

IPEC00203051

IPEC00203051

Entergy	CA DUE DATE EXTENSION	CR-IP2-2009-00666

Corrective Action : **CR-IP2-2009-00666 CA-00004**

Version: 1 **Approved:** ✓

Requested Duedate: 03/22/2009 **Previous Duedate:** 03/13/2009

Requested By: De Donato,Anthony J 03/11/2009

Approved By: Reynolds,Joseph A 03/11/2009

Request Description:

It is acceptable to extend the due date since the condition was corrected; the leaking pipe was replaced and the system was restored to operable status. A preliminary extend of condition does not reveal any operability concerns to either unit. It is necessary to extend the due date since all sections of the "A" report will not be completed until next week, due to the complexity of the issues. P&CE Manager concurs with this extension.

Approved Description:

Additionally CAA discussed the issue with the NSA Director (CARB chairperson) who approved the extension. However the due date requested was to day 30. CARB needs time to review the report prior to the CARB meeting, therefore while the extension was approved, CAA pulled in the due date to 3/19/09.

IPEC00203052

Entergy	CA DUE DATE EXTENSION	CR-IP2-2009-00666

Corrective Action : CR-IP2-2009-00666 CA-00004

Version: 2 **Approved:** ✓

Requested Duedate: 05/21/2009 **Previous Duedate:** 03/20/2009

Requested By: De Donato,Anthony J 03/20/2009

Approved By: Tumicki,Michael L 03/20/2009

Request Description:

Necessary: An initial Root Cause evaluation was performed (< 30 days). The causes were based on the information available to date. The failure analysis of the failed pipe is still pending. It has been determined that the failure analysis should be completed, evaluated and the information incorporated into the RCA report prior to issue. More time is needed to accomplish this.

Acceptable: The CST pipe was returned to OPERABLE on 2/21/09 after replacement of the defective length of pipe. All Post Work testing was completed satisfactorily. Based on the initial RCA report there are no interim actions needed at this time other than those of an administrative nature such as tracking completion and evaluation of the failure analysis. There is no effect on Nuclear, Radiological, Environmental or Personnel safety by extending this CA.

The Site VP, CARB and P&C Manager concur with this extension.

Approved Description:

This extension will exceed the EN-LI-102 Attachment 9.4 CA due date guidance that a CAT A disposition should be completed in <= 30 days. EN-LI-102 contains due date extension approval guidance that allows extensions of the disposition of Significant Root Causes beyond 30 days provided Site VP and CARB approval is obtained. It is noted these approvals have been obtained and the request contains the additional discussion points needed. The new due date of 5/21/09 was also noted by the CARB. This extension is therefore approved.

IPEC00203053

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 5

	Site	Group	Name
Assigned By:	IP2	CRG-CARB-SARB IP2	Harrison,Christine B
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :	IP2	P&C Eng Component Mgmt IP2	Manzione,Stephen J

Originated By:	Harrison,Christine B	2/20/2009 12:08:52
Performed By:	Manzione,Stephen J	2/26/2009 09:53:59
Subperformed By:	Manzione,Stephen J	2/26/2009 09:53:41
Approved By:		
Closed By:	Harrison,Christine B	2/26/2009 09:56:54

Current Due Date: 02/26/2009 **Initial Due Date:** 02/26/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Please ensure problem statement for your root cause analysis is approved by CRG.

Response:

See subresponse

Subresponse :

The following problem statement was presented to and approved by the IPEC CRG on 2/26/09:

"On February 16, 2009, Unit 2 entered a 7 day shutdown AOT due to an underground leak in the condensate storage tank return line."

This item may be closed.

Closure Comments:

2/26/09: Problem Statement approved by CRG 2/26/09. This CA may be closed.

IPEC00203054

IPEC00203054

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 6

	Site	Group	Name
Assigned By:	IP2	CRG-CARB-SARB IP2	Harrison,Christine B
Assigned To:	IP2	Operating Experience Staff IP2	Bode,Paul M
Subassigned To :			

Originated By:	Harrison,Christine B	2/20/2009 12:10:14
Performed By:	Bode,Paul M	3/4/2009 09:32:09
Subperformed By:		
Approved By:		
Closed By:	Bode,Paul M	3/4/2009 09:32:09

Current Due Date: 04/01/2009 **Initial Due Date:** 04/01/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Please review this condition for possible OE distribution to the industry and the Entergy fleet.

Response:

Released to the industry as OE28335 - (Preliminary) Leaking underground Condensate Return Line pipe. (IPEC, IP2) . Consequently, this will be reviewed by each site as it enters the OE screening process from INPO. PMB

Subresponse :

Closure Comments:

IPEC00203055

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 7

	Site	Group	Name
Assigned By:	IP2	P&C Eng Manager IP2	Burroni,Richard J
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :	IP2	P&C Eng Component Mgmt IP2	Manzione,Stephen J

Originated By:	zzip2crg	2/26/2009 11:50:43
Performed By:		
Subperformed By:		
Approved By:		
Closed By:	Harrison,Christine B	3/2/2009 09:18:45

Current Due Date: 03/11/2009 **Initial Due Date:** 03/13/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Include CR-IP3-2009-00556 in your Root Cause Evaluation especially in the area of a potential underground piping leak. CR description is copied for your convenience "During a fire main leak investigation, under an approved troubleshooting plan, the Electric Fire Pump auto started 9 times in less than a 24 hour period. This was due to the excessive system leakage and Electric Fire Pump auto starting too early. The fire main leak was subsequently isolated. WR 157-68 and 157069 written. "

This CA written at the request of the P&C Mgr. (MLT CA&A)

Response:

Subresponse :

Closure Comments:

3/2/09: Per CRG discussion of CR-IP3-2009-00556, it has been determined that the condition in that CR does not relate to the condition in this CR. This CA is not required and is being closed.

IPEC00203056

IPEC00203056

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 8

	Site	Group	Name
Assigned By:	IP2	Licensing Staff IP2	Rokes,Charles B
Assigned To:	IP2	System Eng Primary System Mgmt IP2	Tesoriero,Michael V
Subassigned To :	IP2	System Eng Primary System Staff IP2	Curley,Kevin N

Originated By:	Rokes,Charles B	3/3/2009 08:23:29
Performed By:	Tesoriero,Michael V	3/14/2009 10:56:30
Subperformed By:	Curley,Kevin N	3/13/2009 04:55:08
Approved By:		
Closed By:	Rokes,Charles B	3/17/2009 11:25:38

Current Due Date: 03/20/2009 **Initial Due Date:** 03/20/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Assess the condition to determine if during past operation the condition resulted in inoperable TS components/systems such that the applicable TS AOT was exceeded for an inoperable TS component or the safety function could not have been performed. A TS volation would be a 60-day LER reportable under 10CFR50.73(a)(2)(i)(B). Any condition that could have prevented the fulfillment of the safety function of SSC that are needed to A) shutdown the reactor and maintain it in a safe shutdown condition, B) remove residual heat, C) control the release of radiioactive material, D) mitigate the consequences of an accident, would be reportable as a 60-day LER reportable under 10CFR50.73(a)(2)(v). Potential systems that could be applicable are the AFW System (TS 3.7.5) and the CST (TS 3.7.6).

Response:

See sub-response. The leak did not affect past operability. MVT

Subresponse :

The condition of the leak in the Condensate Return Line did not affect past operability of TS components, specifically the AFW System (TS 3.7.5) and the Condensate Storage Tank (TS 3.7.6) as demonstrated by the attached safety significance review. In short, AFW System was not affected as the Return Line was determined by calculation to remain operable. By conservative estimates the leak would have required an additional 21,600 gals above the 360,000 gal required for the 24hr decay heat removal of TS 3.7.6. This means that an additional 1.13 ft in CST level or a minimum of 17 ft indicated would have to be maintained to account for the additional loss from this past leakage. Except for outages, the plot of past CST level shows level was maintained far above that required by TS 3.7.6. Therefore this CA can be closed without further action.

Closure Comments:

CA response is acceptable and concludes there was no past inoperability. The reportability was updated to reflect the CA conclusion.

Attachments:

Subresp Description

Safety Significance CST Return Line Leak

IPEC00203057

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 9

	Site	Group	Name
Assigned By:	IP2	P&C Eng Programs Staff IP2	De Donato,Anthony J
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By:	De Donato,Anthony J	3/20/2009 07:22:20
Performed By:	Azevedo,Nelson F	4/4/2009 09:08:37
Subperformed By:		
Approved By:		
Closed By:	De Donato,Anthony J	4/20/2009 08:52:18

Current Due Date: 04/23/2009 **Initial Due Date:** 04/23/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Send out removed pipe from Line # 1509 for failure analysis. Track and evaluate results, provide results to RCA Team.

Response:

This section of piping has been sent to Structural Integrity Associates for failure analysis under contract No. 10229826.

Subresponse :

Closure Comments:

Received draft report from Structural Integrity. OK to close this CA.

IPEC00203058

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 10

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	Eng DE Civil Mgmt IP2	Drake,Richard S
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 13:50:27

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 12/16/2009 **Initial Due Date:** 12/17/2009

CA Type: CAPR

Plant Constraint: #NONE

CA Description:

CAPR: Update the buried piping backfill and excavation specification for IPEC as a site.

Response:

Subresponse :

Closure Comments:

IPEC00203059

IPEC00203059

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 11

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 13:52:00

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/09/2009 **Initial Due Date:** 09/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Implement improved inspection techniques for buried piping

Response:

Subresponse :

Closure Comments:

IPEC00203060

IPEC00203060

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 12

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By:	Azevedo,Nelson F	5/15/2009 13:53:04
Performed By:	Azevedo,Nelson F	5/18/2009 13:38:13
Subperformed By:		
Approved By:		
Closed By:	Azevedo,Nelson F	5/18/2009 13:38:13

Current Due Date: 05/21/2009 **Initial Due Date:** 05/21/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Send out removed pipe for failure analysis. Track and evaluate results

Response:

The failed pipe has been sent to Structural Integrity Associates and teh Failure Analysis has been completed. A copy of the Failure Analysis report has been attached to the root cause CA of this CR.

Subresponse :

Closure Comments:

IPEC00203061

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 13

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	Eng DE Civil Mgmt IP2	Drake,Richard S
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 13:59:36

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/23/2009 **Initial Due Date:** 09/24/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Research the original construction of this buried pipe for any additional backfill guidance that may have been available

Response:

Subresponse :

Closure Comments:

IPEC00203062

IPEC00203062

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 14

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:01:49

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 12/16/2009 **Initial Due Date:** 12/17/2009

CA Type: ACTION

Plant Constraint: LTCA DESIGN CHANGE

CA Description:

Evaluate the need/feasibility for cathodic protection to be used on selected buried piping. Initiate Engineering changes and present to the URT with results, as necessary.

CA REFERENCE ITEMS:

Type Code	Description
LTCA-MODIFICATIONS	Approved per CARB 5/14/09 w-Eng. Director present.

Response:

Subresponse :

Closure Comments:

IPEC00203063

IPEC00203063

Entergy

CORRECTIVE ACTION

CR-IP2-2009-00666

CA Number: 15

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	Eng DE Civil Mgmt IP2	Drake,Richard S
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:02:56

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 12/16/2009 **Initial Due Date:** 12/17/2009

CA Type: ACTION

Plant Constraint: LTCA DESIGN CHANGE

CA Description:

Evaluate the need for a drainage system and monitoring for CST lines, near Manhole #5. Initiate Engineering Changes and present to the URT, as necessary.

CA REFERENCE ITEMS:

Type Code	Description
LTCA-MODIFICATIONS	Approved per CARB 5/14/09 w-Eng. Director present.

Response:

Subresponse :

Closure Comments:

IPEC00203064

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 16

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	HQN	Vice President Engineering HQN	Abisamra,Joe M
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:06:17

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/29/2009 **Initial Due Date:** 09/30/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Ensure inspection locations are based on risk. Considering highly moist environments to be included in the procedure. Include Corporate Engineering Programs (CEP) for inspection guidance.

Response:

Subresponse :

Closure Comments:

IPEC00203065

IPEC00203065

Entergy	CA DUE DATE EXTENSION	CR-IP2-2009-00666

Corrective Action : **CR-IP2-2009-00666 CA-00016**

Version: 1

Approved: ✓

Requested Duedate: 09/30/2009

Previous Duedate: 06/15/2009

Requested By: Abisamra,Joe M 06/03/2009

Approved By: Azevedo,Nelson F 06/04/2009

Request Description:

Per the buried piping action plan, CEP-BPT-0100 development is on-going and EN-DC-343 revision has been initiated. These documents will become effective in September 2009.

Approved Description:

Approved. Note that the issue in this CA is already addressed in paragraph 5.4.3.2 and in Table 5-2 of CEP-BPT-0100. This CEP is currently undergoing Fleet review and it will be issued in September 2009. Therefore, this extension is required and reasonable.

IPEC00203066

IPEC00203066

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 17

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:13:33

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 11/14/2009 **Initial Due Date:** 11/15/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Evaluate the need to add cathodic protection to those areas of buried pipe whose inspections have indicated pipe defects.

Response:

Subresponse :

Closure Comments:

IPEC00203067

IPEC00203067

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 18

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:14:22

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/23/2009 **Initial Due Date:** 09/24/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Once additional inspections are complete, initiate additional CAs as required and present the results to CARB.

Response:

Subresponse :

Closure Comments:

IPEC00203068

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 19

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	Projects Mgmt IP2	Hinrichs,Gary H
Subassigned To :	IP2	Chemistry Staff IP2	Donahue,Patrick J

Originated By:	Azevedo,Nelson F	5/15/2009 14:15:42
Performed By:	Hinrichs,Gary H	7/21/2009 18:20:10
Subperformed By:	Donahue,Patrick J	7/20/2009 11:05:14
Approved By:		
Closed By:	Wittich,Walter	7/23/2009 12:25:59

Current Due Date: 07/23/2009 **Initial Due Date:** 07/23/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Evaluate the use of existing monitoring wells for buried pipe and tank leaks as early leak detection. Update monitoring wells testing requirements as necessary.

Response:

See attached response from the Groundwater Program Coordinator.

Subresponse :

The current ground water mionitopring program can effectively monitor for leaks from systems, structures, or components that contain or could contain licensed material and for which there is a credible mechanism for the licensed material to reach ground water. The existing program was designed to meet the intent of the NEI Ground Water Protection Initiative and would NOT BE effective at detecting any and all leakage from the various buried piping and buried tanks as part early leak detection. The existing program works by ensuring the detection of very low levels of readioactive contamination and the careful monitoring of plant activites that may adversely effect the containment of radioactive materials. Since the presence of licensed material is a primary indicator of leakage any system not containing such licensed materials would not be effectively monitored. The "RADIOACTIVE Ground Water Monitoring Program" is not the appropriate program to monitor other underground piping and tanks containing conventional liquids such as fuel oil, feedwater, steam, etc.

Closure Comments:

IPEC00203069

IPEC00203069

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 20

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	Operating Experience Staff IP2	Bode,Paul M
Subassigned To :			

Originated By:	Azevedo,Nelson F	5/15/2009 14:17:19
Performed By:	Bode,Paul M	6/17/2009 06:00:41
Subperformed By:		
Approved By:		
Closed By:	Bode,Paul M	6/17/2009 06:00:41

Current Due Date: 06/18/2009 **Initial Due Date:** 06/18/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Issue/revise an internal/external OE to the Industry for this Root Cause Evaluation in accordance with EN-OE-100

Response:

The attached updated OE was issued for industry release.PMB

Subresponse :

Closure Comments:

Attachments:

Resp Description

Updated OE

IPEC00203070

IPEC00203070

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 21

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:18:39

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/09/2009 **Initial Due Date:** 09/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Perform pipe inspection at the location; IP2 8" Condensate Return Line in the excavated area in the FRV Room

Response:

Subresponse :

Closure Comments:

IPEC00203071

IPEC00203071

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 22

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:19:35

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/09/2009 **Initial Due Date:** 09/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Perform pipe inspection at the location; IP2 12" Condensate Supply Line in the excavated area in the FRV Room

Response:

Subresponse :

Closure Comments:

IPEC00203072

IPEC00203072

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 23

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:26:58

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/09/2009 **Initial Due Date:** 09/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Perform pipe inspection at the location; IP2 24" SW Line 408 in the Transformer Yard outside the PAB where it exits the ground

Response:

Subresponse :

Closure Comments:

IPEC00203073

IPEC00203073

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 24

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:27:58

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/09/2009 **Initial Due Date:** 09/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Perform pipe inspection at the location; IP3 12" Condensate Supply Line outside the Auxiliary Feedwater Pump Building where it goes underground.

Response:

Subresponse :

Closure Comments:

IPEC00203074

Entergy | **CORRECTIVE ACTION** | **CR-IP2-2009-00666**

CA Number: 25

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:29:04

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/09/2009 **Initial Due Date:** 09/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Perform pipe inspection at the location; IP3 8" Condensate Return Line outside the Auxiliary Feedwater Pump Building where it exits the ground.

Response:

Subresponse :

Closure Comments:

IPEC00203075

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 26

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Azevedo,Nelson F 5/15/2009 14:29:58

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/09/2009 **Initial Due Date:** 09/10/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Perform pipe inspection at the location;IP3 24" Line 408 in the backup pump valve pit

Response:

Subresponse :

Closure Comments:

IPEC00203076

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 27

	Site	Group	Name
Assigned By:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Assigned To:	IP2	CAA Mgmt IP2	Tumicki,Michael L
Subassigned To :			

Originated By:	Azevedo,Nelson F	5/15/2009 14:31:12
Performed By:	Reynolds,Joseph A	5/20/2009 14:21:23
Subperformed By:		
Approved By:		
Closed By:	Reynolds,Joseph A	5/20/2009 14:21:23

Current Due Date: 05/28/2009 **Initial Due Date:** 05/28/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Issue an LOCA to track and document the RCA effectiveness review

Response:

As assigned LO document LO-IP3LO-2009-00118 was initiated and assigned to track and document the results of the effectiveness review performed to assess the actions when completed that corrected this CAT A CR issue. Both the assignment on the LO and the CARB Tracking CA was performed. This completed this assigned action, therefore this action was closed.

Subresponse :

Closure Comments:

IPEC00203077

IPEC00203077

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 28

	Site	Group	Name
Assigned By:	IP2	CAA Staff IP2	Tumicki,Michael L
Assigned To:	IP2	CAA Staff IP2	Harrison,Christine B
Subassigned To :			

Originated By: Tumicki,Michael L 5/15/2009 16:01:01

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 10/21/2009 **Initial Due Date:** 10/22/2009

CA Type: CARB REVIEW

Plant Constraint: #NONE

CA Description:

Document the CARB review for the completed inspections as discussed in CA #18 of this CR. CA 18 text reads "Once additional inspections are complete, initiate additional CAs as required and present the results to CARB."

Response:

Subresponse :

Closure Comments:

IPEC00203078

IPEC00203078

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 29

	Site	Group	Name
Assigned By:	IP2	P&C Eng Component Mgmt IP2	Manzione,Stephen J
Assigned To:	IP2	System Eng Support Staff IP2	Haggstrom,Matthew
Subassigned To :			

Originated By: Manzione,Stephen J 7/23/2009 16:59:37

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/15/2009 **Initial Due Date:** 09/16/2009

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Based on lessons learned, system engineering will evaluate the need to monitor city water usage on a routine basis

Response:

Subresponse :

Closure Comments:

IPEC00203079

IPEC00203079

Entergy	CORRECTIVE ACTION	CR-IP2-2009-00666

CA Number: 30

	Site	Group	Name
Assigned By:	IP2	CAA Mgmt IP2	Donnelly,John M
Assigned To:	IP2	P&C Eng Codes Mgmt IP2	Azevedo,Nelson F
Subassigned To :			

Originated By: Reynolds,Joseph A 8/7/2009 09:09:59

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 09/02/2009 **Initial Due Date:** 09/03/2009

CA Type: PERIODIC REVIEW

Plant Constraint: #NONE

CA Description:

Periodic Review CA
Please note, this CAT A CR has been open approximately 6 months, therefore requires a periodic review per attachment 9.8 of EN-LI-102. Ensure attachment 9.8 (attached) is completed. CAA observed this CR appears acceptable for classification as a Long Term CR as FEG week (RFO block on form) is needed to resolve several CAs on the CR (CA#s 21 through 26) . Therefore EN-LI-102 forms 9.8 and 9.9 have been attached to this CA for ease of reference. To classify the CR as a Long Term CR, discussion points from both forms needs to be captured in the CA response.

In accordance with EN-LI-102, Corrective Action Process, section 5.8 [5] (a) and/or (b) a periodic review of the CR is needed to assure the timeliness challenges for the issue resolution are understood, the impact to plant operations under the present plant conditions as well as the continued risk imposed by the action remaining open are acceptable, the repair priority is appropriate and the administrative CA processing expectations have been performed as expected thus far for the CR (i.e. CARB approvals, Extensions approved by correct level of management, etc).

As the CR owner, please review the Condition Report IAW EN-LI-102 section 5.8 [5] (a) (1) through (7) and document the resolution to the procedure discussion points.

IF your review determines the CR should also be reclassified as a Long Term CR, ensure the information requested in attachment 9.9 to LI-102 (another form available via the CA&A webpage) is captured in the CA response. Reclassifying the CR as long term (if appropriate) lengthens the periodic review to annually.

For all cases, LI-102 requires the Director or GMPO level position (or higher) that approved/acknowledged the acceptability of the periodic review conclusions to be documented.

Document the results of the periodic review in the response to this new CA. If used, attach the completed CR periodic review form (LI-102 - attachment 9.8) to the response section of this CA.

Remember the Long Term classification only applies if the restriction to completing the task involves one of the following four plant/process restrictions. (1) A Modification or Design Change must be completed to resolve the action, (2) More than one training cycle is required to complete the action, (3) Outside Regulator Agency (NRC, etc) approval is required to complete the action, (4) a Forced Outage or Refueling Outage or FEG week of sufficient duration is required to establish plant conditions to complete the action.

Response:

Subresponse :

IPEC00203080

IPEC00203080

Closure Comments:

Attachments:

Ca Description
Periodic Review form
LTCR classification form

IPEC00203081

Entergy	ADMIN	CR-IP2-2009-00666

Initiated Date: 2/15/2009 15:35 **Owner Site and Group:** IP2 P&C Eng Codes Mgmt IP2

Current Contact:

Current Significance: A

Closed by:

Summary Description:

Water filling floor guard collar on CST return line and spilling onto floor on 18' AFB. Chemist has been contacted for sampling.
Chemist reports 54ppB of Hydrazine in water.

Remarks Description:

CR #4 to perform a Root Cause evaluation was initially performed by the owner department on 3/19/09 (<30 days). The Site VP has requested the RCA be extended until failure analysis and evaluation of the failed section of pipe is complete. CA re-opened to owner department to extend. MLT 3/20/09.

Closure Description:

IPEC00203082

IPEC00203082

OperabilityVersion: 1

Operability Code: EQUIPMENT INOPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Spagnuolo,Frank M 02/16/2009 01:05

Approved By: Dewey Jr,Donald J 02/16/2009 01:34

Operability Description:

CST is inoperable due to external pipe leakage and the potential of draining the CST upon a pipe break.

Approval Comments:

Agree and Approve

IPEC00203083

OperabilityVersion: 2

Operability Code: EQUIPMENT INOPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Huron,Robert W 02/20/2009 17:34

Approved By: Baker,John R 02/20/2009 18:05

Operability Description:

CST was declared inoperable on Monday, Feb 16, 2009

Approval Comments:

Approved

IPEC00203084

OperabilityVersion: 3

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Spagnuolo,Frank M 02/24/2009 20:12

Approved By: Dewey Jr,Donald J 02/24/2009 20:42

Operability Description:

The CST was returned to OPERABLE on 2/21/09 at 0656 after replacement of the defective length of pipe. All Post Work testing has been completed satisfactorily.

Approval Comments:

Agree and Approve.

IPEC00203085

Version: 2

Significance Code: A

Classification Code: RCA

Owner Site and Group: IP2 P&C Eng Codes Mgmt IP2

Performed By: Harrison,Christine B 02/20/2009 12:11

Assignment Description:

2/20/09: At the direction of senior management, Category of this CR upgraded from a "B" to an "A". CA-00002 has been closed to new CA-00004 which reflects this new assignment. CARB Review CA has been edited to reflect this new assignment.

IPEC00203086

Entergy	A S S I G N M E N T S	CR-IP2-2009-00666

Version: 1

Significance Code: B

Classification Code: HT-ACE CARB

Owner Site and Group: IP2 P&C Eng Codes Mgmt IP2

Performed By: Harrison,Christine B 02/19/2009 10:53

Assignment Description:

IPEC00203087

IPEC00203087

Entergy	REPORTABILITY	CR-IP2-2009-00666

Reportability Version: 2

Report Number:

Report Code: NOT REPORTABLE

Boilerplate Code:

Performed By : Rokes,Charles B 03/17/2009 11:28

Reportability Description:

The recorded condition does not meet reporting criteria of SMM-LI-108 based on engineering response to CA-8 concluding the as-found condition and past condition did not result in inoperability of the AFWS. The condition of the leak in the Condensate Return Line did not affect past operability of TS components, specifically the AFW System (TS 3.7.5) and the Condensate Storage Tank (TS 3.7.6) as demonstrated by the attached safety significance review. The AFW System was not affected as the Return Line was determined by calculation to remain operable. By conservative estimates the leak would have required an additional 21,600 gals above the 360,000 gal required for the 24hr decay heat removal of TS 3.7.6. This means that an additional 1.13 ft in CST level or a minimum of 17 ft indicated would have to be maintained to account for the additional loss from this past leakage. Except for outages, the plot of past CST level shows level was maintained far above that required by TS 3.7.6.

IPEC00203088

IPEC00203088

Reportability Version: 1

Report Number:

Report Code: INDETERMINATE - EVAL

Boilerplate Code:

Performed By : Rokes,Charles B 03/03/2009 08:27

Reportability Description:

The impact of the condition on CST or AFW operability is not known therefore CA-8 was issued for SE to determine if the condition during past operation could have resulted in a TS violation or a safety system functional failure. A TS Prohibited condition would be a 60-day LER under 10CFR50.73(a)(2)(i)(B), and a SSFF would be a 60-day LER under 10CFR50.73(a)(2)(v).

IPEC00203089

Entergy	CONDITION REPORT	CR-IP2-2009-02874

Originator: Thayer,Christopher E
Originator Phone: 5298
Originator Site Group: IP2 Operations Watch Staff IP2
Operability Required: N
Supervisor Name: Bohren,Christopher
Reportability Required: N
Discovered Date: 07/25/2009 09:28
Initiated Date: 07/25/2009 09:35

Condition Description:

when NPO went to take conventional watch special log: 02-09-031 ensure LCV-1158 underground suction pipe isnt underwater..discovered suction piping covered on the west side to above the half diameter point with mud and silt. This is unsat and doesnt meet the intent of the special log .

Immediate Action Description:

pumped down water, informed CRS, rebuilt pump and stationed standby.

Suggested Action Description:

remove silt, dry and wrap pipe, fill in hole

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
AFW	AFW	AFW	AFW
LCV-1158	HCLS/SR/MR	VALVE	AFW

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP2-2009-00666
DOC	OPSW
TEAM 2A	

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
HEP FACTOR	E
INPO BINNING	ER1
EV	ESSE
KEYWORDS	KW-LOGS
KEYWORDS	KW-CONDENSATE
KEYWORDS	KW-AUXILIARY FEEDWATER
REPORT WEIGHT	1

IPEC00203090

Initiated Date: 7/25/2009 9:35 **Owner Site and Group:** IP2 P&C Eng Codes Mgmt IP2

Current Contact:

Current Significance: D

Closed by: Harrison,Christine B 8/4/2009 7:15

Summary Description:

when NPO went to take conventional watch special log: 02-09-031 ensure LCV-1158 underground suction pipe isnt underwater..discovered suction piping covered on the west side to above the half diameter point with mud and silt. This is unsat and doesnt meet the intent of the special log .

Remarks Description:

Closure Description:

7/28/09: Per CRG discussion, Maintenance Support is scheduled to clean this silt and mud out today. This CR can be closed to Track/Trend (reference CR-IP2-2009-00666).

IPEC00203091

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Spangenberger,Roy C 07/27/2009 16:12

Approved By: Schoen,Peter S 07/27/2009 16:16

Operability Description:

Water level in the excavation was requested to be checked "below the condensate return pipe" by engineering. Special log 2-09-031 was initiated to ensure the request was being addressed. Water intrusion into the excavated area by ground water seepage has been removed by operations on many occasions, by pumping accumulations from the area. The inleakage condition as caused silt and mud accumulations to collect around the pipe. Operations is still removing any water that can be pumped from the area. The CR was initiated to allow engineering to input the present condition, silt and mud buildup on the exterior bare piping surfaces, since the installed new piping has yet to be coated, and a proper backfill of the area performed. The engineering-requested special log was not designed to pose an operability question. The integrity of the pipe is not in question and no operablity concern exists.

Approval Comments:

agreed and approved

IPEC00203092

Entergy	A S S I G N M E N T S	CR-IP2-2009-02874

Version: 1

Significance Code: D

Classification Code: REVIEW EMERG TREND

Owner Site and Group: IP2 P&C Eng Codes Mgmt IP2

Performed By: Harrison,Christine B 08/03/2009 06:45

Assignment Description:

7/28/09: Per CRG discussion, Maintenance Support is scheduled to clean this silt and mud out today. This CR can be closed to Track/Trend (reference CR-IP2-2009-00666).

IPEC00203093

IPEC00203093

Entergy	CONDITION REPORT	CR-IP2-2009-03251

Originator: Lee,Robert C

Originator Phone: 6612

Originator Site Group: IP2 P&C Eng Codes Staff IP2

Operability Required: Y

Supervisor Name: Azevedo,Nelson F

Reportability Required: Y

Discovered Date: 08/18/2009 08:03

Initiated Date: 08/18/2009 08:24

Condition Description:

PT-3Y9, Flow Test for Underground SW Line 408 was performed on 8/6/09. The procedure was forwarded to the IST Engineer for completion of Section 7.0 of the procedure which requires his input and review. The test results were determined to be UNSAT on 8/17/09.

This test was previously performed in August 2005, also UNSAT, resulting in CR-IP2-2005-03358 being written. A corrective action included the revision to PT-3Y9 Acceptance Criteria, as permitted by the Code, and was implemented for PT-3Y10, for testing of the other 24" SW Header, Line 409. However, the revision was not implemented for PT-3Y9, resulting this most recent PT-3Y9 test UNSAT result. Therefore, no operability concerns exist, since this event is the result of the incomplete corrective action to revise PT-3Y9.

Immediate Action Description:

Informed SM and supervisor of UNSAT test result and wrote CR.

Suggested Action Description:

Based on previous evaluation performed under CR-IP2-2005-03358, revise PT-3Y9 to utilize a 15% reduction of the Expected SW flow to obtain the Minimum Expected SW flow.

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
LINE408	EX/SR	PIPE	SW

REFERENCE ITEMS:

Type Code	Item Desc
CR	CR-IP2-2005-03358 (PC End Codes CAT C closed)
PRC	PY-3Y9 Flow Test for Underground SW Line 408

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
INPO BINNING	PI2
HEP FACTOR	P
AP	OPMG
KEYWORDS	KW-PROCEDURE NOT UPDATED
KEYWORDS	KW-SURVEILLANCE
KEYWORDS	KW-IST
KEYWORDS	KW-CORRECTIVE ACTIONS INCOMPLETE
KEYWORDS	KW-SERVICE WATER
REPORT WEIGHT	1

IPEC00203094

IPEC00203094

Entergy	CORRECTIVE ACTION	CR-IP2-2009-03251

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	Operations Mgmt IP2	Williams,Anthony L
Assigned To:	IP2	Operations Procedure Mgmt IP2	Simpson,Glenn
Subassigned To :			

Originated By:	zzip2crg	8/20/2009 15:13:40
Performed By:	Main,Dennis E	8/26/2009 14:31:28
Subperformed By:		
Approved By:		
Closed By:	Main,Dennis E	8/27/2009 08:09:23

Current Due Date: 09/10/2009 **Initial Due Date:** 09/10/2009

CA Type: DISP - CA

Plant Constraint: #NONE

CA Description:

Please review and assign further corrective actions as required.

Response:

Previous CR only changed criteria for Line 409 (2-PT-3Y10). CA-2 issued to revise 2-PT-3Y09. No further actions required.

Subresponse :

Closure Comments:

IPEC00203095

Entergy	CORRECTIVE ACTION	CR-IP2-2009-03251

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	Operations Support Staff IP2	Main,Dennis E
Assigned To:	IP2	Operations Procedure Staff IP2	Stevens,Steve
Subassigned To :			

Originated By: Main,Dennis E 8/26/2009 14:29:43

Performed By:

Subperformed By:

Approved By:

Closed By:

Current Due Date: 01/13/2010 **Initial Due Date:** 01/14/2010

CA Type: ACTION

Plant Constraint: #NONE

CA Description:

Revise 2-PT-3Y9 to utilize a 15% reduction of the expected SW flow to obtain minimum expected SW flow (reference feedback IP2-6354 to 2-PT-3Y10 for similar change for line 409)

Response:

Subresponse :

Closure Comments:

IPEC00203096

IPEC00203096

Entergy	ADMIN	CR-IP2-2009-03251

Initiated Date: 8/18/2009 8:24 **Owner Site and Group:** IP2 Operations Procedure Mgmt IP2

Current Contact:

Current Significance: C

Closed by:

Summary Description:

PT-3Y9, Flow Test for Underground SW Line 408 was performed on 8/6/09. The procedure was forwarded to the IST Engineer for completion of Section 7.0 of the procedure which requires his input and review. The test results were determined to be UNSAT on 8/17/09.

This test was previously performed in August 2005, also UNSAT, resulting in CR-IP2-2005-03358 being written. A corrective action included the revision to PT-3Y9 Acceptance Criteria, as permitted by the Code, and was implemented for PT-3Y10, for testing of the other 24" SW Header, Line 409. However, the revision was not implemented for PT-3Y9, resulting this most recent PT-3Y9 test UNSAT result. Therefore, no operability concerns exist, since this event is the result of the incomplete corrective action to revise PT-3Y9.

Remarks Description:

Closure Description:

IPEC00203097

IPEC00203097

Entergy	OPERABILITY	CR-IP2-2009-03251

OperabilityVersion:	1	
Operability Code:	EQUIPMENT OPERABLE	
Immediate Report Code:	NOT REPORTABLE	
Performed By:	Kich,Frank M	08/18/2009 13:50
Approved By:	Primrose,Eugene	08/18/2009 14:18

Operability Description:

The acceptance criteria as stated in the surveillance procedure was not met, however, based on a review of CR IP2-2005-03358 and discussion with engineering, the test results are 5.6% below the expected flowrate which satisfies being within15% of the expected flowrate acceptance criteria identified in the referenced CR. Additionally, the test results from 2005 were 13.3% below the expected flowrate indicating an improvement in the systems integrity based on the 2009 test results. The problem, as stated in the condition description, is that the procedure was not revised as part of the corrective actions for CR IP2-2005-03358 to incorporate the correct acceptance criteria. There is no operability issue with the service water system and there is no LI-108 reportability associated with this condition.

Approval Comments:

Agree and approved

IPEC00203098

IPEC00203098

Entergy	ASSIGNMENTS	CR-IP2-2009-03251

Version: 1
Significance Code: C
Classification Code: CORRECT/ADDRESS
Owner Site and Group: IP2 Operations Procedure Mgmt IP2
Performed By: Reynolds,Joseph A 08/20/2009 15:42

Assignment Description:
Per 8/20/09 CRG, Please review and assign further corrective actions as required.

IPEC00203099

IPEC00203099

Entergy	REPORTABILITY	CR-IP2-2009-03251

Reportability Version: 1

Report Number:

Report Code: NOT REPORTABLE

Boilerplate Code:

Performed By : Prussman,Stephen G 08/19/2009 11:23

Reportability Description:

no operability issues so not reportable

IPEC00203100

IPEC00203100

Entergy	CONDITION REPORT	CR-IP2-1998-08158

Originator:	English,Christopher C	**Originator Phone:**	0
Originator Site Group:	IP2 TECH SUP-Waste Services Mgmt	**Operability Required:**	Y
Supervisor Name:	COLEMAN, KATHERINE L	**Reportability Required:**	N
Discovered Date:	09/16/1998 00:00	**Initiated Date:**	09/16/1998 00:00

Condition Description:

CR Date: 09/16/1998 14:41
CR Entered Date: 09/16/1998 14:52
Underground transmission personnel from Astoria discovered a leak in the 138 kv low pressure feeder (33332) outside the protected area on the unit 3 site during a routine inspection. The Astoria crew estimates 30 gallons of dielectric leaked from the feeder at a rate of 30 drops per minute. The oil is contained within the manhole. No injuries or outside impact. No waterway is affected.

Immediate Action Description:

Underground personnel reported the leak to CIG at 12:58 and CIG notified outside agencies including the NYSDEC. The Indian Point Control Room was not notified until 13:30.

The Astoria lab has been dispatched to sample the oil/water mixture for PCBs and Benzene. Astoria underground has arranged for the manhole to be pumped and the feeder will be repaired.

Suggested Action Description:

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
33332L			138K

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
IP	IP-OIL SPILL
EQ	EQ-EX

IPEC00203101

Entergy	CORRECTIVE ACTION	CR-IP2-1998-08158

CA Number: 1

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	E-CAPTAIN, CRS
Assigned To:	IP2	TECH SUP-Waste Services Mgmt	English,Christopher C
Subassigned To :			

Originated By:	E-CAPTAIN, CRS	9/17/1998 00:00:00
Performed By:	English,Christopher C	9/24/1998 00:00:00
Subperformed By:		
Approved By:		
Closed By:	English,Christopher C	9/24/1998 00:00:00

Current Due Date: 10/17/1998 **Initial Due Date:** 10/17/1998

CA Type: DISP - CORR ACTION

Plant Constraint: NONE

CA Description:

Review event and determine corrective actions. This is a process issue. (JH)

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	72235

Response:

Significance Level 3 Report
The Astoria underground crew discovered a leak on feeder 33332 during routine inspection. The manhole was pumped, the resulting non hazardous waste was disposed and the feeder was repaired. The crew notified CIG who notified the unit 2 CCR, WCDOH, NYSDEC. This item is complete.

Subresponse :

Closure Comments:

N/A

IPEC00203102

Entergy	CORRECTIVE ACTION	CR-IP2-1998-08158

CA Number: 2

	Site	Group	Name
Assigned By:	IP2	CA&A Staff	E-CAPTAIN, CRS
Assigned To:	IP2	ENG SYS-Elect/I&C Mgmt	Mccaffrey,Thomas S
Subassigned To :			

Originated By:	E-CAPTAIN, CRS	9/17/1998 00:00:00
Performed By:	Mccaffrey,Thomas S	9/18/1998 00:00:00
Subperformed By:		
Approved By:		
Closed By:	Mccaffrey,Thomas S	9/18/1998 00:00:00

Current Due Date: 09/24/1998 **Initial Due Date:** 09/24/1998

CA Type: CRS - FYI

Plant Constraint: NONE

CA Description:

Please review for impact on system.

CA REFERENCE ITEMS:

Type Code	Description
CRS ID	72236

Response:

There is no current impact. Oil Levels look satisfactory for the potheads. Will continue to monitor for possible impact on system.

Subresponse :

Closure Comments:

N/A

IPEC00203103

IPEC00203103

Entergy	ADMIN	CR-IP2-1998-08158

Initiated Date: 9/16/1998 0:00 **Owner Site and Group:** IP2 TECH SUP-Waste Services Mgmt

Current Contact:

Current Significance: C - CORRECT ONLY

Closed by: e-CAPtain, CRS 9/24/1998 0:00

Summary Description:

199808158 - Underground transmission personnel from Astoria discovered a leak in the 138 kv low pressure feeder (33332) outside the protected area on the unit 3 site during a routine inspection. The Astoria crew estimates 30 gallons of dielectric leaked from the feeder at a rate of 30 drops per minute. The oil is contained within the manhole. No injuries or outside impact. No waterway is affected.

Remarks Description:

Per DMRG close to MWO 98-02381 (pav)

Closure Description:

PCRS Conversion

IPEC00203104

IPEC00203104

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: REPORTABLE - 4 HOUR

Performed By: WATCH 09/16/1998 00:00

Approved By: WATCH 09/16/1998 00:00

Operability Description:

OPERABILITY CHECK LIST:
Does the CR directly affect a structure, system or component (SSC) within the above list of applicability?
Is the CR in an area, or interface with an SSC from the above list?

Operability Check List Summary (See Full Check List Attached):

REPORTABILITY CHECK LIST:

20) I am making a 4 hour non-emergency notification. Yes

NOTIFICATION LOG
STA Reviewer: SWS Approval:
Reviewer Comment:
E2MIS No. 119784. The event was not directly reported to IP2. It was reported to CIG and CIG notified IP2 that an outside agency (DEC) was notified at approximately 1330. Per CIG Steve Romero, there was no release to the environment.

Date / Time: 16-Sep-98 14:00
Notification Party: Other
Person Notified:
Line:
Title: SEC, Chris English
Instructions:

Date / Time: 16-Sep-98 16:00
Notification Party: Assist. Ops Manager
Person Notified: B. Durr
Line:
Title:
Instructions:

Date / Time: 16-Sep-98 16:02
Notification Party: NRC Inspector
Person Notified: J. England
Line:
Title:
Instructions:

Date / Time: 16-Sep-98 16:05
Notification Party: NYPA
Person Notified:
Line:
Title: Rich Parks
Instructions:

Date / Time: 16-Sep-98 16:10
Notification Party: Public Information
Person Notified: ConEd Public Info
Line:

IPEC00203105

Title: Joan Bailey
Instructions:

Date / Time: 16-Sep-98 16:39
Notification Party: Notification By
Person Notified: M. Savino
Line:
Title:
Instructions:

Approval Comments:

IPEC00203106

Entergy	**A S S I G N M E N T S**	**CR-IP2-1998-08158**

Version: 1

Significance Code: C - CORRECT ONLY

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP2 TECH SUP-Waste Services Mgmt

Performed By: e-CAPtain, CRS 09/24/1998 00:00

Assignment Description:

IPEC00203107

IPEC00203107

Root Cause Analysis Report

CST Underground Recirc Line Leak

CR-IP2-2009-00666

REPORT DATE: 05-14-2009, Rev. 0

Root Cause Evaluator:	**Anthony DeDonato**	**5/14/09**
Team Leader (optional)	**Steve Manzione**	**5/14/09**
Reviewer:	**Bob Sergi**	**5/14/09**
Responsible Manager:	**Mike Tesoriero**	**5/14/09**
(APPROVALS ABOVE REQUIRED BEFORE CARB REVIEW)		
CARB Chairman:	**Pat Conroy**	**5/14/09**

Authenticated by Electronic Signatures in PCRS (LI-118, [3.0](8) b.3)

IPEC00203108

Problem Statement

"On February 16, 2009, Unit 2 entered a 7 day shutdown AOT due to an underground leak in the condensate storage tank return line."

Team Members

Team Lead	Steve Manzione
Root Cause Qualified Evaluator	Anthony DeDonato
P & C Engineering	Nelson Azevedo
	Robert Lee
K-T Member	Lizabeth Lee
EFin	Greg Bouderau
Civil Engineering	Kai Lo
Mechanical Engineering	John Bencivenga
Operations	Jan Mayer
CA&A	Mike Tumicki
Fleet	Joe Abisamra

IPEC00203109

Event Narrative

On February 15, 2009, a CR was entered at 1629 EST. An Operator observed water filling the floor guard collar on the CST return line and spilling onto the floor on the 18' AFB pump area. Operations secured recirculation of CST-Hotwell. The Chemistry Department was contacted for sampling the spilling fluid. The Chemist reported 54ppb of Hydrazine in the water, which identified the water as condensate. CST was declared inoperable on Monday, February 16, 2009 at 0205 EST. Unit 2 was operating at 100% Rx power throughout the event.

The source of the leak was determined to be just outside of the Auxiliary Feed Pump Room (AFPR) based on observations of the leakage at the pipe collar in the AFPR, the leakage observed from Manhole #5 just outside the AFPR door, and Engineering experience and judgment of the leak to be near a pipe bend. Work forces were mobilized and boring through the concrete slab and excavation of the pipes was commenced. The area was full of water, just below the concrete slab. A vacuum truck was used to remove the water and fine debris from the area. Larger objects were removed by hand.

Workers reported the material was mostly clay under the floor. There was no evidence of any sand around the pipes. Some construction debris was also unearthed. Based on the condition of portions of the coating, the through wall leak and other defects on the pipe, a decision was made to replace the section of the pipe.

<u>Timeline of Major Events</u>

Sunday, 2/15/09 @ approximately 1500	Water was identified leaking into the IP2 Auxiliary Feedwater Pump Building through a vertical pipe sleeve for the 8 CST return line.
Sunday, 2/15/09 @ approximately 1600	Chemistry results show 54ppb Hydrazine, which indicates it is condensate. The FSS contacts the Engineering Duty Manager (EDM). A conference call is held between Engineering management and supervisors.
Sunday, 2/15/09 @ approximately 1900	The EDM arrives on site, inspects the pipe sleeve, confirms water is rising up and requests another chemistry sample for confirmation of condensate.
Sunday, 2/15/09 @ approximately 2100	Further Engineering inspection reveals water is leaking into Manhole #5 at two locations through the masonry joints. (Manhole #5 is located in the FRV Room approximately 5' west of the underground location of the 8" line.) The Watch Chemist is instructed to take samples of incoming flows into Manhole #5.

IPEC00203110

Timeline of Major Events (continued)

Monday, 2/16/09 @ approximately 0205	The CST was declared inoperable and entered the 7-day AOT. Chemistry samples confirm the water is condensate in both the pipe sleeve and the effluents entering Manhole #5. The group decided to meet at 10:00 AM the following morning.
Monday, 2/16/09 @ approximately 1200	Civil Engineering maps out the line location underground and determines the area to be excavated based on the configuration of the pipe. Construction is mobilized.
Monday, 2/16/09 @ approximately 1900	Core drilling operations commenced in preparation of slab removal for excavation of the area. First indications that water saturation is present under the slab. Demolition by jackhammer is not allowed due to possible undermining.
Monday, 2/17/09 @ approximately 0500	Core drilling operations in progress; the first 2' x 2' section of the slab is removed. Standing water is present under the slab. Three small sump pumps are needed to keep up with the water.
Monday, 2/17/09 @ approximately 1700	Removal of the concrete slab was completed.
Tuesday, 2/17/09 @ approximately 2200	Shoring is installed in the excavation; a containment area for removed soil is set up.
Tuesday, 2/17/09 @ approximately 2400	The vacuum truck arrives on site.
Wednesday, 2/18/09 @ approximately 0230	Excavation of the site begins.
Wednesday, 2/18/09 @ approximately 1800	Chemistry increases the amount of Hydrazine in the Condensate System and monitors the level of Hydrazine in the area.
Wednesday, 2/18/09 @ approximately 2100	Operations calculates the make up to the CST is approximately 17gpm. Chemistry confirms the leak in the 8" line to the CST based on rising Hydrazine levels in Manhole #5.

IPEC00203111

Timeline of Major Events (continued)

Thursday, 2/19/09 @ approximately 0100	12" pipe is exposed and no leakage is seen.
Thursday, 2/19/09 @ approximately 0330	8" pipe is exposed and the leak is seen at the horizontal section of the pipe.
Thursday, 2/19/09 @ approximately 0400	Engineering assesses the leak is located at the 5:00 position of the pipe and determines the pipe is structurally sound to accept a housekeeping patch.
Thursday, 2/19/09 @ approximately 0600	A full circle clamp with longer bolts is installed over the leak; it slows it down enough for the sump pumps to keep up with dewatering, allowing further inspections.
Thursday, 2/19/09 @ approximately 1200	Abatement of the coal-tar coating begins.
Thursday, 2/19/09 @ approximately 2100	Abatement is completed; visual inspection and UT of the line is started.
Thursday, 2/19/09 @ approximately 2230	Visual inspection and UT of the line is completed. Several areas of minor degradation were found on the lower elbow and horizontal section of the pipe. A decision was made to replace the elbow and damaged section of the pipe.
Friday, 2/20 @ approximately 0100	Shop work on the replacement pipe is started.
Friday, 2/20 @ approximately 0500	Shop weld is completed. NDE was performed on the weld, MT SAT.
Friday, 2/20 @ approximately 0500	Entered a 72-hour AOT for 22ABFP in order to accommodate the pipe and elbow replacement and isolated line #1509.

IPEC00203112

Timeline of Major Events (continued)

Friday 2/20/09 @ approximately 1200	Pipe and elbow section removed.
Friday 2/20/09 @ approximately 1700	Pipe fitted into place. Weld out of two field welds begins.
Saturday 2/21/09 @ approximately 0400	Work completed, NDE performed, MT reading SAT, Operations commence clearance of PTO and filling line.
Saturday 2/21/09 @ approximately 0530	Line verified fill, in service VT-1 leak inspection performed by Operations; no leaks observed.
Saturday 2/21/09 @ approximately 0600	ABFP 22 declared operable, exited the 72-hour AOT.
Saturday 2/21/09 @ approximately 0630	CST Line declared operable, exited the 7-day AOT. All work secured.

IPEC00203113

Event Narrative

Background Information

- Lines 1505 and 1509 are carbon steel, schedule 40. Line 1505 is the 12" supply from the CST to the AFPs. Line 1509 is the 8" CST return line. These lines were deemed not to require cathodic protection during original plant design due to favorable soil resistivity and drainage characteristics. As a defense against localized corrosion attack, however, lines 1505 and 1509 were externally coated with coal tar enamel and have a coal tar enamel saturated felt overwrap. These pipes are sloped from the CST elevation to the AFPB, and are each approximately 320-330 feet in length.

- Several months prior, a similar event occurred when water was observed at the same pipe sleeve. Excavation of the CST lines at 2 locations was in-progress at this time of inspection. The leak was attributed to groundwater due to the open excavations. No hydrazine was detected. This was based on Chemistry testing for activity, pH and hydrazine.

- The backfill that was used in this area during original installation contained various size rocks and other foreign material such as cans and wire. The backfill used was for a light load area.

- Groundwater is suspected to also infiltrate the area.

- Line 1509 does not experience "movement". The buried pipe is installed below the freeze line. Other than seismic activity, there is no ground movement accounted for in the design nor anticipated to occur. Thermal expansion is very small due to the small delta T that may be experienced if the water from the CST was at its high temperature of approximately 100 degrees °F. However, thermal growth would not cause pipe movement since the pipe is restrained by the ground in the vertical rise at both ends.

- The area is used as a walkway. If there is significant heavy load on top of the slab and the fill has 3" to 8" large rocks (confirmed by observers), the heavy load can force the pipe to deflect downward and pinch on the rock, causing damage to the coating.

- Underneath the 6'x 6' cut hole on the floor slab, the fill was washed out locally.

- AFW building is supported by the foundation and containment building wall. The foundation is into the bedrock and loss of fill will not affect the load transfer capability from the slab, to the wall, to the foundation and onto the bedrock. The containment mat foundation is into the bedrock and will not be affected by the leak.

IPEC00203114

Background Information (continued)

- Sections of the bituminous type wrap were discovered damaged some voids around the area of the leak and 90° elbows.

- The specific 1989 ASME Code requirement to be met for the buried pipe #1509 is IWA-5244(c) which requires verification of non-impairment of flow in the non-isolated and non-redundant line to the heat sink. This specific requirement is met by performance of a pump test which verifies the ability to obtain and control recirculation flow. This inspection is required to be performed three times within the 10 year interval. Successful performance of PT-Q34 in conjunction with the PI-3Y4A Inservice Inspection services as verification of non-impairment of flow.

- Seismic concerns: based on outside study, historical seismic activities around IPEC from 1974 until 2007 fell into a range of modified Mercalli scale of 2.4 to 3.0. The range of seismic activity at the plant is less than 3.0 (0.007g) and IPEC is designed to M = 6.5, well below the plant's design ground response spectrum. The leak location has exterior surface/coating damages that appeared to be caused by impact from large, angular external object. It is highly unlikely that uniform seismic ground movement with a buried pipe could cause such a surface impact.

- An Entergy Engineering Fleet Call was conducted on March 4, 2009, which discussed the failure of the CST return line #1509.

CST Operation and Secondary leak detection

The condensate Storage Tank (CST) supplies makeup water to the Condensate System and to the Auxiliary Feed Water Pumps (AFP) during hot shutdown decay removal via a common 12" underground pipe. The CST is sized to supply a minimum inventory of 360,000 gals for 24 hrs of decay removal in hot standby following a plant trip as well as additional inventory for Condensate operation. This 12" supply line first feeds an 8" common AFW supply header in the ABFP, and then is routed to the Turbine Bldg via LCV-1158 which will automatically isolate make up to the Condensate System to protect this minimum inventory for AFW in this 600,000 gal design capacity tank. An 8" return header off condensate pump discharge is routed underground back to the CST for inventory control. AFPs recirc back to the CST via individual 3" lines that tap into this 8" Condensate Return header to maintain minimum design pump flow whenever running AFPs are not feeding Steam Generators.

Normal operational lineup in the Turbine building is as follows, the CST supply valves (LCV-1127 & 1128A) to the condenser hotwells are throttled open in manual control. Condensate System return is controlled in manual via LCV-1129 which is normally kept shut in warm weather. In the winter, LCV-1129 is throttled open to maintain CST temperature between 50 and 65°F. Summer CST temperatures can range in the 80's.

IPEC00203115

CST Operation and Secondary Leak Detection (continued)

A mobile unit supplies primary water to U2 via portable demineralizers to the three U1 Condensate Storage Tanks. From here, water factory Deaerator Booster Pumps supplyU2 condensate makeup to the Drains Collecting Tank (normal path) or to the U2 CST. Flow to the Drains Collecting Tank (DCT) is adjusted using Booster Pump (BP) flow (FI-531) or Primary Water Flow to the DCT (FIT-10001) meters for rough monitoring of manual changes.

Operators control secondary makeup by monitoring average Hotwell level in the Control Room. They attempt to match BP flow to the DCT with condensate losses. These losses include 100 gpm S/G Blowdown (or 70 gpm cold), 20 gpm Aux Steam heating (winter), 10-20 gpm condensate leakage and steam loss. Other than S/G blowdown there are no meters to track process losses. Operators allow CST level to track down slowly to makeup for the difference between DCT supply and secondary losses

Operations initially estimated the return line loss at 17gpm by shutting LCV-1158 and 1129 and subtracting the difference in CST rates of level change. This assumes no leak by LCV-1158 and no siphon break in the Return line.

A 10 gpm loss equals 14, 000 gallons a day. This equates to a CST level loss of 9 in/day or 3/8 in/hr. This would be hard to detect by monitoring CST level changes because the indicator in the CCR has intervals of feet, and such small changes cannot be visibly seen unless tracked over a few days. Since the CST is not the primary means of making up secondary losses, a 10 gpm leak would go unnoticed by watching CST levels. Hotwell level is maintained at about 4' or 76,000 gals. At 19,000gal/ft., a 10 gpm loss equates to about 3/8 in/hr change in hotwell level. Since operators maintain hotwell level within a close band, leak rate changes can't be detected by hotwell level.

IPEC00203116

Event Narrative

IPEC Buried Piping and Tank Inspection and Monitoring Program

The IPEC Buried Piping and Tank Inspection and Monitoring Program, hereafter simply referred to as BPT Program, is under development. The foundational elements of the program have been completed per scheduled milestones identified in Entergy fleet procedure EN-DC-343, which went into effect on Nov. 19, 2007. The fleet procedure required that all systems having buried portions of piping be included in the program, including but not limited to those systems that were identified in the IPEC License Renewal Application (LRA).

Once all buried piping systems were identified, the piping was assessed as having High, Medium or Low Impact, based on the consequences of a failure of the piping in the following areas:

- Safety (High = Nuclear Safety Related; Medium = Augmented Quality/Category M; Low = non-safety related)
- Public risk (High = potential radiological consequence; Medium = environment discharge or hazardous fluid; Low = non-contaminated, non-hazardous fluids)
- Economic impact of equipment failure on plant operation (High = >$1M; Medium = $100K - $1M; Low = <$100K.)

Table 1 presents the details for performing the impact assessment.

Using the impact assessment results, the High Impact systems are Corrosion Risk assessed with consideration of the following four (4) factors:

1. Soil resistivity
2. drainage
3. material
4. coatings/cathodic protection.

Tables 2 and 3 present the details for performing the corrosion risk assessments. Corrosion risk assessments were performed sequentially for the High, Medium and Low Impact system.

IPEC00203117

IPEC Buried Piping and Tank Inspection and Monitoring Program (continued)

In conjunction with the corrosion risk assessments, the inspection priorities for performing the initial inspections and subsequent inspection intervals were determined for each buried piping system based on the results of the Impact and Corrosion Risk assessments. Table 4 provides the guidance for scheduling these inspections.

Buried pipe inspection parameters will include:

- External pipe coating and wrap condition
- Pipe wall thickness
- Cathodic Protection effectiveness (if applicable)

Current plans are for a Central Engineering Programs document for buried pipe and tanks be developed (target issue by end of 2009), and for each site to manage its buried pipe activities (surveys, excavations, inspections, etc.) using IDDEAL Scheduleworks, or similar software.

IPEC License Renewal Application (LRA) commitments for Buried Piping and Tanks Program:

IP2	Commitment NL-07-039	Sept. 28, 2013
IP3	Commitment NL-07-153	Dec. 12, 2015

The excavations and inspections of the IP2 AFW lines to the CST were performed in response to the ISE Panel recommendation to complete same by the end of 2008.

IPEC00203118

Utility Experience

Most utilities are in the process of early Buried Piping and Tank Program development. Some (as IPEC, in 2005) have received INPO AFI's for non-functioning Cathodic Protection systems for their buried piping. At IPEC, however, Cathodic Protection systems are generally not provided for buried piping systems (exceptions being the sewage treatment pipeline, and underground diesel fuel oil lines). Resolution of the IPEC AFI is focused on correcting deficiencies in the installed cathodic protection system.

According to the Unit 2 and Unit 3 USFARs, the basis for not providing cathodic protection systems for buried piping was an engineering study performed during original licensing of the plants. Determinations of the soil resistivities at locations away from the river were concluded to be sufficiently high to preclude the need for cathodic protection for buried piping. The study recommended the application of protective coating to prevent local corrosion attack. Based on recent resistivity testing, the original resistivity determinations remain consistent.

An EPRI guidelines document (1016456) for an effective buried pipe program was issued in Dec. 2008. Future revision to the document is planned and will include:

- Buried tanks
- Non-metallic pipe

Industry initiatives are being taken to identify underground piping assessment technologies to perform assessments of coating integrity/condition, to identify degraded pipe locations and to quantify associated wall loss.

The EPRI buried piping guidance document has identified several methods that are used in the gas and oil pipe lines industries, but has not endorsed them.

IPEC00203119

Table 1 – Impact Assessment

	High	Medium	Low
Safety (Class per EN-DC-167)	Safety-related	Augmented QP and Fire Protection	Non-Safety related
Public Risk	Radioactive Contamination e.g. Tritium	Chemical/Oil-Treated System Gases	Untreated Water, SW, Demineralized Water
Economics (Cost of buried equipment failure to the plant)	> $1M or potential shutdown	$100K - $1M	< $100K
Notes: 1.	Any buried section with at least one High Impact gets an overall High Impact rating.		
2.	Any buried section with no High Impact rating but at least one Medium Impact rating gets an overall rating of Medium Impact.		
3.	Any buried section with all Low Impact ratings is to be rated as Low Impact.		

IPEC00203120

Table 2 – Corrosion Risk Assessment

Soil Resistivity Ω-cm (Note 1)	Corrosivity Rating	Soil Resistivity Risk Weight
> 20,000	Essential Non-Corrosive	1
10,001 – 20,000	Mildly Corrosive	2
5,001 – 10,000	Moderately Corrosive	4
3,001 – 5,000	Corrosive	5
1,000 – 3,000	Highly Corrosive	8
< 1,000	Extremely Corrosive	10
Drainage		Drainage Risk Weight
Poor	Continually Wet	4.0
Fair	Generally Moist	2.0
Good	Generally Dry	1.0
Material		Material Risk Weight
Carbon and Low Alloy Steel		2.0
Cast and Ductile Iron		1.5
Stainless Steel		1.5
Copper Alloys		1.0
Concrete		0.5
Cathodic Protection	Coating	CP/Coating Risk Weight
No CP	Degraded Coating	2.0
No CP	Sound Coating	2.0
No CP	No Coating	1.0
Degraded CP	Degraded Coating	1.0
Degraded CP	Sound Coating	1.0
Degraded CP	No Coating	0.5
Sound CP	Degraded Coating	0.5
Sound CP	Sound Coating	0.5
Sound CP	No Coating	0.5

Note: Soil resistivity measurements must be taken at least once per 10 years unless areas are excavated and backfilled or if soil conditions are known to have changed for any reason.

IPEC00203121

Table 3 – Corrosion Risk Tabulation

Corrosion Condition	Risk Weight Points
Soil Conditions Resistivity Drainage	 1 – 10 1 – 4
Materials Material	 0.5 – 2
Component Protection Cathodic Protection / Coating	 0.5 – 2
Final Corrosion Risk Tabulation Multiply all weights together in Steps 5.5 [2] (a) thru (d)	 0.25 – 160

Corrosion Risk:	High	61 – 160 points
	Medium	30 – 60 points
	Low	0 – 29 points

IPEC00203122

<u>Table 4 – Inspection Intervals vs Inspection Priority</u>

Impact – Corrosion Risk	Inspection Priority	Initial Inspection (Years)	Inspection Interval (Years)
High-High	High	5	8
High-Medium	High	5	8
Medium-High	High	5	8
High-Low	Medium	8	10
Medium-Medium	Medium	8	10
Low-High	Medium	8	10
Medium-Low	Low	10	15
Low-Medium	Low	10	15
Low-Low	Low	10	15

Notes:

1. High priority initial inspections shall be scheduled within 5 years. Subsequent high priority inspections shall be scheduled within 8 years thereafter.
2. Medium priority initial inspections shall be scheduled within 8 years. Subsequent medium priority inspections shall be scheduled within 10 years thereafter.
3. Low priority initial inspections shall be scheduled within 10 years. Subsequent low priority inspections shall be scheduled within 15 years thereafter.
4. Regardless of the above inspection schedule (reference EN-DC-343), compliance with IPEC LRA commitments prevail.
5. Once initial inspections are performed and conditions before known, a re-prioritization may maintain, decrease or increase a component future inspection priority.

The CST line (#1509) was assessed per EN-DC-343 to be a "High" inspection priority.

IPEC00203123

Previous Inspections of CST 8" Line

As a result of the Indian Point Independent Safety Evaluation (ISE) Report dated July 31, 2008, the following recommendation (R-7) was issued via LOCR IP3LO-2008-00151, CA-19: "to explore options for reducing the vulnerability of buried piping to the occurrence of any future unanticipated leak. Such options include excavating a few selected locations to confirm the presence of protective coating on the piping, as well as to measure and confirm the existence of sufficient wall thickness of the thus exposed piping using existing inspection techniques." Two areas of the Unit 2 CST lines were selected for inspection. The following information was retrieved from CR IP2-2008-04754.

The three CST pipes (Aux Feed Pump supply, CST return and CST overflow) were exposed at two locations for approximately 10' piping runs each.

The three inspected lines were: 12" Line 1505, AFP Suction line,
8" Line 1509, Condensate supply to the CST
10" Overflow Line (no line number assigned, corrugated metal pipe to Manhole #5

Upper and lower holes were excavated. An inspection in the upper hole identified five areas which required coating repair. UT thickness measurements were also performed on those areas where the base metal was exposed and these inspections confirmed that the pipe thickness remains at nominal thickness (i.e. within the manufacturer's tolerance). All of these activities were performed under WO 164495.

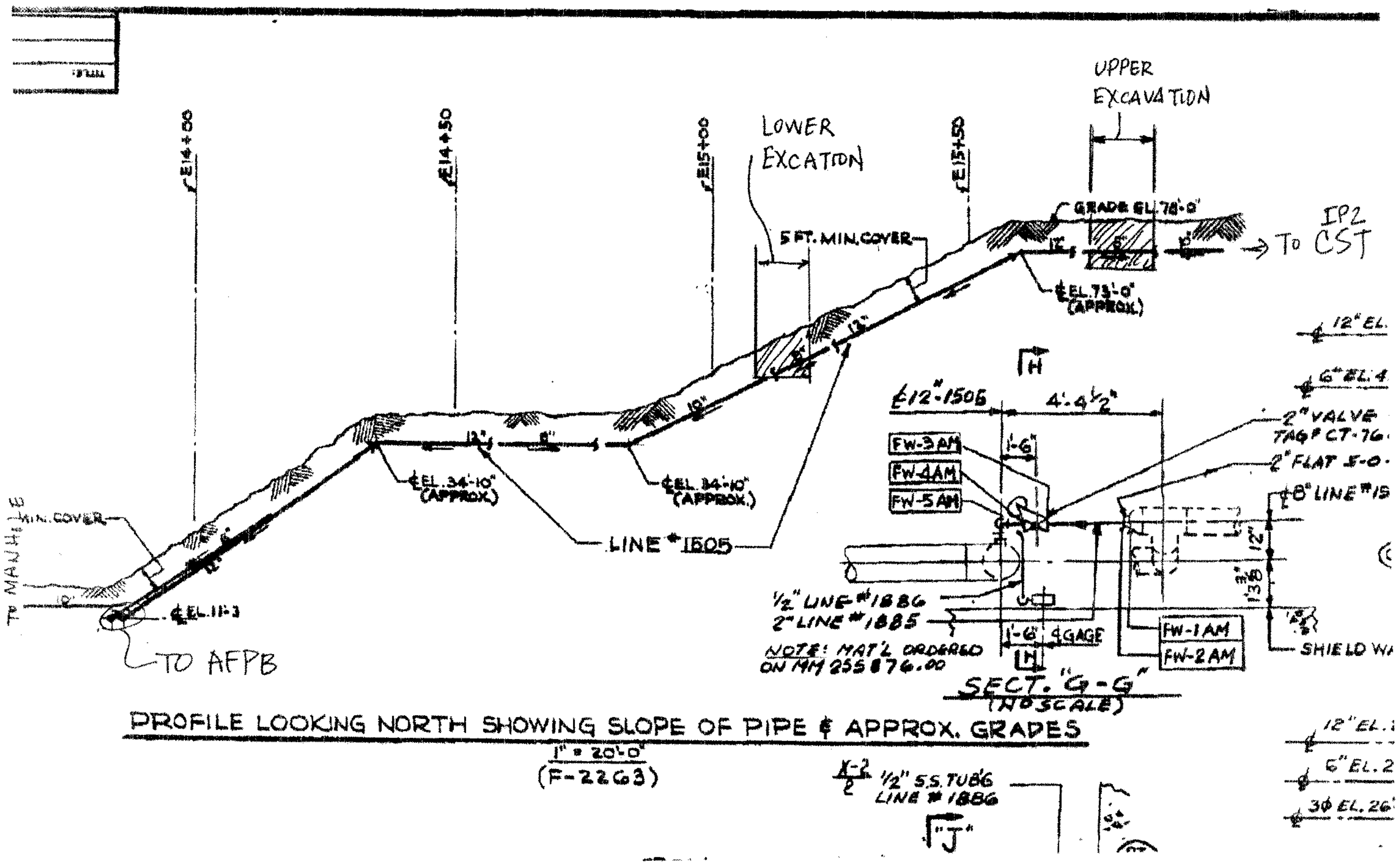
The visual inspection of these pipes at the lower excavation revealed that they were in generally good condition, with the coating intact and in acceptable condition. A minor coating repair was required at one location on 8" Line 1509 and the 10" overflow line required repair at the top portion of the pipe at the crests of the corrugations, possibly indicative of coating damage during the digging. Based on the results of these pipe visual inspections (at the upper and lower holes), and the coating repairs performed, there was no evidence of any significant pipe degradation that would warrant the re-inspection of these pipes at the same locations. Future inspection of these lines will be performed at different location(s) along their length. The scheduling of the future inspections will be controlled under the IPEC Buried Pipe Program. Specifically for the CST lines, CA-5 of CR IP2-2008-04754 reads, "Given the results of the leak in the AFP Building, determine if the scope and/or frequency of future buried condensate lines should be modified. This should cover both IP2 and IP3." See elevation drawing on the next page.

Completed assessments of these lines determined these lines to be of HIGH impact (two lines are safety related), MEDIUM corrosion risk and HIGH inspection priority. The HIGH inspection priority results from the safety function performed by Lines 1505 and 1509. The pipe material, soil resistivity and site condition factors result in these lines being of medium corrosion risk. Accordingly, with the initial inspection of these lines performed in October/November 2008, re-inspection of these lines is required within eight years, or by September 2016.

IPEC00203124

LO-IP3LO-2008-151 CA-17
Attach 2
2/2

LINES INSPECTED
12" LINE 1505
8" LINE 1509
10" OVERFLOW LINE (CORRUGATED METAL PIPE)



The configuration of the underground structures in the area is laid out as follows:

The ABFP Building column wall #22 is a solid concrete wall anchored directly to the bedrock that spans from the east wall to the west wall. The ABFP Building wall begins at approximately the 12' elevation (6' below grade) and is connected to the containment shield wall on the east end and the ABFP shield wall on the west end. The column wall #21 is a solid wall anchored directly to the bedrock. The east wall running north to south does not penetrate below grade. The west wall running north to south does not penetrate below grade but the structure for Manhole #5 is located in this area. There are two concrete slabs under the pipes in this area. One is the pad for the stairs and the other is believed to be related to Manhole #5. They are between 4-8" below the pipe. Based on this, the area can be described as being similar to a "bath tub" that drains slowly.

The slab construction in this area is approximately 6-8" thick and was poured as a monolithic slab on grade with sporadic reinforcement installed. There was one area that had what appeared to be 6 x 6 welded wire mesh. But it was not consistent throughout the slab and was not heavily supported when the slab was originally poured. This arrangement would not be unusual for a walkway design.

Once excavation began, it was apparent that there was significant amount of standing water beneath the slab and the backfill was saturated. The backfill also had significantly reduced in volume and was not supporting the slab in this area. The gap between the slab and top of the backfill was approximately 6" to 10", covering an area approximately 8' x 8'. There also was an area that appeared to be washed out measuring 2' x 2' and greater than 6' deep.

The backfill in the area contained rocks measuring up to 8" and other debris such as several aluminum cans and other debris. The large rocks were found throughout the excavation area and a concentration was found closer to the pipe, especially in the area of the 2' x 2' sinkhole. The debris and rocks would hamper the achievement of proper compaction of the area due to the creation of voids and an increase in the amount of un-compactable material.

The configuration of the underground structures that encompass the area allows some ground water to collect due to run off from the north hill and surrounding area. The elevation of the 8" pipe is estimated to be at or just above the groundwater table area; this is based on the surveys of the installed test wells in the area. Some groundwater infiltration has been seen leaching into the bottom of the excavation site, creating a wet environment around these lines.

The 12" line (#1505) and the 8" line (#1509) are carbon steel, schedule 40. These lines were deemed not to require cathodic protection during original plant design due to favorable soil resistivity and drainage characteristics. As a defense against localized corrosion attack, however, lines 1505 and 1509 are externally coated with coal tar enamel and utilize a coal tar enamel saturated felt overwrap for further protection of the coating.

It is a general coating practice to pull a glass matt into the hot enamel as reinforcement, and the outer side of the coating is saturated asbestos felt. The same corresponding lines at Unit 3 are above ground, insulated and heat traced, except outside the ABFB as described on page 35.

The bituminous coatings, as a class, are the most widely used protective media. These classes include asphalt enamels, the greases or waxes, and other mastics which consist of an asphalt or coal-tar base plus an inert binder. Of the large group of coatings tested under the joint effort of the National Bureau of Standards and the American Petroleum Institute, concluded that asphalts and coal-tar enamels were the best.

IPEC00203126

Event Narrative

Coal-tar coatings have been used for over 100 years to protect ferrous metals against underground corrosion. In 1913, an early form of coal-tar enamel was used in protecting gates, locks and penstocks of the Panama Canal. Examination after 35 years of service showed them to be in perfect condition. Coal-tar pitch is almost completely inert to moisture and soil chemicals. Coal-tar coatings and coal-tar pitch used as pipe coatings and for waterproofing have been dug up after 20 to 50 years of service underground. Coal-tar pitch does not absorb any appreciable water and is not affected to any appreciable extent by soil bacteria. These properties make it eminently more suitable for waterproofing and coating of buried steel pipe lines to protect them from the corrosion action of wet soil. If properly applied, the coating should be able to protect the lines in there currently installed environment and is within the life span of the protective coating.

Flow accelerated corrosion (FAC) was not part of the failure mechanism as described below.

Flow accelerated corrosion of carbon steel in water occurs due to the dissolution of the normally protective magnetic film that forms on the surface. (Mechanical removal, i.e. cavitation-erosion, does not normally occur under FAC conditions.) This corrosion was outside to inside on the pipe, and temperature attributes for FAC are generally between 212 °F and 572 °F.

The leak in the condensate piping was caused by external corrosion. Patterns of corrosion on the piping and observations of the backfill indicate that the corrosion on the pipe likely occurred at localized areas of coating damage that occurred during installation of the pipe. In comparison, other corrosion found on the removed elbow which affected a larger area but it was not as deep is more typical of corrosion related to difficulties in applying a good quality coating on more complex surfaces such as elbows and other fittings. For additional details on the failure analysis, see Structural Integrity Associates (SIA) Report No. 0900235.402.

IPEC00203127

Event Narrative

Conclusions

From the information gathered, the event was caused by the failure of the protective coal-tar epoxy coating that was applied at the time of original construction. Based on historical date, the coating, if properly applied, remains undamaged is sufficient to provide corrosion protection of the pipe. This is based on outside studies and the results of the previous inspection and analysis performed in 2008.

The coating failure was a direct result from the installation and type of backfill.

The eventual location of the "through wall leak" on the straight horizontal pipe at this location was due to a localized coating failure in this area that made it the most susceptible area to degrade once the mechanism for corrosion started. There were other localized areas on the straight pipe section and 90 ° elbow that were in a very advanced state of corrosion, also would have, given more time, would have eventually produced additional leak locations.

The ground water infiltration, soil composition, and the location of the leak at the lowest point of the system were all contributing factors to the leak developing in this area.

IPEC00203128

Root Cause Evaluation

The **Direct Cause (DC)** was a through-wall defect in the CST return line located below grade in the ABF Building. There is evidence that the pipe coating had degraded allowing corrosion to eventually penetrate its way through the pipe wall.

A. <u>ROOT CAUSE(S)</u>

1. **RC_1** - The Root Cause (RC-1) is the installation specification 9321-01-8-4 in effect at the time of plant construction. There is evidence that sections of the pipe coating were damaged by rocks that were present in the backfill for the CST lines. The pipe coating material is fiber-based saturated with coal-tar. The material is then applied to the pipe. Since it is a fiber, the coating is susceptible to damage from the various size rocks found in close proximity to and in some cases, up against the pipes themselves.

   The rocks present in the backfill caused coating degradation in some areas of the pipes, making the pipes susceptible to external corrosion. It is evident that soil conditions influence the corrosion rate on those sections of pipe where there is coating degradation. For example, in the sample inspection holes, some coating degradation was found accompanied by minor surface rust. Ultrasonic Testing (UTs) of these areas found virtually no pipe wall loss. The soil conditions in the sample inspection holes were mostly dry, with minimal ground water present. By contrast, the soil in the failure location was found to be moist, which is consistent with the water table in the area estimated to be at the eight to ten foot elevation. The absence of gravel and sand surrounding the pipe promotes wicking of the ground water through the soil which also contributes to the moist conditions in the area. Therefore, the combination of degraded pipe coating and high water table served to accelerate corrosion of the failed pipe.

IPEC00203129

B. CONTRIBUTING CAUSE(S)

CC_1 – The water table in the area of the leak is between eight to ten feet with the pipe elevation at approximately ten feet. The backfill specification did not specify the use of clean sand and gravel under the pipe that would have limited the wicking of the ground water to the soil surrounding the pipes. This kept the soil in the area moist, and at times wet. These soil conditions would find its way into defects in the coating causing corrosion external to the pipe.

CC_2 – The inspection techniques used to preemptively detect underground pipe through wall leaks was ineffective. Buried Piping and Tank Inspection and Monitoring Program does not identify the low point of a pipe line as a suggested sample test point. The procedure inspection locations are based on risk and impact assessments, ease of access, limitations of inspections and ability to isolate lines.

IPEC00203130

C. ORGANIZATIONAL AND PROGRAMMATIC WEAKNESS EVALUATION:

The team performed an Organization and Programmatic Issues Review in accordance with Attachment 9.5 of EN-LI-118.

1. Organization and Programmatic Issues for Installation Concerns

   OP2J – Is there evidence that personnel exhibited insufficient awareness if the impact of actions on safety and reliability?

   Yes. The drawings and specifications allowed the use of material (already available on site) from blasted areas as fill for this buried pipe.

   OP4A – Is there evidence that there are insufficient details in a procedure to perform the task?

   Yes, at the time of installation, UE&C Specification No. 9321-01-8-4, Placing and Compaction of Backfill, was used as backfill guidance. This spec only stated the following, "Place fill in 12" layers and compact with tamper in small areas or by dozer or trucks in open areas. Top 12" shall be clean and compacted as noted on drawings." Drawing 9321-F-1002 states to "top off with gravel." Drawing 9321-F-1024, Containment Building Backfilling and Grading North and East Side, has a note which reads, "Surface of fill to be random size blasted rock from Unit 3 excavation."

   Presently for Unit 2, Con Edison Specification 02200 governs excavation and backfilling. For Unit 3, today's specification is UE&C Specification 9321-05-8-4, Placing and Compaction of Backfill, which is very similar to the original Unit 2 specification.

   OP5E – Is there evidence of inadequate job skills, work practices or decision making?

   Yes, there could have been the potential for poor job skills and work practices when applying the pipe coating, because the fill used was a contributor to the coating damage that was observed.

   All of the above identified issues occurred over 30 years ago, and there are corrective actions to address them. Present equipment and construction specifications and quality control/assurance review, the Engineering modification process would minimize these occurrences from repeating themselves. Interim corrective actions will be issued with this report to address these concerns.

2. Organization and Programmatic Issues for an Inadequate Buried Pipe Program (EN-DC-343)

   OP4A – Is there evidence that there are insufficient details in a procedure to perform the task?

   Yes, EN-DC-343, Buried Piping and Tank Inspection and Monitoring Program does not identify the low point of a pipe line as a suggested sample test point. The procedure inspection locations are based on risk and impact assessments, ease of access, limitations of inspections and ability to isolate lines.

   A corrective action to address this issue would be for the Entergy Fleet team to assess the addition of this point in the procedure, EN-DC-343.

IPEC00203131

D. Safety Culture Evaluation

The root cause and contributing causes were reviewed against EN-LI-118, Attachment 9.6, Safety Culture Evaluation. It was determined that 12 of the 13 impact areas were not applicable to the causes identified within this root cause analysis. However the Human Performance portion of the Safety Culture was impacted because complete, accurate and up-to-date Design Specifications were not in place during original backfill and supervisory and management oversight of work activities and contractors were not effectively implemented to prevent inappropriate backfill practices.

E. Equipment Failure Evaluation – see Attachment.

IPEC00203132

Generic Implications

Extent of Condition Review

As previously stated in this evaluation, the condition of the CST return line through-wall degradation and eventual leakage, was corrosion of the carbon steel piping material caused by coating imperfections and soil/ground water conditions.

Based on the cause of the corrosion and a review of the IPEC Buried Piping Program, it has been determined that all buried coated carbon steel piping could be susceptible to the same corrosion mechanism since the same materials and construction practices used to install the CST return pipe could have been used in other systems. Although all buried piping could be susceptible to external corrosion, recent inspections and operating experience indicate that piping buried at the lower site elevations could have a higher susceptibility because of the closer proximity to the ground water. This was confirmed by the Fall of 2008 excavations which indicated that piping with areas of degraded coating experienced essentially no degradation other than minor surface corrosion. On the other hand, the auxiliary steam pipe between IP1 and IP3, and the IP2 condensate return lines, experienced significant degradation in areas where the protective coating or insulation was either missing or degraded. In the case of the auxiliary steam piping, the incorrect type of insulation was installed (water retentive vs. water shedding). Both the IP2 CST return line and the auxiliary steam piping were buried under the 15' ground level while the two excavated locations were at the 60'+ elevation.

Unlike IP2, the piping at IP3 from the CST down to the transformer yard is supported above grade, heat traced and insulated.

The impact and risk assessments performed for the Buried Piping Program identified the following systems having buried piping that are deemed high priority for inspection:

IP2	IP3
City Water	City Water
EDG Fuel Oil	EDG Fuel Oil
Service Water	Service Water
CST Piping	CST Piping
	Aux Steam
	Steam Generator Blowdown

IPEC00203133

Extent of Condition Review (continued)

Those systems that are assessed to be medium inspection priority, have been scheduled in a long-term inspection plan, with a delayed first inspection (increased from 5 to 8 years) and longer interval until the second inspection (increased from 8 to 10 years).

Similarly, buried tanks of high inspection priority include the EDG fuel oil storage tanks for both IP2 and IP3. However, these tanks and associated piping are enclosed in concrete vaults and were provided with an engineered backfill and therefore, have reduced exposure to the environmental conditions that are associated with the failed lines and no radiological consequence of failure.

Extent of Cause Review

The root cause of this event is attributed to backfill specification No. 9321-01-8-4 used for the buried CST pipe. The specification did not provide limits regarding the type of fill, including rocks size that could be used. Other backfill specifications in effect at the time of construction were also considered. These include backfill for the circulating water piping and de-icing line and around the containment building. A review of these specifications found them to be adequate for their applications.

Other installation specifications associated with Systems, Structures and Components (SSC) important to safety was also considered for deficiencies. These installation specifications were found to be not applicable based on years of operating experience and the plants surveillance test, predictive and preventive maintenance and corrective action programs. These programs are effective in the prediction and identification of equipment and component problems before they become self revealing.

Backfill specifications do not fall into the same category as the specifications mentioned in the previous paragraph. Inspections of buried components is presently limited through code based piping and tank tests. The IPEC buried piping program will address this issue of underground pipe inspections.

Proposed Corrective Actions (GI1)

As stated above, a number of systems have buried carbon steel piping in locations where the soil conditions could be conducive to external corrosion.

Discussions with buried piping inspection vendors as well as EPRI and other utilities indicated that there are several methods which can be used to assess the condition of buried piping and/or the condition of the protective coating. The three most effective and most widely used methods are discussed below:

1. Guided Wave UT (GWUT) – This approach has been demonstrated by EPRI and by GWUT vendors to be an effective tool to identify areas of concern. For GWUT, an inspection collar is installed in an area of the pipe with known thickness. The GWUT collar then sends torsional and longitudinal sound waves down the pipe to compare the continuous cross sectional area of the pipe relative to the average cross sectional area under the collar.

IPEC00203134

Proposed Corrective Actions (GI1) (continued)

This provides a continuous assessment of the remaining pipe cross sectional area for pipe lengths up to several hundred feet, depending on the number of pipe fittings such as elbows located in the inspected area. In addition to the remaining cross sectional area, the GWUT also assess the uniformity of the cross section. This allows the inspector to determine whether any wall loss is uniform around the entire pipe circumference or whether it is predominantly concentrated at a location around the circumference. This inspection tool has been demonstrated to be effective in confirming the absence of corrosion and locating areas for additional inspection. However, since the GWUT does not provide actual pipe wall thicknesses, it can not be used to perform structural evaluations or assess piping operability.

2. Coating Assessment – This assessment technique uses electrical current to locate coating holidays. This method sends electrical current down the pipe from a given location (usually at the location where the pipe penetrates the ground) and then the inspector uses a special probe to walk the area above the pipe, to locate areas of stray current. The location and magnitude of the stray current areas provides an indication of the location and extent of coating degradation. Similar to the GWUT, this inspection technique is effective in locating areas for further evaluation but does not provide actual pipe wall thickness measurements to support structural evaluations. Therefore these inspection results can not be used to assess piping operability.

3. Direct OD Surface Inspection – This approach is the most effective in assessing the condition of the coating and also provides access to straight beam UT which allows for direct measurement of the remaining pipe wall thickness. However, this approach requires excavation ranging in depth from a few feet up to 20 or 25 feet, and has the potential for causing damage to the pipe and/or pipe coating during the excavation itself. This approach requires extensive resources and can not be used when the outside temperature has the potential to result in freezing. This approach is best used in combination with either GWUT or coating inspections when areas of concern have already been pre screened.

The recommended locations to be inspected are:

1. IP2 8" Condensate Return Line in the excavated area in the FRV Room.
2. IP2 12" Condensate Supply Line in the excavated area in the FRV Room.
3. IP2 24" SW Line 408 in the Transformer Yard outside the PAB where it exits the ground.
4. IP3 12" Condensate Supply Line outside the Auxiliary Feedwater Pump Building where it goes underground.
5. IP3 8" Condensate Return Line outside the Auxiliary Feedwater Pump Building where it exits the ground.
6. IP3 24" Line 408 in the backup pump valve pit.

NOTE: If any of the above area(s) are not accessible, substitute area(s) may be selected by IPEC Engineering.

IPEC00203135

Previous Occurrence Evaluation

Internal

A search of internal operating experience data was performed to determine if the same or similar conditions had previously occurred at IPEC or other Entergy sites. No CR origination date restriction was placed on the search. The search included IP2 and IP3. CR descriptions were searched for the words "buried" or "underground." The searches resulted in 89 hits that were related to CAT "A" or CAT "B" CRs. In addition, 11 CAT "C" hits in HQN, NOE and LAR CRs were reviewed. The causes and corrective actions from pertinent CRs in the search results were considered during this root cause evaluation. Attachment V contains a list of the pertinent Entergy CRs.

A search was also performed for all IPEC CAT "C" CRs that contained the words "buried" or "underground." The search returned 100 hits. The CRs were reviewed and one CR of note was CR IP3-2007-01852. The CR documented a steam leak on an 8" auxiliary steam line. This past event was determined to not be similar in that the issue was the original coating of the steam line being incorrect for the application. See additional information regarding this leak below.

Unit 1 to Unit 3 Aux Steam Buried Pipe Leak – On April 7, 2007, CR IP3-2007-01852 was initiated stating, "There are large underground steam leaks just went and north of the U3 ETA tank moat. Two separate leaks exist, one on the north corner of the moat and the other about 10' west of the moat. The pavement around these leaks is very soft and may impede transformer replacement/work if heavy equipment is needed to travel over this area.

Work Order IP3-07-19295, was written requesting excavation of the material surrounding the 8" Aux Steam line leaks. Further actions shall be taken as a function of the results of the visual inspection of the leak areas. Work Order IP3-07-19911, was written to perform the necessary repair of the steam line.

The 8" Ø Aux Steam line has a minimum of 9" thick gilsotherm insulation over which a 1'6" thick soil cover is provided. The Aux Steam and the 4" Ø Condensate line have special supports which are located every 15'. Details of the supports are as follows:

IPEC00203136

Previous Occurrence Evaluation

External

A search of external operating experience data was performed for this event using the INPO web. The searches were conducted but not limited to SOERs, SERs, SENs, Topical Reports, NRC GLs, NRC INs, NRC Bulletins, Plant Events, LERs, EPIX, NPRDs and vendor notifications. A date restriction was not placed on the searches. Searches consisted of OE containing "buried: and "pipe" of which 247 hits were returned. Twelve pertinent CRs from the OE search were noted for which the information provided was considered in this root cause evaluation. A summary of the pertinent OE is contained in Attachment VI.

IPEC00203137

Safety Significance Evaluation

There is no safety significance to the operating plant as a direct result of the degraded condition on the 8" CST return line based on the following:

1. Overall integrity of the subject line was evaluated under Calculation IP-CALC-09-00032 (EC 13322) to be structurally adequate per ASME CC-N513-2 with the through wall leak and the subject line remained operable.

2. Presence of the through wall leak can drain the 8" Condensate return but it will not siphon the CST. Since the CST overflow line enters/exits the CST at the same elevation as the 8" return line, (i.e. 115'5" pipe centerline (Drawing 9321-F-2264)) and the 8" return line is equipped with a ¾" siphon breaker hole drilled at the top of the pipe inside the tank (9-9237-DWG-19), the volume loss in the CST is effectively limited to the volume of water present in the return and overflow lines. This siphon breaker ensures that the CST water level remains at a minimum of 34.01' from the tank bottom which in turn ensures approximately 645,000 gallons (Graph TC-6, Rev 1 and Calculation FIX-00024) is maintained in the tank.

3. The loss in inventory returned back to the CST, with the AFW pumps in operation re-circulating to the CST through a postulated degradation is estimated to be less than 15 GPM. This estimate is conservative since the increase in pressure at the area from pump operation is expected to be less than 1 psig. (Normal head pressure from the CST is about 40 psig. Estimated differential pressure drop through 300' of 8" schedule 40 pipe at a flow rate of 650 gpm is less than 1 psid from the Appendix B Table B-14 of Crane Technical Paper 410). The increase of 1 psid over the initial 40 psid is about 1% in flow. Based on the pump out rate of approximately 10-12 gpm noted during uncovering of the subject pipe, the estimated increase is expected to be significantly less than 15 gpm stated. Assume a 15 gpm loss of inventory through the breach, the estimated volume loss from the CST for a 24-hour period would be about 21,600 gallons (1.13' in tank level).

4. In support of decay heat removal, Technical Specification (TS) 3.7.6 requires a minimum of CST volume of 360,000 gallons for 24 hours following a trip at 100.6% rate thermal power (RTP). Due to piping degradation, some of the recirculation flow from operating AFW Pump would be lost and additional volume in the CST is required for this for 24 hours. Based on the condition which existed, CST volume would have to be increased by approximately 21,600 gallons to accommodate inventory loss through the breach above the 360,000 gallons resulting in a required volume of 381,600 gallons. Rounding this to 400,000 gallons, it is equivalent to an approximately indicating level of 17'. A review of IP2 CST trend since 1/1/2007 to the present, minimum indicated CST level is above 19'. Additionally, multiple barriers are in place to support CST inventory about the 17' indicating level. These barriers include a low-level alarm at 19.5' and 19.2', and automatic closure of LCV-1158 at 18.21'.

5. There is no significant environmental impact since the leakage is discharged via the site storm drainage system because the CST is already identified in the IPEC SPEDES Permit. Leakage was directed to the nearby storm drainage (e.g. Manhole #5). Environmental Engineering was informed of the condition and has been monitoring these discharges. It was noted that a minute level of Tritium was detected in the samples.

6. There is no industrial impact as a result of the degradation. The leakage was underground below the concrete flooring. Subsequent excavation and repair to the subject pipe was conducted in accordance with the accepted work practice.

7. City water is available as a backup to the CST in the event that the CST level drops below the level required to perform its safety function.

IPEC00203138

Safety Significance Evaluation

In summary, there is no safety significance to the health and safety of the public from nuclear, safety, industrial or environmental associated with the subject event due to the condition of the degraded 8" CST return line. Multiple barriers are in place to insure the minimum required CST inventory is not challenged as a direct result of the piping degradation and any discharge is monitored consistent with the SPEDES Permit.

IPEC00203139

Corrective Action Plan

A. **Immediate Actions**: **{Describe actions performed on discovery and remedial actions which were taken to mitigate the consequences of the event or condition}**

1. Replaced the damaged section of the 8" CST return piping per Work Order 00183296.
2. Released to the industry as OE28335; (Preliminary) Leaking Underground Condensate Return Line Pipe. (IPEC, IP2) Consequently, this will be reviewed by each site as it enters the OE screening process from INPO. (CA-06 of this CR.)

B. **Interim Actions (if required)**: **{Document any interim actions needed to minimize the likelihood of recurrence** WHILE THE LONG-TERM ACTIONS ARE COMPLETED**. Each interim action should only last until a specific long-term action is completed.}**

1. Send out the failed section of pipe for failure analysis. **Assign to P&C Eng, Due Complete**
2. Track failure analysis for the failed section of the pipe and document the results of the testing and analysis. **Assign to P&C Eng, Due 5/21/2009**
3. Discuss this Root Cause Analysis with the ESP population, through ESP Continuing Training "Kick-Off" session. **Assign to P&C Eng, Due 10/15/2009**
4. Review modification and corrective maintenance packages ready for installation that are related to buried piping and backfilling. **Assign to Design Eng, Due 6/25/2009**

IPEC00203140

Corrective Action Plan

<u>Long Term Actions</u>: {DESCRIBE recommended actions to mitigate consequences and prevent recurrence. IDENTIFY which actions are Corrective Actions to Prevent Recurrence (CAPRs) and any which are Long-Term CAs per EN-LI-102.

Identified Causes	Corrective Actions	Resp. Dept.	Due Date
RC_1, CAPR and CC_1.	Update the buried piping backfill and excavation specification for IPEC as a site.	**Design Eng**	**12/17/2009**
CC_2	Implement improved inspection techniques for buried piping.	**P&C Eng**	**9/10/2009**
DC	Send out removed pipe for failure analysis. Track and evaluate results	**P&C Eng**	**5/21/2009**
RC_1	Research the original construction of this buried pipe for any additional backfill guidance that may have been available	**Design Eng**	**9/24/2009**
CC_1	Evaluate the need/feasibility for cathodic protection to be used on selected buried piping. Initiate Engineering changes and present to the URT with results, as necessary.	**P&C Eng**	**12/17/2009**
CC_1	Evaluate the need for a drainage system and monitoring for CST lines, near Manhole #5. Initiate Engineering Changes and present to the URT, as necessary.	**Design Eng**	**12/17/2009**
CC_2	Ensure inspection locations are based on risk. Considering highly moist environments to be included in the procedure. Include Corporate Engineering Programs (CEP) for inspection guidance.	**Eng - HQN**	**6/15/2009**
CC_2	Evaluate the need to add cathodic protection to those areas of buried pipe whose inspections have indicated pipe defects.	**P&C Eng**	**11/15/2009**
EOC	Once additional inspections are complete, initiate additional CAs as required and present the results to CARB.	**P&C Eng**	**9/24/2009**
Other	Evaluate the use of existing monitoring wells for buried pipe and tank leaks as early leak detection. Update monitoring wells testing requirements as necessary.	**Projects**	**7/23/2009**
OE	Issue an internal fleet-learning NOE in accordance with EN-LI-102 Attachment 9.5 to [fleet manager identified by CARB] to evaluate this for the fleet " (Preliminary)	**OE Coordinator**	**Complete**
OE	Issue/revise an internal/external OE to the Industry for this Root Cause Evaluation in accordance with EN-OE-100	**OE Coordinator**	**6/18/2009**

IPEC00203141

Corrective Action Plan

Identified Causes	Corrective Actions	Resp. Dept.	Due Date
EOC	Perform pipe inspection at the location; IP2 8" Condensate Return Line in the excavated area in the FRV Room"	**P&C Eng**	**9/10/2009**
EOC	Perform pipe inspection at the location; IP2 12" Condensate Supply Line in the excavated area in the FRV Room"	**P&C Eng**	**9/10/2009**
EOC	Perform pipe inspection at the location; IP2 24" SW Line 408 in the Transformer Yard outside the PAB where it exits the ground"	**P&C Eng**	**9/10/2009**
EOC	Perform pipe inspection at the location; IP3 12" Condensate Supply Line outside the Auxiliary Feedwater Pump Building where it goes underground.	**P&C Eng**	**9/10/2009**
EOC	Perform pipe inspection at the location; IP3 8" Condensate Return Line outside the Auxiliary Feedwater Pump Building where it exits the ground.	**P&C Eng**	**9/10/2009**
EOC	Perform pipe inspection at the location;IP3 24" Line 408 in the backup pump valve pit	**P&C Eng**	**9/10/2009**
Effectiveness Review	Issue an LOCA to track and document the RCA effectiveness review	**CA&A**	**5/28/2009**

IPEC00203142

Effectiveness Review Plan

Effectiveness reviews are required for all CAPRs (and may also encompass the entire corrective action plan). This section should contain an Effectiveness Review strategy that includes the following:

- *METHOD – describe the method that will be used to verify that the actions taken had the desired outcome.*
- *ATTRIBUTES – Describe the process attributes to be monitored or evaluated.*
- *SUCCESS – Establish the acceptance criteria for the attributes to be monitored or evaluated.*
- *TIMELINESS – Define the optimum time to perform the effectiveness review.}*

THE FOLLOWING DEFINES THE EFFECTIVENESS REVIEW PLAN FOR THE CAPRS IN THIS CORRECTIVE ACTION PLAN:

CAPR		**(State the CAPR(s) here)** 1. Design Engineering to update the buried piping backfill and excavation specification for IPEC as a site.	**Resp. Dept.**	**Due Date**
	Method	1. Document review of the new specification issued for IPEC.	P&C Eng	
	Attributes	1. Verify new specification thoroughly addresses: Details of gravel, sand rock size Layering requirements, dimensions Type of fill	Design Eng	
	Success	1. The details specified in Attributes section have been adhered to.	Design Eng	
	Timeliness	1. Perform a review 3 months after completion of the CAPR (Nine months has been allowed to complete the specification).	P&C Eng	
		See Att. 9.10 in LI-118 (REPEAT SEQUENCE ABOVE FOR EACH CAPR)		

IPEC00203143

References

Documents reviewed:

1. EN-LI-118, Root Cause Analysis Process
2. EN-DC-343, Buried Piping and Tank Inspection and Monitoring Program
3. EN-LI-119, Apparent Cause Evaluation (ACE) Process
4. Corrosion and Cathodic Protection Theory, Bushman and Associates, Inc.
5. Siebert, CA and Bush, SH - Literature Survey on Underground Pipe Lines, Their Corrosion and Protection. Engineering Research Institute, University of Michigan
6. Jonas, O. (PE; PhD) - Water Chemistry and Corrosion Control, Training Course Material
7. LO-IP3LO-2008-00151, CA 19, Attachment 1, IPEC Buried Piping Impact Assessment, Corrosion Risk Ranking and Inspection Prioritization Methodology
8. IP-RPT-09-00011, EC 13500, Corrosion/Cathodic Protection Field Survey of Underground Structures at IPEC during October 2008
9. Watson, TRB - Why Metals Corrode
10. EPRI Report 1016456, Draft 3, September 2008 – Recommendations for an Effective Program to Control the Degradation of Buried Pipe
11. IP Drawing 9321-F-2019 – Flow Diagram Boiler Feedwater
12. IP Drawing 9321-2018 – Flow Diagram Condensate and Boiler Feed Pump Suction
13. IP Drawing 9321-F-1024 – Containment Building Backfilling and Grading North and East Side
14. IP Drawing 9321-F-1209 – Shield Wall Area Concrete Foundation Sections
15. Drawing 9321-F-1002 – Plot Plan – UFSAR Figure No 1.2-3
16. Drawing 9321-F-1208 – Shield Wall Area Concrete Plan Elevation 18'6"
17. Drawing 9321-F-1231 – Shield Wall Elevations and Section – Sheet No 2
18. Drawing 9321-F-2263 – Yard Area – Condensate Storage Tank to Turbine Building Condensate Piping Plan – Sheet No 1
19. Drawing 9321-F-2264 – Yard Area – Condensate Storage Tank to Turbine Building Condensate Piping Plan – Sheet No 2
20. Structural Integrity Associates Inc, Report No. 0900235.401

IPEC00203144

References

Personnel contacted:

1. Greg Bouderau
2. Joe Peterson
3. Joe Ruch
4. Bob Allen
5. Bob Danko – Stone and Webster
6. Rich Meyer Jr – Stone and Webster
7. John Bouse – Stone and Webster
8. Michael O'Brien – Stone and Webster
9. Charles Kiall – Stone and Webster
10. Robert Okuniewski – Stone and Webster
11. Tom Camilliere – Stone and Webster
12. Bernard Barreiro – Stone and Webster
13. John Curry
14. Charlie Jackson
15. Bob Eifler
16. Kai Lo
17. Jan Mayer
18. Kevin Curley
19. Mike Tesoriero
20. Nelson Azevedo
21. Bob Lee
22. Matt Barvenik – GZA Geo Environmental Incorporated

IPEC00203145

References

Analysis Methodologies employed: *{List all analysis methods used}*

1. Why Analysis

2. K-T Method

3. SIA Report "Analysis of 8" Condensate Water Storage Tank Return Line CD-183", Report No. 0900235.402

Attachments: ***in PCRS***

I. Equipment Failure Evaluation

II. K-T Analysis

III. Why Staircase

IV. Operating Experience

IPEC00203146

ATTACHMENT I

CONDITION REPORT: IP2-2009-00666

EQUIPMENT AFFECTED: Condensate Storage Tank 8" Return Line

UNIT: 1 - ☐ 2 - ☒ N/A - ☐	
PROCESS SYSTEM CODE	AFW
COMPONENT CODE	ACCUMU
TAG SUFFIX NAME	HCLM/SR/MR
TAG NAME	CST

I. SCREENING

1. FAILURE SCREENING	YES	NO
Did condition result in the loss of a critical function of the SSC?	☒	☐
Did this condition result in unplanned or emergent maintenance?	☒	☐
Does the condition represent a degraded or non-conforming SSC that was proactively identified but resulted in emergent work as defined in WM-101 (e.g., identified, via performance monitoring, predictive monitoring, surveillance testing, preventive maintenance)?	☐	☒
Did this condition result in maintenance on an SSC that was premature? (A failure before the expected end of life of the component was reached, or a failure due to problems introduced during previous maintenance.)	☒	☐
• **IF** the answer to ALL of the above questions is "NO", **THEN** the condition does not represent a Failure **AND** no further review is necessary. • **IF** the answer to ANY of the above questions is "YES", **THEN** the condition represents a Failure. **CONTINUE** to the next section.		

IPEC00203148

IPEC00203148

IPEC00203149

2. ACCEPTABILITY SCREENING	YES	NO
The failed SSC resulted in an unintended or unexpected operational effect (i.e. high or low critical component failure).	☒	☐
The failure is a Maintenance Rule Functional Failure.	☐	☒
The condition resulted in maintenance on an SSC in a mode other than it would normally be taken out of service in. (Example: Critical equipment degradation during summertime, on-line maintenance required on SSC that is only planned for OOS during an outage.)	☒	☐
Condition resulted in additional unavailability of a safety related SSC.	☒	☐
Condition resulted in a repeat or recurrent problem that creates an operation or maintenance burden.	☐	☒
• **IF** the answer to ALL of the above statements is "NO", **THEN** the Failure is considered "Acceptable" **AND** no further evaluation is necessary. • **IF** the answer to ANY of the above statements is "YES", **THEN** the failure is "Unacceptable". **LIST** the best fit INPO ER PO&C and Failure Mode codes from EN-LI-121 Attachment 9.8 and 9.9 in the "Apparent/Contributing Cause" Section of the ACE (Attachment 9.1 for Higher Tier, or Attachment 9.2 for Lower Tier). **CONTINUE** to the next section.		

II. ACTIONS EVALUATION

Changes Needed To:

YES	NO	EVALUATE	CHANGES NEEDED
☐	☒	PM	
☐	☒	Performance or Condition Monitoring	
☐	☒	Modifications	
☒	☐	Procedures	A corrective action has been assigned to Design Engineering to update the buried piping backfill and excavation specification for IPEC as a site.
☒	☐	Programs	Assure the requirements of EN-DC-343, "Buried Piping and Tanks Inspection and Monitoring Program", are being met; tracked via a corrective action of this CR
☐	☒	Training	
☐	☒	Maintenance Practices	
☐	☒	Spare Parts	

Consider:

YES	NO	EVALUATE	DETAILS
☒	☐	Generic Implications / Extent of Condition / Extent of Cause	See within RCA report
☒	☐	OE required to be issued	Preliminary Report OE 28335 issued.
☒	☐	Cross Site	See within RCA report

Consider:

YES	NO	EVALUATE	DETAILS
		Applicability	
		INPO PO&C CODE:	**EN1.07** – Engineering products, including evaluations that support technical decisions, and design information are accurate and complete and are of high quality. **CM3.07** – Engineering products are developed with appropriate consideration of possible failure modes and effects.
		INPO Failure Mode:	FM08 - Corroded

IPEC00203152

IPEC00203153

CR IP2-2009-00666 KT ANALYSIS
CONCLUSION: Coating Failure Due to inadequate backfill specification

Attachment II

WHAT	IS	IS NOT	DISTINCTIONS	CHANGES	POSSIBLE CAUSES	DOES NOT EXPLAIN	EXPLAINS ONLY IF
	Leak	Not a crack Not failed weld Not a mechanical joint Not a direction change Not at any joint	Underground leak		1. Manufacturing defect 2. Damaged during construction 3. Coating degradation 4. Poor material selection 5. Poor installation practices	1. Color difference at defect area 2. None 3. None 4. Why UTs in other locations found good wall thickness 5. None	1. No color difference and no welder ID stamp 2. Evidence of repair on pipe 3. Only if both coating and pipe had been damaged 4. Damage (leakage, degradation) at locations 5. Defect causes leak 6. If coating has been damaged 7. If in an area of high water table/ heavy floor loading
		Not above ground	Confirmed with walkdown		1. Manufacturing defect 2. Damaged during construction 3. Coating degradation 4. Poor material selection (pipe/coating) 5. Poor installation practices	1. Color difference at defect area 2. None 3. None 4. Why UTs in other locations found good wall thickness 5. None	1. No color difference and no welder ID stamp 2. Evidence of repair on pipe 3. Only if both coating and pipe had been damaged 4. Damage (leakage, degradation) at locations 5. Defect causes leak 6. If coating has been damaged 7. If in an area of high water table/ heavy floor loading
		Not large	No level change seen in CST		1. Early detection 2. Self-revealing in ABF Building floor sleeve 3. Localized failure	1. If failure was not a localized failure 2. Only if coating was damaged	1. Minimized localized small failure 2. If the coating has been damaged 3. If in an area of high water table/ heavy floor loading
		Not all ground water	Sample of water in ground around the pipe showed hydroziene. When the repair was made, the hole was left open and the hole has been filling with water.		1. High water table 2. Leakage from manhole 3. Runoff from North hill	None	1. No other leakage was observed in other excavated areas (test holes)

IPEC00203153

			However, it has not been showing hydroziene.				

IPEC00203154

IPEC00203155

CR IP2-2009-00666 KT ANALYSIS
CONCLUSION: Coating Failure Due to inadequate backfill specification

WHAT	IS	IS NOT	DISTINCTIONS	CHANGES	POSSIBLE CAUSES	DOES NOT EXPLAIN	EXPLAINS ONLY IF
	Small leak	Not multiple leaks Not from the tank Not in both underground lines associated with the tank	Approximately 10 gallons per minute leak rate per calculation based on tank inventory balance		1. Manufacturing defect 2. Damaged during construction 3. Coating degradation 4. Poor material selection (pipe/coating) 5. Poor installation practices	1. Color difference at defect area 2. None 3. None 4. Why UTs in other locations found good wall thickness 5. None	1. No color difference and no welder ID stamp 2. Evidence of repair on pipe 3. Only if both coating and pipe had been damaged 4. Damage (leakage, degradation) at locations 5. Defect causes leak 6. If coating has been damaged 7. If in an area of high water table/ heavy floor loading
	Hole in return pipe Marked Pipe Area around the hole is clean Area around the hole is shiny Pipe was laquer-coated from the vendor	Not an elbow Not at a weld Not in a tee Not in the vertical Plane pipe No rust bloom around the hole Not discolored Was not painted	Leak is in straight run of level pipe It is the lowest level of plane below grade It has the highest potential for exposure to ground water Only one hole in the pipe Stampled with an “s” and “y” Rust bloom evident at other locations of pipe but not at hole No pattern to rust bloom locations Color at hole location is not consistent with color of the rest of the exposed piping (7 ft) Area around pipe shines about 8 inches in length and 6 inches radial; possible previous weld repair		1. Manufacturing defect 2. Damaged during construction 3. Coating degradation 4. Poor material selection (pipe/coating) 5. Poor installation practices	1. Color difference at defect area 2. None 3. None 4. Why UTs in other locations found good wall thickness 5. None	1. No color difference and no welder ID stamp 2. Evidence of repair on pipe 3. Only if both coating and pipe had been damaged 4. Damage (leakage, degradation) at locations 5. Defect causes leak 6. If coating has been damaged 7. If in an area of high water table/ heavy floor loading

IPEC00203155

CR IP2-2009-00666 KT ANALYSIS
CONCLUSION: Coating Failure Due to inadequate backfill specification

WHERE	IS	IS NOT	DISTINCTIONS	CHANGES	POSSIBLE CAUSES	DOES NOT EXPLAIN	EXPLAINS ONLY IF
	U2 Aux Feed Building under slab Water table is at or just slightly below the predicted water table.	Not in U3 Aux Feed Building under slab	No rebar in slab Slab had non-uniform re-enforcing wire mesh Slab does not appear in the Civil Drawing Per Engineering, non-load bearing slab Layout of the footing and foundation walls for the area form a "bath tub" effect Backfill specification for light loads. Backfill in area was not free of debris		1. Manufacturing defect 2. Damaged during construction 3. Coating degradation 4. Poor material selection (pipe/coating) 5. Poor installation practices	1. Color difference at defect area 2. None 3. None 4. Why UTs in other locations found good wall thickness 5. None	1. No color difference and no welder ID stamp 2. Evidence of repair on pipe 3. Only if both coating and pipe had been damaged 4. Damage (leakage, degradation) at locations 5. Defect causes leak 6. If coating has been damaged 7. If in an area of high water table/ heavy floor loading
	Area of leak was not coated Is only area without coating	Missing coating in the area of the leak Not miss coating in multiple exposed locations	Pipe was not protected with cathodic protection (by design)		Poor design	If other sections of pipe had same issues and leaks	Only if there was leakage at other locations that were previously excavated (test holes)
WHEN	Unknown	Before 2/14/09	No heavy rain Was heavy snow melt				
EXTENT	Only one location for leak found in exposed pipe	Not in multiple locations					
	Only found on 1 or 2 underground pipes	Coating not degraded in non-leaking line Deviations are decreasing					

IPEC00203156

CR IP2-2009-00666 KT ANALYSIS
CONCLUSION: Coating Failure Due to inadequate backfill specification

EXTENT	IS	IS NOT	DISTINCTIONS	CHANGES	POSSIBLE CAUSES	DOES NOT EXPLAIN	EXPLAINS ONLY IF
3 months ago, 2 holes were dug to expose the same piping for ISE	Pipe was solid	No leaks identified	Coating degradation was found and some surface rust Coating was only missing small area on the upper pipe surface UT showed no significant wall loss; 360 degree exam		No manufacturer defects No damage during construction Proper installation	No issue No issue Some areas of pipe have coating holidays	**Backfill specification did not specify grain size allowing larger rocks to be present around buried pipe**
Recommend ations			Some areas of coating were missing. Exposed pipe for the UT did not have rust bloom Surface was discolored with uniform of Backfill in area was not free of debris (6 inch x 6 inch)		No degradation to coating due to not being in high water table area If backfill was specified	Backfill installation specified engineered fill	

IPEC00203157

ATTACHMENT III

WHY STAIRCASE

PROBLEM STATEMENT: Leak in the CST Return Line placed IPEC Unit 2 in a 7-Day Shutdown AOT

Hole in the CST Return Line.

↓

Pipe had thru wall corrosion.

↓

Protective coating on carbon steel Pipe breached creating susceptibility susceptible to corrosion.

↓

Blast Rock from IP3 was allowed as back fill

↓

Backfill specification doesn't prescribe the grain size for fill.

IPEC00203158

IPEC00203158

IPEC00203159

ATTACHMENT IV – PERTINENT OE FROM EXTERNAL SEARCH

OE Number	Summary Description	Cause(s)
SER 4-81 / Oyster Creek / 1981	Radioactive release due to galvanic corrosion of underground piping	Piping leaks were caused by galvanic corrosion stemming from dissimilar metals buried alongside one another.
OE7067 / Dresden / 1994	Underground Pipes and Storage Tanks: Loss of Effective Cathodic Protection	(1) the cathodic protection system was inoperable or ineffective for several years. (2) original pipe wrapping was breached on some underground pipes, possibly the result of previous repair efforts. These combined factors led to localized corrosion and pitting of pipes.
OE12698/ Seabrook /Nov'2000	Auxiliary Boiler Fuel Oil Supply Line Leak	The bituminous wrapping in a single location on the Auxiliary Boiler fuel oil supply line had been damaged allowing galvanic corrosion to cause a pin hole leak. Pipe was installed for 20 years. The line was located under a paved road. Significant qualities of chlorine were present in the soil.
OE16189 / Brunswick / 2003	Underground Fuel Oil Line Leak	A pressure boundary failure of the buried fuel oil piping due to external corrosion. Contributing to this were; incorrect material application for direct burial, and not including fuel oil piping in the original scope of underground piping investigations.
OE18596 / Surry / 2004	Auxiliary feed water pump recirculation pipe failure	General corrosion due to extended exposure to groundwater. The pipe was wrapped with a single layer of 2 inch wide black plastic tape which failed to prevent groundwater contact. Buried pipe installation specifications require that all buried pipes are coated with a system of hot tar and coal tar impregnated felt.
NUREG - 6876	Risk-Informed Assessment of Degraded Buried Piping Systems in Nuclear Power Plants	-
OED Aug' 2005	Cathodic Protection on Underground Piping	-
NUREG-1801	Generic Aging Lessons Learned (GALL) Report	-
IN06-13	Ground-Water Contamination Due To Undetected Leakage Of Radioactive Water	In August 2004, Dresden identified contaminated ground water in onsite monitoring wells resulting from a leaking underground pipe connected to the condensate storage tanks.

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OE Number	Summary Description	Cause(s)
SER 7-06 / WANO / 2006	Degradation of Essential Service Water Piping	Coating flaws or deterioration often cause localized pipe corrosion resulting in system leaks. Piping integrity is also affected by environmental conditions such as the surrounding soil or trench fill materials. Over time, soil and fill material may shift or settle, increasing the external stresses on buried piping and contributing to piping cracks and failures. An environment with a high moisture content, high electrical conductivity, high acidity and high dissolved salts dramatically increases the potential for pipe corrosion.
OED 2007-09	External Degradation of Buried Piping	-
OE27146 / Quad Cities / 2008	Underground Piping Leak due to Possible Crevice Corrosion	The likely cause of the pitting is crevice corrosion. Stainless steel develops a corrosion-resisting (passive) surface layer when exposed to oxygen. Foreign material had been mingled with the sand fill in an excavation performed about 15 years ago

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ATTACHMENT IV – PERTINENT CONDITION REPORTS FROM INTERNAL OE SEARCH

CR Number	Origination Date/Sig.	Summary of CR Description	Causes
PLP-2004-07471	11/5/2003 / CAT B	Review of site performance in accordance with SOER 02-04 has identified that Underground Piping Health and Long Term Performance requires follow-up.	Underground piping health has been neglected due to lack of a formal program and lack of ownership. Contributing factors are the expense of inspection and basic understanding for the need of cathodic protection.
CNS-2004-05914	8/17/2004 / CAT B	A small section of the underground DG fuel line has had the protective wrap damaged and was not in place at the time of inspection. As a result, the piping in this area has undergone oxidation/reduction of the piping and is quite notable corroded.	Coating was damaged during original construction due to the pipe external surface being impacted by a foreign object.
PLP-2005-01224	2/24/2005 / CAT B	Discrepancies existed in the implementation of required inspection activities associated with buried piping	Since the ASME code subsection IWA-5244 requirements did not change during update in 1995, there was no reason to apply increased emphasis in this area of the program. The site has not documented their determination on the type of underground piping systems currently installed at Palisades and is therefore uncertain of the testing requirements. The plant was originally designed without Inservice Inspection requirements for class 2 and 3 system; therefore, the underground piping was not designed for examination.
ANO-1-2005-01282	9/6/2005 / CAT B	During System Engineering walk down of buried Service Water piping found excessive moisture in the ground cover.	Elevated soil moisture content due to the ground covering materials utilized in the area
NOE-2005-01004	11/21/2005	INPO-DIGEST-0805, Cathodic Protection on Underground Piping	
PNP-2007-00021	1/3/2007 / CAT B	INPO 2006 AFI (ER.3-1) Pipe degradation rates are not monitored for some important underground piping systems including diesel fuel transfer, fire protection, and standby gas treatment systems. In addition, some of the cathodic protection system for diesel fuel transfer system piping has been inoperable for extended periods of time.	1. An underground pipe monitoring program was not developed as part of the plant design basis. Since then no monitoring program has been developed because the plant experience to date with underground piping performance has been good. 2. When the cathodic protection system was installed it was seen as secondary protection because the fuel pipe had previously been wrapped in a protective tape before the impressed current system was installed.

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CR Number	Origination Date/Sig.	Summary of CR Description	Causes
PLP-2007-00376	1/25/2007 / CAT B	An apparent trend has developed in the occurrence of leaks in service water system piping. Program Engineering is developing plans and programs associated with buried piping in support of license renewal. These programs should address some areas.	Service water and fire protection piping component leaks are a result of these systems being over 35 years old and made of carbon steel which is susceptible to damage mechanisms from Microbiologically Influenced Corrosion (MIC) pitting, cavitation pitting and thinning from sand/silt erosion/corrosion.
VTY-2007-00412	2/7/2007 / CAT B	During the Region 1 Inspection of the license Renewable project, the SEP-PT-001 program position for testing of buried Service Water piping in accordance with ASME Section XI -1998 Edition with 2000 Addenda, Article IWA-5244 was questioned. Further review of the code determined that the requirement of the article was mis-understood. Therefore, the piping system was tested using an unapproved alternate test method.	The correct application of the ASME Code should have been a literal reading of the requirement: that VY system is "isolable by means of valves", but was incapable of conducting a "test that determines the rate of pressure loss". Since compliance with the ASME Code was not practicable, VY should have requested the use of an alternate test method by relief request.
HQN-2007-00923	11/6/2007 / CAT C	GGNS INPO 2007 E&A - Site CR 2007-4941 - Area for Improvement (ER.3-1) Current methods to monitor and protect underground piping are not sufficient to prevent unexpected failures. Limited visual inspections of outer diameter piping coatings, coupled with inoperable cathodic protection, leave important buried steel piping vulnerable to corrosion and failure.	

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CR Number	Origination Date/Sig.	Summary of CR Description	Causes
HQN-2007-00923	6/18/2008 / CAT C	This is a fleet learning CR related to Palisades INPO AFI: (ER.3.2) Buried piping and components are not monitored effectively for degradation from both internal and external degradation processes. The cathodic protection system is not tested and maintained to ensure that buried piping is protected if pipe coating degrade. CR PLP-2008-2709 was assigned to the Engineering Programs Manager to evaluate this issue. Details of the AFI are available through Palisades Peer contacts.	
PLP-2009-00219	1/21/2009 / CAT B	An underground fire main break occurred in the Northwest yard. The underground leak is currently under repair and the cause is being investigated by a contractor with expertise in failure analysis.	Indetermined, the most likely case of failure was a combination of localized corrosion, possible pipe settlement due to subsequent underground work in the area (duct banks) or soil movement due to temperature changes and mechanical loading from past crane lifts in the area.

IPEC00203163

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May 15, 2009

Mr. Robert Altadonna
Indian Point Energy Center
295 Broadway
PO Box 308
Buchanan, NY 10511-0308

Project:. 0900235.00
Report: 0900235.402 R0

Subject: **Analysis of 8" Condensate Water Storage Tank Return Line CD-183**
Final report

Dear Robert:

The report of our failure analysis of the leaking condensate piping is attached for your review. This final version contains no changes to Draft B, (other than the date of distribution and an updated report number) which you have reviewed and approved. Please contact me if you have any technical questions about this report, or Ken Rach for questions regarding any administrative issues about this project.

Best Regards,

William E Amend

Associate

IPEC00203164

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Project 0900235.00
Report No. 0900235.402
May 15, 2009

ANALYSIS OF 8" CONDENSATE RETURN LINE FAILURE

Prepared For:

Entergy, Indian Point Nuclear Station

Prepared By:

Structural Integrity Associates, Inc.
Cerritos, California

Prepared By: ____________________ Date: May 8, 2009
Bill Amend, P.E.
Associate

Reviewed By: : ____________________ Date: May 11, 2009
George Licina
Chief Materials Consultant

Approved By: ____________________ Date: May 15, 2009
Ken Rach
Associate

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REVISION CONTROL SHEET

Document Number:	0900235.402
Title:	**Analysis Of 8"Condensate Return Line Failure**
Client:	Entergy– Indian Point Nuclear Station
SI Project Number:	0900235.00

Section	Pages	Revision	Date	Comments
All	All	Draft A	4/9/09	Initial Draft for Review
All	All	Draft B	5/8/09	Second draft for Review
All	All	Final	5/15/09	No changes to draft B

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FIGURES

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TABLES

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ANALYSIS OF 8" CONDENSATE RETURN LINE FAILURE

Executive Summary

The leak in the steel condensate piping was caused by external corrosion. Patterns of corrosion on the piping and observations of the backfill indicate that the corrosion on the pipe occurred at localized areas of coating damage that most likely occurred during installation of the pipe or during installation of the fill. The corrosion on the elbow is more widespread than on the straight section of pipe and is typical of corrosion related to difficulties in applying a good quality wrap coating on a more difficult or irregular shape. It is likely that similar corrosion exists on adjacent piping if exposed to comparable soil conditions. The piping was not cathodically protected.

Corrosion on the inside surfaces was superficial.

No evidence of cracking was observed.

The metallurgical characteristics of the pipe and elbow were normal and the workmanship of the girth weld was good. Where corrosion pitting was present on the weld, the weld metal appeared to be more resistant to corrosion than the adjacent heat affected zone or base metal.

The analysis results did not definitively determine the mechanism of the external corrosion. Features of the corrosion (morphology and corrosion products) support a determination that the corrosion is either the result of exposure to a specific range of ground water characteristics, and/or to microbiologically influenced corrosion (MIC). The corrosion was not consistent with the characteristics of stray current corrosion, even though stray current was previously identified on other buried pipe at the plant.

XRD (x-ray diffraction analysis) showed that the ID corrosion products were generally iron oxides and hydroxides. The OD corrosion product was primarily siderite, an iron carbonate. The difference in corrosion products on the ID and OD indicate that the corrosion on the two surfaces is unrelated.

Recommendations related to selection of locations for further inspection, corrosion monitoring, and soil sampling are included.

Introduction

Indian Point Generating Station Unit 2 (Indian Point) experienced a leak on 8 inch buried piping identified as Condensate Storage Tank Return Line CD-183. The circumstances regarding the discovery of the leak are described in the narrative by Engineering staff in Appendix A. SI performed a long range guided wave (G-Scan™) inspection on February 17th, 2009. to screen several pre-selected sections of pipe for wall loss[1]. The inspection was performed while the

[1]Bass, A., " G-Scan™ Assessment of 8" Condensate Water Storage Tank Return Line CD-183, Inspection Date: February 17th, 2009",SI report no. 0900235.401.R0, March 13, 2009.

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plant was in operation and water was flowing through the pipes. After identifying the leak location and adjacent areas of significant wall loss, Indian Point excavated the area and in accordance with their Technical Specifications replaced the leaking section of the piping..

As described in SI proposal 0900308.00 Rev. 1 of March 20, 2009, the objective of this analysis was to determine the probable failure mechanism and describe the overall condition of the pipe sample. Background information pertaining to the condensate piping is described in the next section. The piping sample was received by SI on March 23, 2009 after removal of the potentially hazardous external coating and related decontamination by Entergy.

Background Information

The following information was provided to SI by the staff of Entergy in response to our request for pertinent background information.

Table 1 –Background Information

Item	Inquiry	Response
1	Applicable design standard(s) for this piping (list applicable industry standard and company standards, particularly if company standards impose additional restrictions related to materials, construction, testing, or inspection) Copies of company or A-E specs	Construction code is B31.1 1955. Design piping specification- 9321-01-248-18 Class C-1. Lacquer coating by spool fabricator (dwg 17D523) All underground piping to be field coated and wrapped in accordance with AWWA spec C-203. Specification imposes no additional restrictions.
2	Installation year	Piping installed in late 1960's
3	Expected life or design life of this piping	Design life of pipe is not specified or known. Design life of plant is 40 years.
4	Expected life limited by what? (external corrosion following coating degradation, internal corrosion, fatigue, no longer needed, etc.)	Pipe life limitation appears to be based upon life of external coating. Based upon visual results, Entergy staff noted that the areas of pipe where coating was intact appears like new and has no external corrosion. Internal corrosion appears minor.
5	Specified wall thickness	Specified wall thickness- 0.322" (nominal wall thickness for 8"SCH40 pipe)
6	Minimum design thickness	Min design thickness- 0.064" per calculation IP-CALC-09-00035
7	Specified diameter	Pipe diameter-8"
8	Specified grade (pipe and elbow)	Pipe- A106 Gr B, Elbow- A234 WCB
9	Design pressure	665 PSIG
10	Normal operating pressure (including ranges)	Static head- approximately 45 PSIG at leak location

11	Original test pressure	Original test pressure unknown. Spool fabrication drawing does not specify a test pressure. After installation, one end is open to atmospheric tank. Not known if B31.1 hydrostatic test was performed.
12	Periodic test pressure (if any) and date of last test	Static head- Last test date unknown- Pressure drop test once every 3 years. Ref 2PT-3Y7
13	Description of the fluid on ID	Clean condensate
14	Operating temperature	90 to 115°F
15	Operating conditions consistent?	Continuous flow
16	Original construction inspection (radiography?, visual? UT?, other?)	Visual inspection of welds
17	Any other periodic inspection, monitoring, or testing	Pressure drop test once every 3 years. Ref 2PT-3Y7
18	Approximate depth of burial	Seven feet at leak location from top of building concrete floor slab
19	Specified backfill (description of what the pipe was supposed to be buried in)	Per specification 9321-01-8-4. This specification does not describe requirements for backfill materials below two feet below grade
20	Observed condition of backfill (as expected per item #19, wet, dry, contaminated by construction debris, rocky, gravelly, sandy, clay, other?)	See interview reports in Appendix A.
21	Measured soil resistivity	No soil resistivity measurements available for the location of the leak. Soil resistivity measurements for soil around this pipe approximately 100 feet and 200 feet from the leak location are described in Background Reference #7 and range from 8000 ohm-cm to 63,000 ohm-cm depending upon location and depth.
22	Any other soil analysis results available?	See 21 above and Background References #8 and #9.
23	Specified external coating (thickness, type, manufacturer, inspection or QA methods used during construction and installation) (refer also to item #1)	External coatings per specification AWWA C-203 "Coal-Tar Protective Coatings And Linings For Steel Water Pipelines - Enamel And Tape - Hot Applied"
24	Coating on welds same as coating on pipe?	The same coating was used on pipe and on welds.
25	Observed condition of coating upon excavation (mechanically damaged, disbonded, water under coating, obvious degradation, etc.)	See interview reports in Appendix A

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26	Electrically continuous with different alloys? If so, what alloys and how far away.	No other buried alloys as part of this condensate piping. The copper grounding grid is believed to be electrically continuous with this piping
27	Cathodic protection installed? If so, describe system type (impressed current, galvanic) and history of potentials, CP maintenance, or operational history	No cathodic protection installed on this system. CP is installed on some other underground systems as described in Background Reference #7
30	Any potential source of electrical interference or history of lightning strikes or ground faults or source of electrical current pick-up and discharge from this pipe?	No known electrical interference, lightening strikes, etc. on this piping. Background Reference #7 does describe interference on another piping system related to a crossing foreign line that is cathodically protected
29	Free corrosion potential (potential of unprotected steel in the same backfill vs. Cu-CuSO4 reference electrode)	Potential measurements are listed in Background reference #7. The measurements range from -248 mV to -328 mV (some possible minor effects of active CP elsewhere in the plant, although this pipe was not cathodically protected)
31	History of significant external corrosion on adjacent piping, if so, describe pipe, service conditions, and approx. date of discovery	No corrosion history on adjacent 12" pipe (same fluid & design). The adjacent 12" line is coated the same as the failed pipe and carrying the same fluid. A 10" CMP drain line is approximately 12 feet from the failed piping at the leak location. The drain line is coated with the same coating as the failed pipe.
32	Any new pipe installations in this line or near by	No new pipe installations
33	Any photographic information from the leak location.	See Figures 1-3 of this report

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Table 2 - Other Background Reference Materials Provided by Entergy Staff for Review

1	UT survey results for the 8" CST pipe, "UT Erosion/Corrosion Examination" report IP2-UT-09-010
2	Relicensing Ground Water Samples. Xls
3	Relicensing Sample Locations.doc (Monitoring Well locations)
4	Attachment 1 IP2 FSAR CP Discussion: This documents the original plant design information concerning underground piping, cathodic protection and soil resistivity.
5	Attachment 2 CST Lines.pdf: This shows the locations of the excavations performed on this line in 2008. This is an elevation view. The leak was at the very bottom left and the 1st excavation is off the page at the top right.
6	Attachment 3 Condition Report : This is a report on the condition of the coating and pipe in the first excavation.
7	Attachment 4 "Corrosion/Cathodic Protection Field Survey and Assessment of Underground Structures at Indian Point Energy Center Unit Nos. 2 and 3 during October 2008" prepared by PCA Engineering, revised December 2 2008?.
8	Attachment 5 GEL Labs 11-07-08 Soil Sample Package for Engineerng.pdf: This is the report of the soil evaluation performed for the two 2008 excavations. They are labeled U2-CST-1 through 4.
9	Attachment 6 02-20-09 Soil Sample Results Package.pdf(2) : This is the soil analysis from the leak location taken 2-20-2009.
10	"Specification for Placing & Compaction of Backfill", Spec. No. 9321-01-8-4, April 10, 1967, by United Engineers & Constructors, Inc. for Westinghouse Electric Corporation for Indian Point Generating Station – Unit No. 2
11	Page 14 of specification for piping materials, Specification No. 9321-01-248-18 Part A, July 29, 1966, Revision 6A, September 1, 1990.

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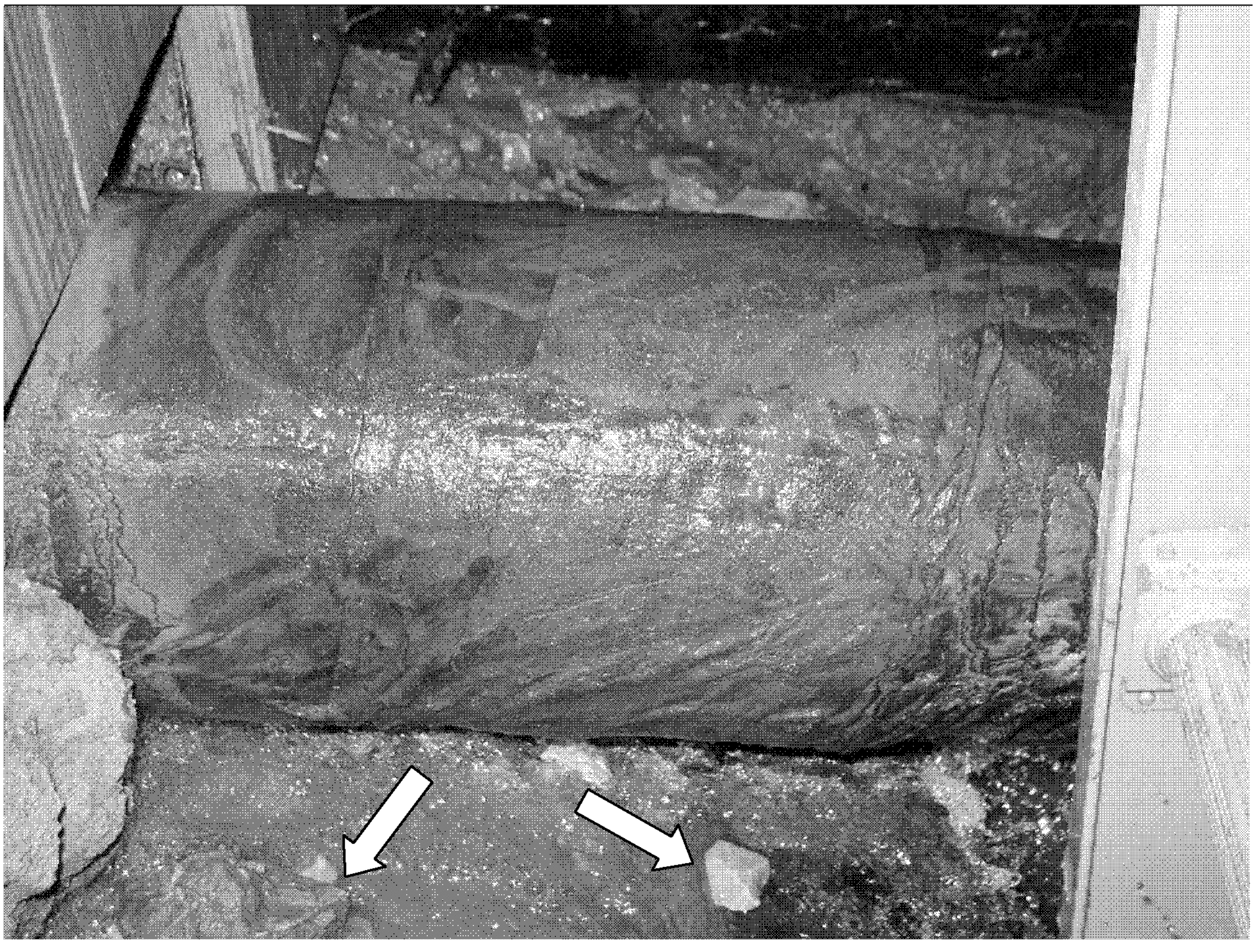

Figure 1- View of pipe coating as observed in the excavation by Entergy Staff
This photograph was provided to SI by Entergy staff. It was taken before the pipe sample was removed. Note wrinkling of the coating typical of soil stress. (Soil stress refers to distortion of external pipe coatings of this type. The distortion is typically caused by relative movement of the pipe and soil resulting from pipe expansion and contraction, soil settlement, or other events.) Arrows point to examples of angular rocks in the backfill.

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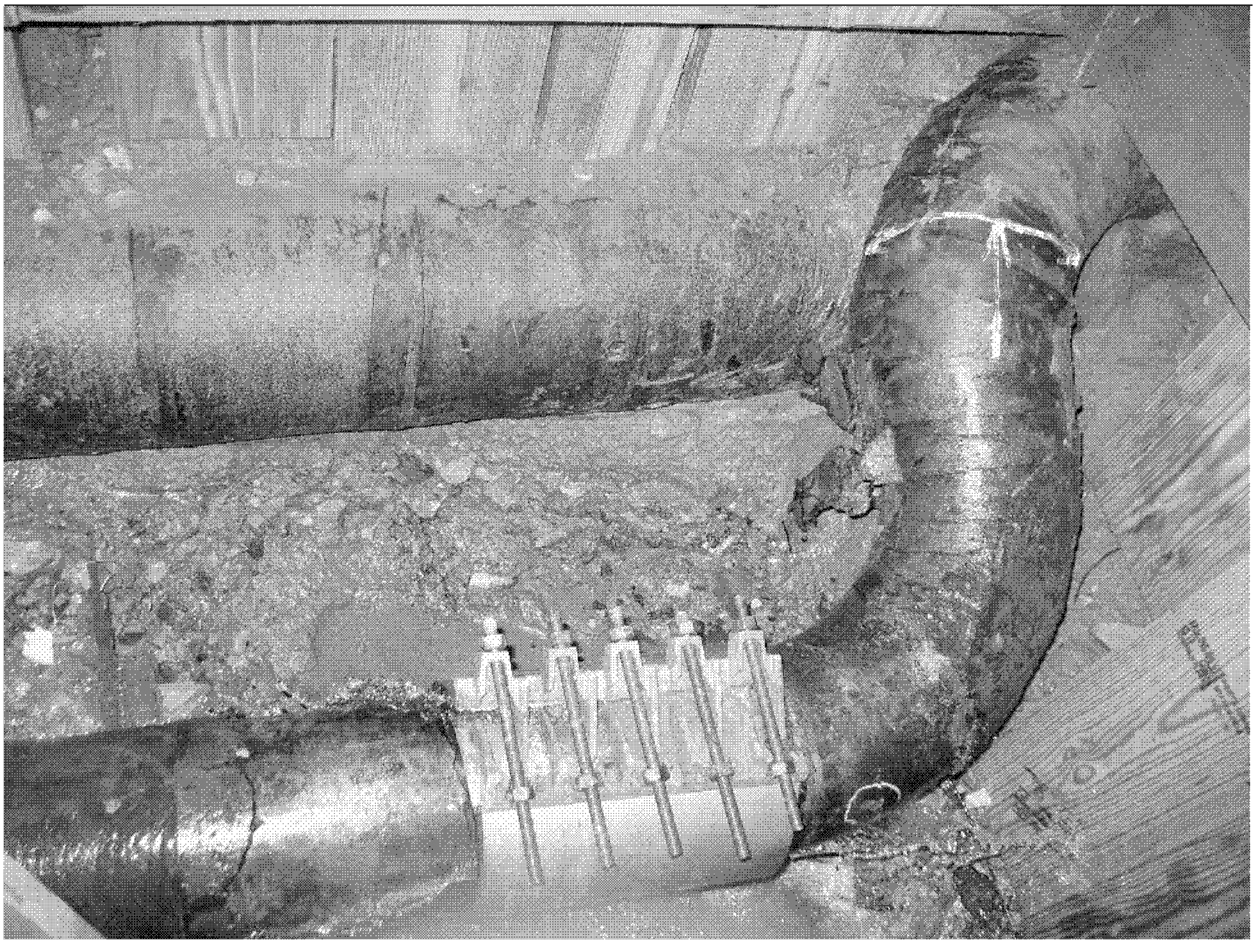

Figure 2 - Photograph of pipe in the excavation before removal of the pipe sample.
This photograph was provided to SI by Entergy staff. A leak clamp has been applied to the area of the leak. The white arrow and lines at upper right indicate the limits of coating that was to be removed during the process of replacing the segment of leaking pipe. See next figure for detail of rocks in the backfill to the upper left of the clamp.

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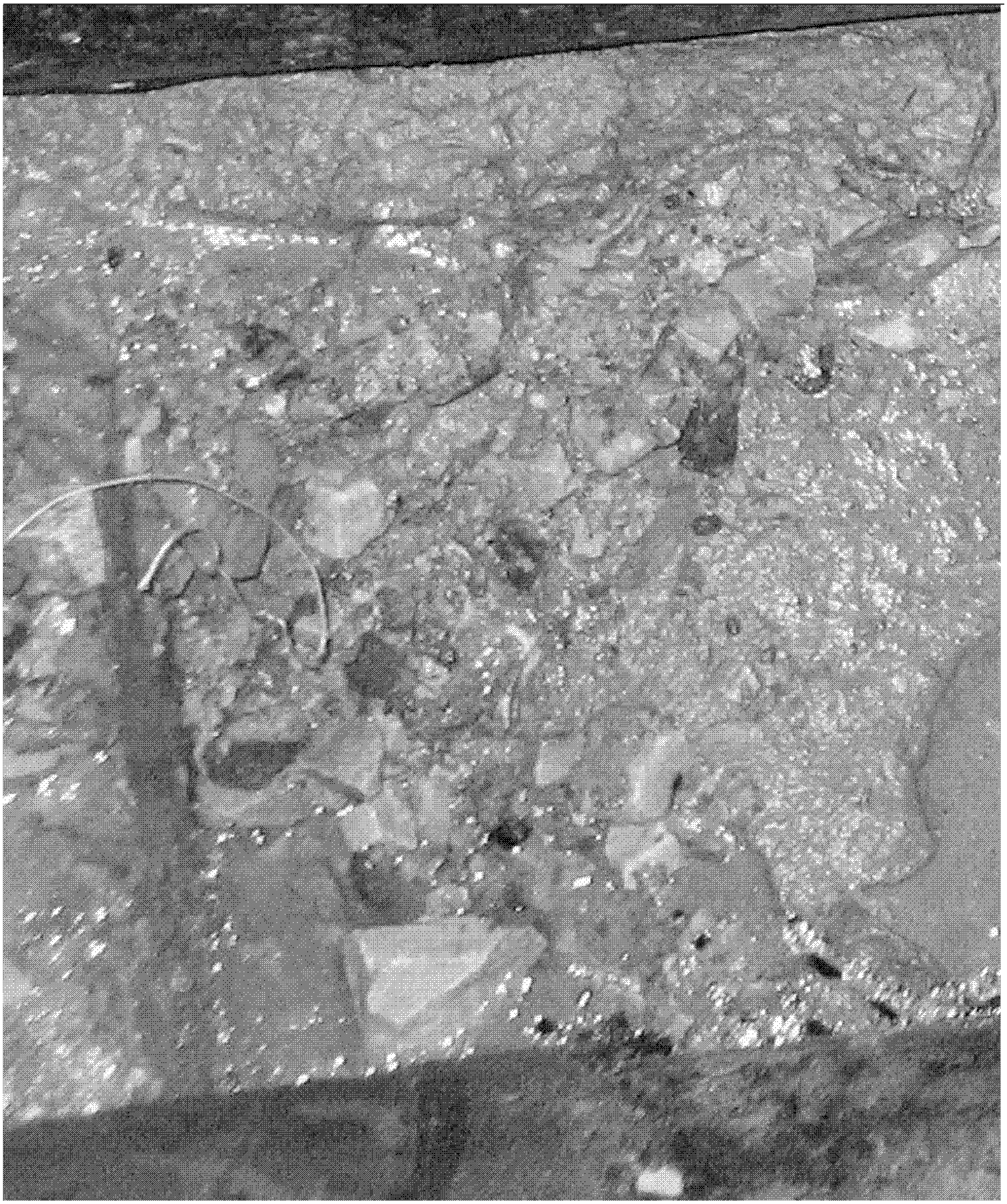

Figure 3 - Detail of previous figure showing angular rocks in the backfill.

Analysis and Results

The analysis tasks included the following:

- Detailed receipt inspection of the sample
- Detailed visual inspection of the outside diameter (OD) of the pipe for cracks, mechanical damage, thinning, corrosion product, etc.
- Visual examination of the inside surface of the pipe for evidence of features that might have influenced the failure
- Dimensional characterization from the OD
- Detailed corrosion mapping
- Metallography to determine the general microstructure and correlation between failure location and microstructure, proper microstructure, any anomalies
- EDS (energy dispersive spectroscopy) and XRD (x-ray diffraction) of corrosion products
- Bulk steel composition
- Tensile Properties of pipe and elbow

The significant findings are summarized below. Details of the results and relevant comments are included in the figures and tables that follow.

Visual Examination: The external coating had been removed and the external surfaces wire brushed and washed by site personnel prior to shipping. As a result, no soil or external coating was present when we received the sample. Some external corrosion product may have been removed by the washing process. The as-received condition of the pipe is illustrated in Figures 4 through 9. Segments removed for further analysis are illustrated in Figure 10. Photographs of manufacturer's markings are illustrated in Figures 11 through 14.

External corrosion on the straight pipe generally consisted of deep isolated pits surrounded by surfaces that were completely uncorroded. The pattern of corrosion was consistent with isolated breaks in the coating. The observed corrosion is mapped in Figure 15. Photographs illustrating representative areas of the corrosion are included in Figures 16 though 32.

The external corrosion on the elbow was more widespread and included relatively large areas of more generalized corrosion. This corrosion pattern was more characteristic of less effective performance of the external coating, perhaps as a result of the difficulty in producing a good wrap pattern when coating irregular shapes such as elbows and other fittings.

In both the elbow and the pipe the morphology of the metal loss included features often associated with MIC including tunneling, striations, overlapping cup-shaped pits, and steep sided pits that sometimes had metal loss that undercut the surface of the pipe. However, similar corrosion patterns can also be produced by abiotic corrosion mechanisms.

The internal corrosion consisted of very shallow scattered pits in the elbow and more widespread, generalized corrosion in the pipe. The appearance of the corrosion is illustrated in Figures 33 through 37. Nothing observed on the inside surface of the pipe would have contributed to this leak.

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The girth weld appeared to be of good workmanship with no significant visible flaws from anything other than corrosion.

Ultrasonic Thickness Surveys and Corrosion Mapping: Ultrasonic thickness data provided by Entergy were spot checked and then supplemented with additional measurements. The supplemental measurements were located around the circumference of the sample at four locations, including near the end of the pipe, the end of the elbow, and on each side of the girth weld. No unexpected results were obtained and the SI data were similar to measurements made by Entergy staff at the corresponding locations.

Visible areas of external corrosion were measured to record the maximum axial length and circumferential width and maximum depth of each area. On the straight pipe, the measurements were made using a digital pit depth gage with a resolution of 0.0005 inches. On the elbow where the pit depth gage and bridging bar could not be used, the pit profile was replicated using a contour gage and the contour was traced. The depth of the pit as indicated by the trace was measured using a magnifying glass and a machinist's scale with a resolution of 0.01 inches. Prior comparisons of this method with a conventional pit depth gage show that the contour gage measurements are typically accurate to about 0.010 inches.

Corrosion Product Analysis: The corrosion product on the external surface was relatively soft and friable and was generally nonmagnetic or very weakly ferromagnetic. The corrosion products did not extend above the surface of the pipe, but pits were either completely or partially filled with corrosion product in most cases. Analysis by XRD showed that the external corrosion products consisted primarily of iron carbonate (siderite). EDS showed the presence of very little chloride and only small amounts of sulfur.

The corrosion product on the inside was very hard, tightly adherent, and strongly attracted to a magnet. The corrosion products resulted in distinct raised bumps above each small pit. Analysis by XRD showed that the corrosion product was composed of various iron oxides, including about 70% magnetite, which was likely responsible for the hard, adherent, ferromagnetic properties. Only small amounts of chlorine and sulfur were present.

Analysis of the Steel: The tensile properties of the pipe and elbow were normal. The chemical composition of the elbow met the specification. The chemical composition of the pipe deviated from the ASTM A106 requirement that the steel contain at least 0.1% silicon. Two samples of the steel pipe both were found to contain 0.02% silicon, which meets the requirements of both API 5L grade B pipe and ASTM A53 grade B seamless pipe. It is unlikely that the deviation influenced the external corrosion. However, we have seen other cases in which the silicon killed steels appeared to be slightly more resistant to some forms of internal corrosion. The small difference in composition may explain the differences in the patterns of internal corrosion observed between the elbow and the pipe (i.e., general corrosion vs. pitting).

Microstructural Analysis: The metallographic cross sections of the pipe, elbow, and girth weld showed no metallurgical anomalies. All microstructures were as expected. The pipe and the elbow both consisted of fine pearlite and proeutectoid ferrite phases, as is typical for hot worked

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mild steel. The cross sections showed that the mill scale (magnetite) on the outside surface of the pipe was intact except in areas of corrosion pits, indicating that the surface was not prepared by abrasive blasting prior to coating. The microstructures are illustrated in Figures 40-48. See the figures for explanation of the illustrated features.

Determination of Corrosion Mechanism: The determination of the likely mechanism for the external corrosion was based mainly upon the characteristics of the corrosion product and the morphology of the corrosion. As noted above, the external corrosion product is virtually all iron carbonate. Iron carbonate is most commonly associated with corrosion resulting from exposure of steel to wet CO_2 . However, several sources discuss the formation of iron carbonate in fresh and salt waters where CO_2 corrosion is unlikely[2 3 4 5]. The references cite the finding of siderite among fresh water and salt water corrosion products but do not describe the morphology of the metal loss associated with the siderite or the corrosion rates related to its formation. Reference 2 relates the formation of siderite to near neutral pH conditions (i.e., about pH 7.2 to 9.4) in which some alkalinity is present, and oxygen is either absent or in which the oxidation of ferrous iron Fe(II) to Fe(III) is kinetically inhibited. Examples of oxidation inhibitors that would favor the formation of siderite include natural organic matter and calcium. The same reference, though, describes siderite as a relatively protective corrosion product, relative to the protectiveness of other corrosion products.

Siderite has also been shown to be related to microbiological processes[6 7 8], although it is less commonly cited than some other corrosion products as a MIC-related corrosion product in the corrosion literature.

[2] Wilson, B.M., Johnson, D.L., et.al., "Corrosion Studies on the USS Arizona with Application to a Japanese Midget Submarine" TMS website at http://www.tms.org/pubs/journals/jom/0710/wilson-0710.html
[3] AWWA Research Foundation "Internal Corrosion of Water Distribution Systems", ISBN 0898677599, published by American Water Works Association, 1996
[4] McNeill, L.S., Edwards, M. "Review of Iron Pipe Corrosion in Drinking Water Distribution Systems"
[5] Cook, D.C., Peterson, C. E., "Corrosion of Submerged Artifacts and the Conservation of the USS Monitor", AIP Conference Proceedings, Journal Vol 765, Issue 1,International Symposium on the Industrial Applications of the Mossbauer Effect, Madrid, Spain, May 2006
[6] Zhang, C.L., Horita, J, et. al., "Temperature-Dependant Oxygen and Carbon Isotope Fractionations of Biogenic Siderite" downloaded from http://www.sciencedirect.com
[7] Weber, K. A., Picardal, F.W., Roden, E.E. "Microbially Catalyzed Nitrate Dependant Oxidation of Biogenic Solid-Phase Fe(II) Compounds" *Environmental Science & Technology*, 2001, vol. 35,No. 8, pp 1644-1650.
[8] Mattiesen, H., Hilbert, L.R., Gregory, D.J., "Siderite as a Corrosion Porduct on Archaeological Iron From a Waterlogged Environment" *Studies in Conservation,* vol 48., 2003, pp 183-194

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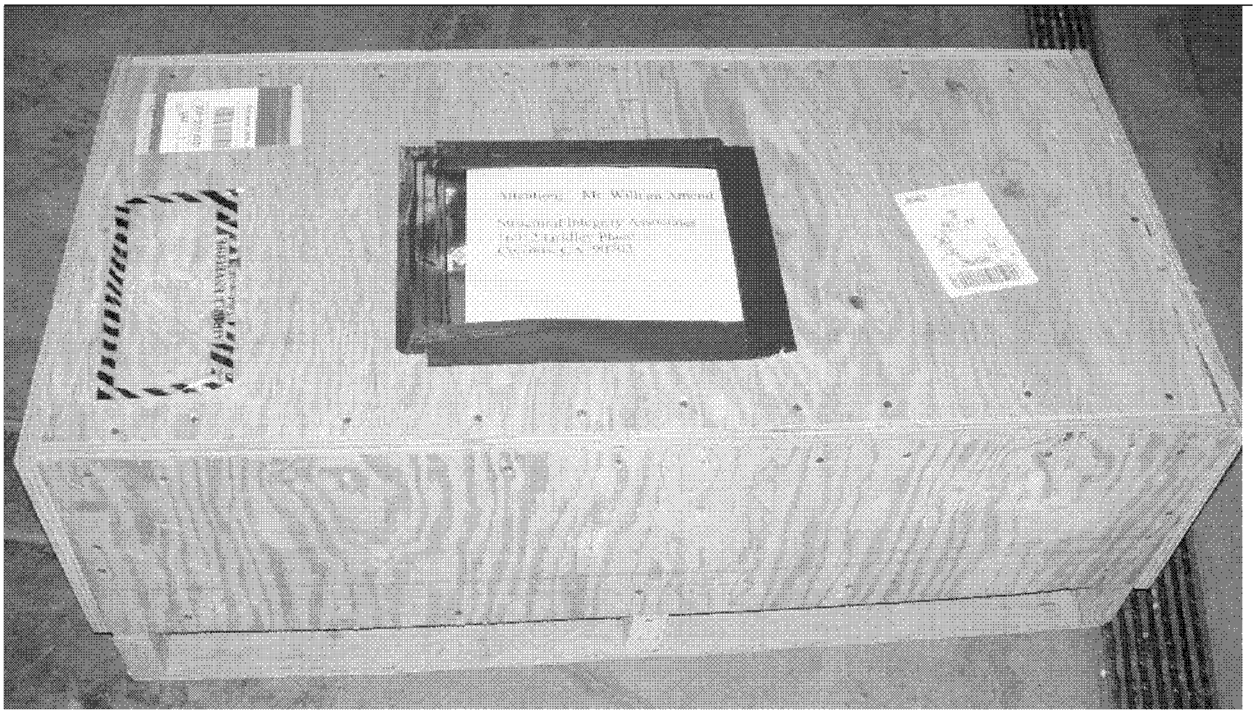

Figure 4 - Shipping container for pipe sample, as-received on March 23, 2009

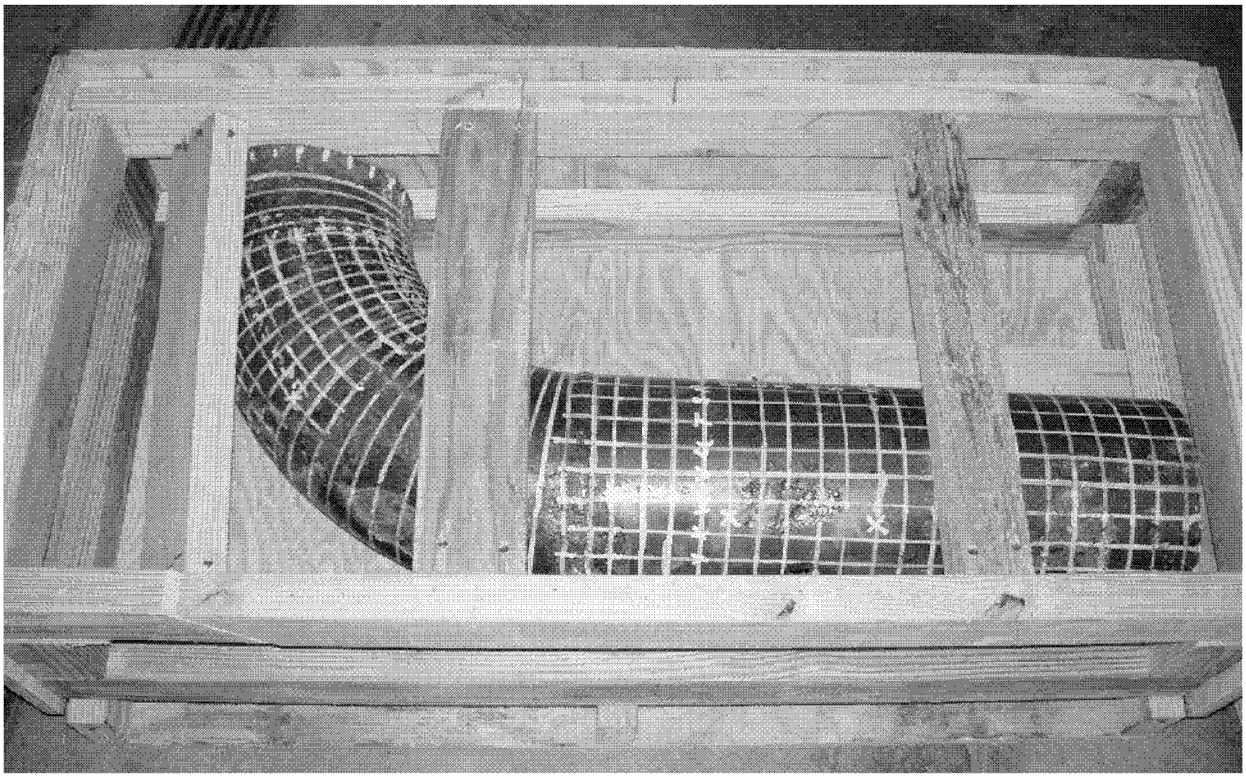

Figure 5 – Pipe sample as-received in the shipping container.

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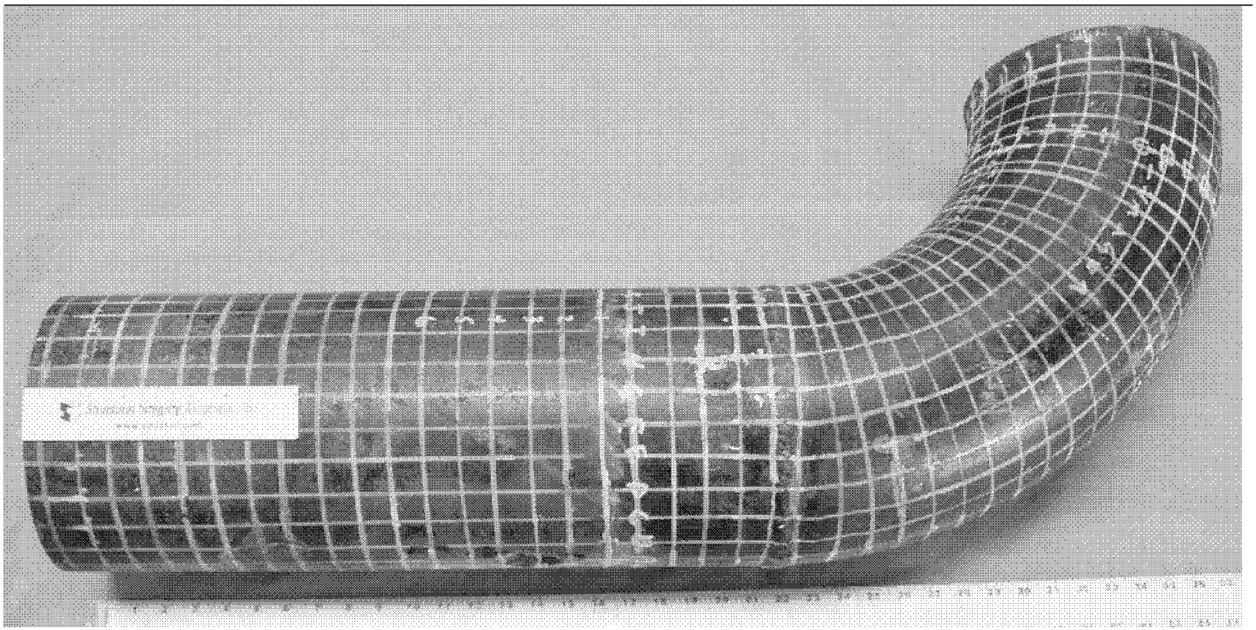

Figure 6 - Pipe sample as received, view 1

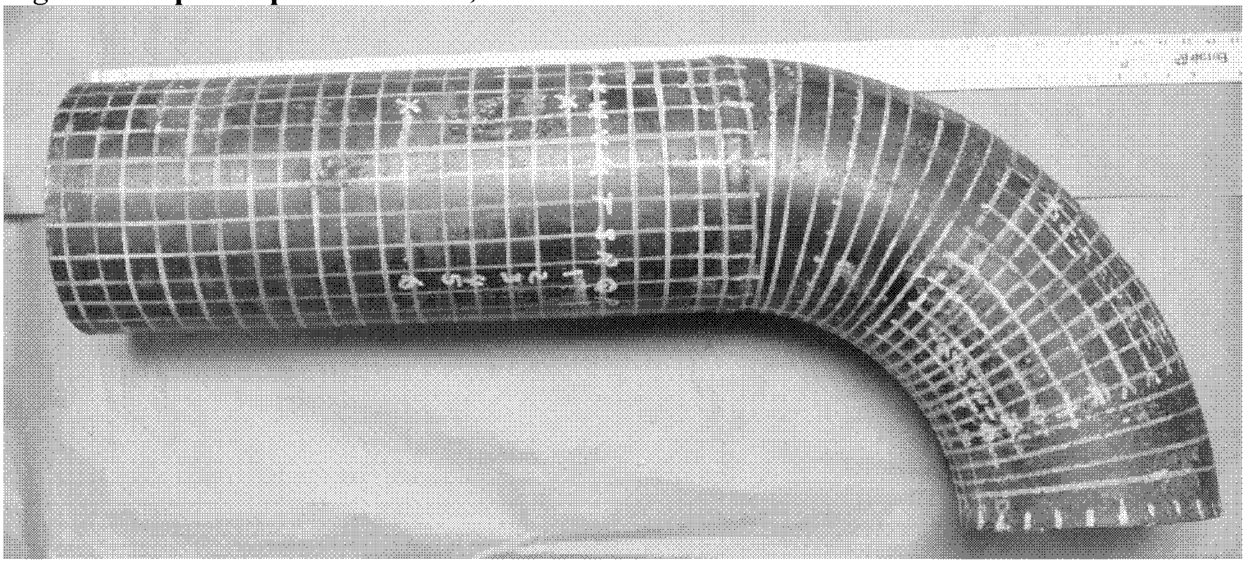

Figure 7 - Pipe sample, as-received view 2

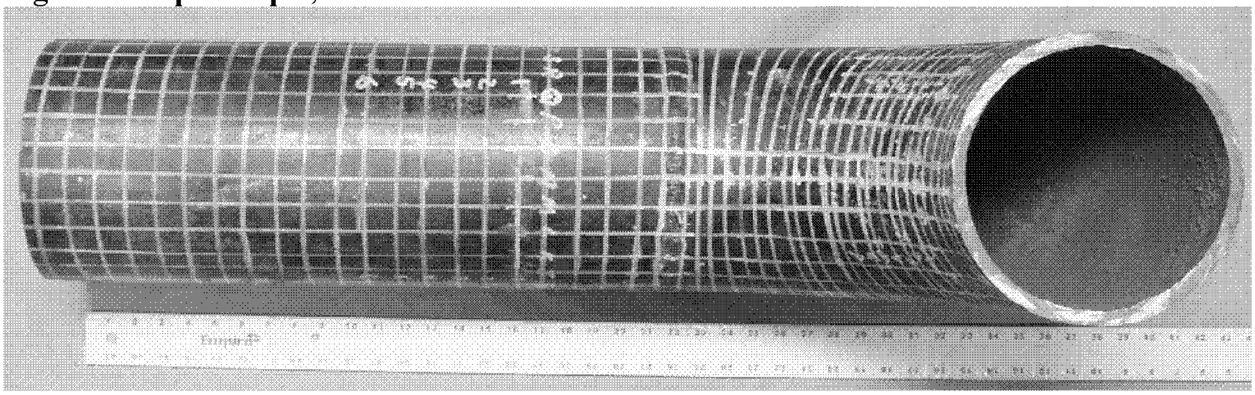

Figure 8 - Pipe sample, as-received, view 3

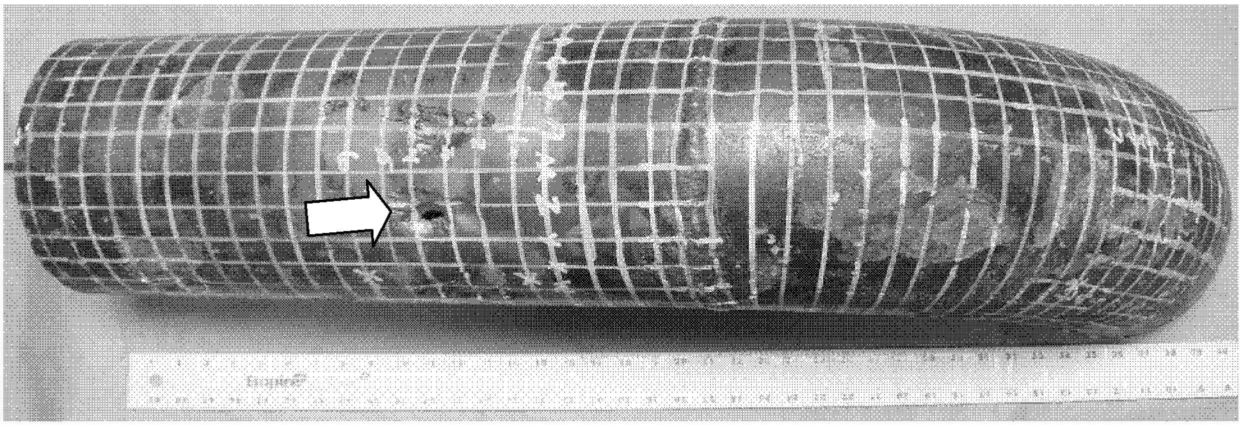

Figure 9 - Pipe sample, as-received , view 4. Arrow points to location of leak

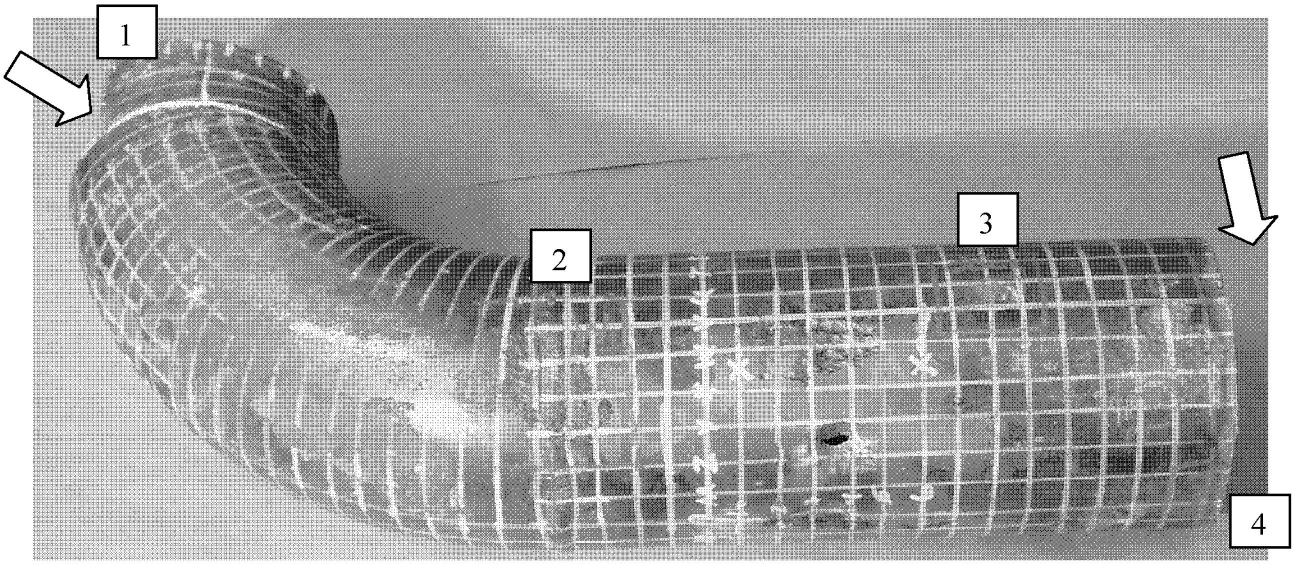

Figure 10 - Pipe sample marked with red boxes to show locations of samples removed for further analysis

1. Elbow sample with ID corrosion for metallographic examination,
2. Girth weld sample for metallographic examination,
3. External corrosion pit with internal corrosion on pipe for metallographic examination and EDS analysis of the corrosion product
4. Second sample of pipe for metallographic examination (investigation of possible ERW seam).

Segments at arrows at ends of the sample were previously removed for tensile testing and analysis of steel composition.

IPEC00203182

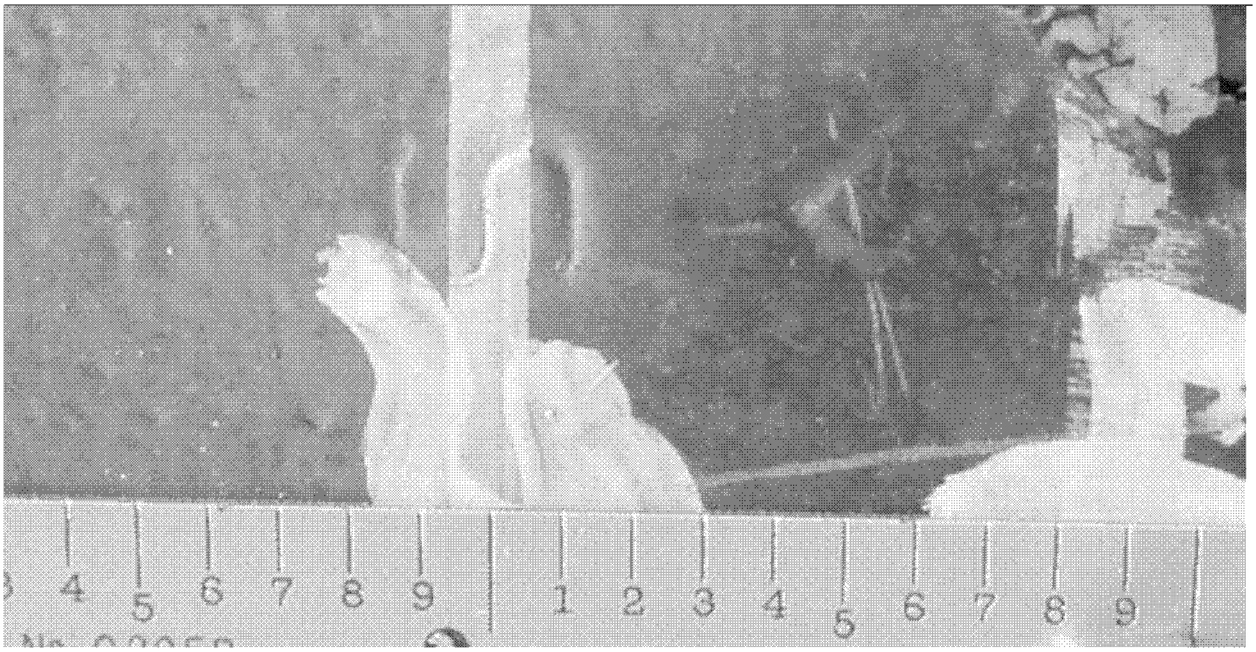

Figure 11 - "YS" stamp mark on pipe.
The stamp marks indicate that this pipe is pipe manufactured by Youngstown Steel. At this location the stamps have been partially polished away by erosion from the nearby leak (in this pipe).

Figure 12 - API monogram stamp mark on pipe.
Monogram indicates that pipe met requirements of API specification 5L. It may have also been manufactured to meet ASTM specifications. Grids outlined by white lines are approximately 1" x 1".

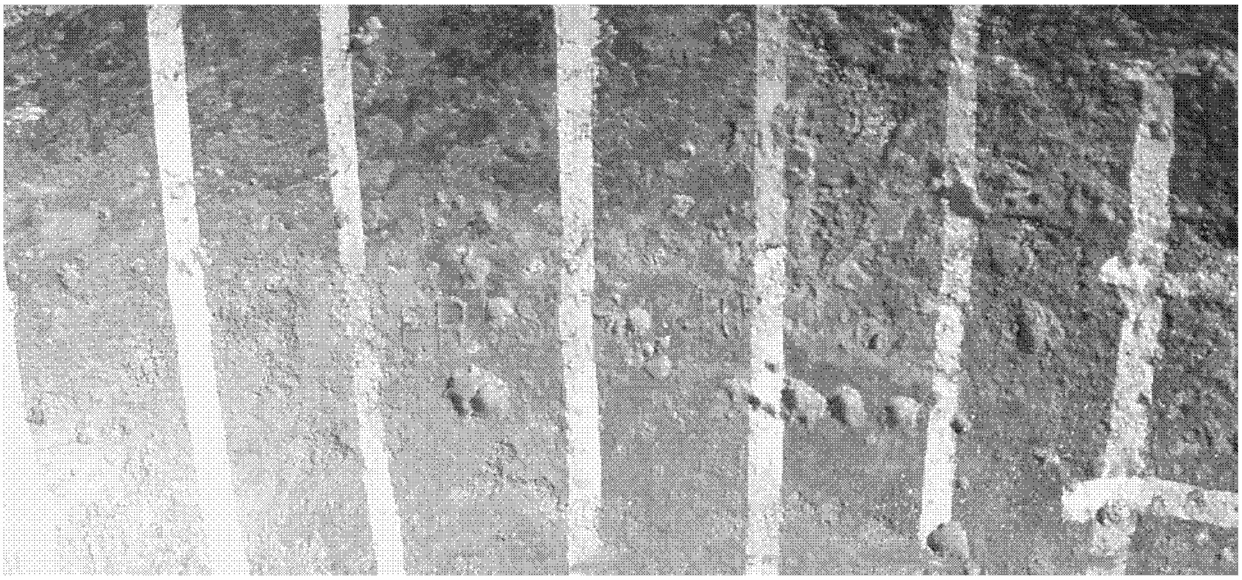

Figure 13 - Manufacturer's stamp marks on the neutral axis of the elbow.
See next figure for detail of the stamp mark after cleaning.

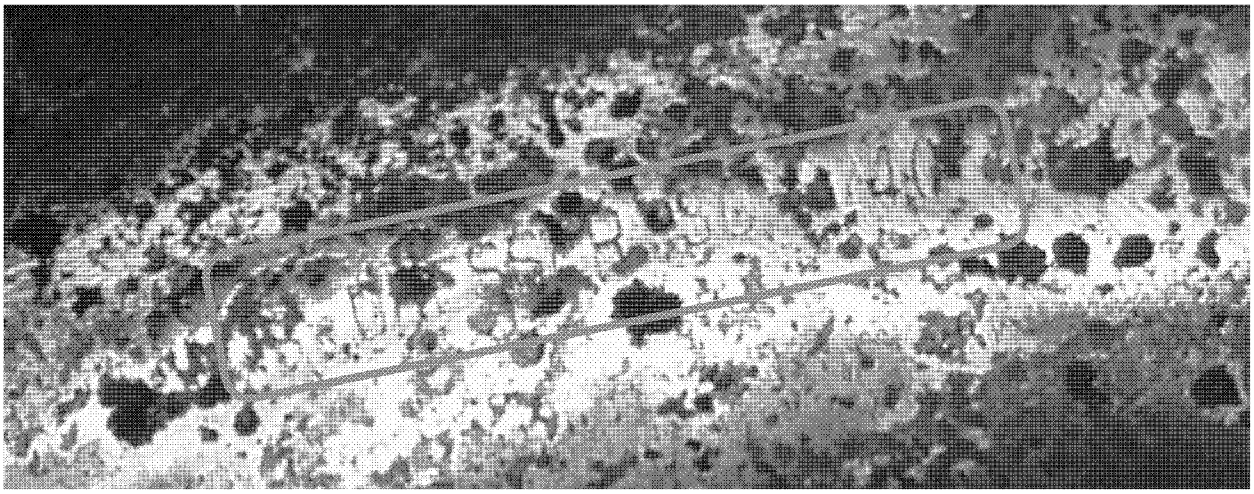

Figure 14 - Manufacturer's stamp mark after light abrasion with sandpaper.
The stamp marks on the neutral axis of the elbow identify it as an 8" schedule 40 fitting manufactured by Dresser. The grade of the fitting is obscured by corrosion.

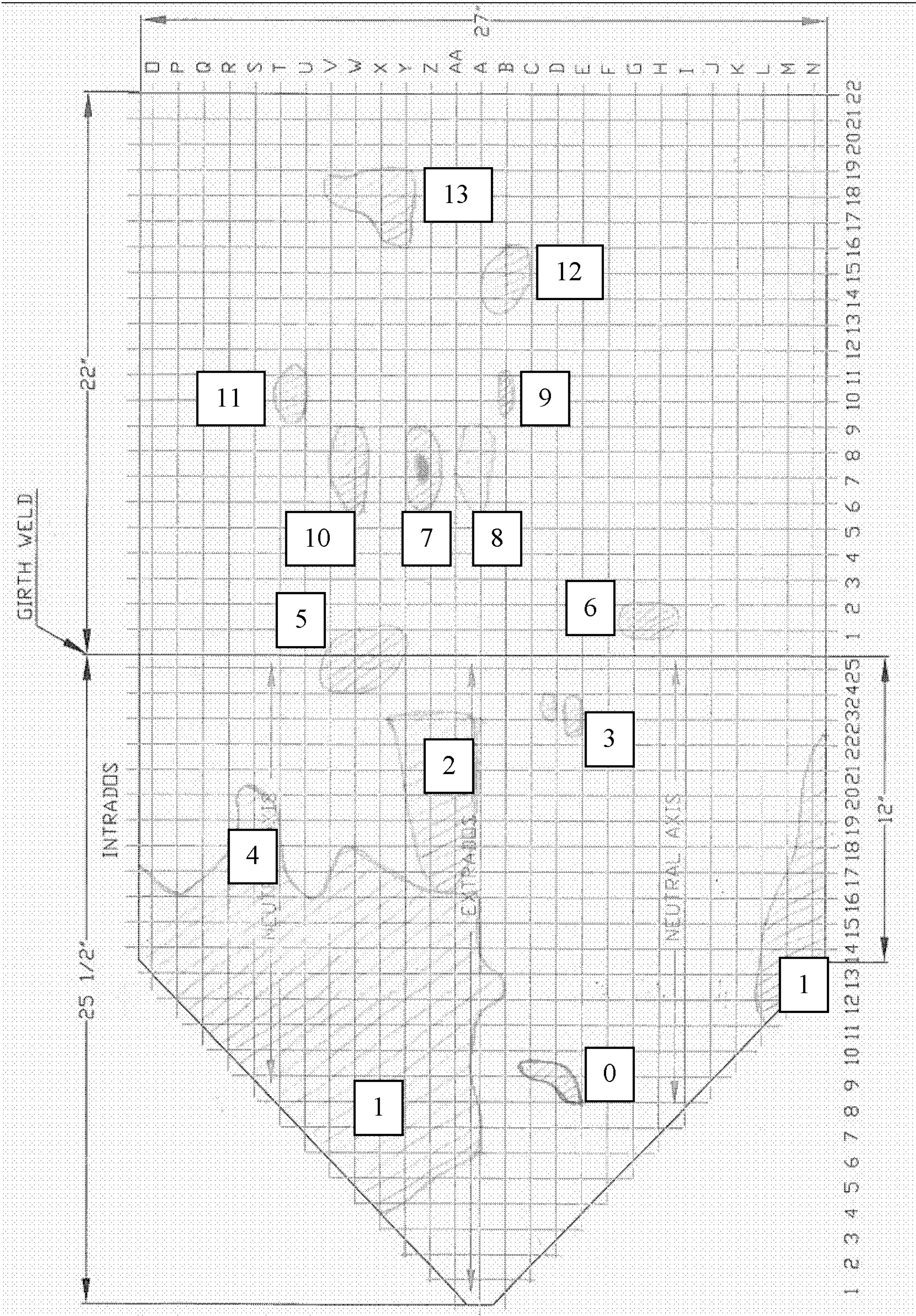

Figure 15 – Map of external corrosion
Major areas of corrosion are sketched and numbered. The axial grid lines (marked A, B, C, etc.) are as marked by Entergy. The leak is at location #7. See Table 3 for additional details

IPEC00203185

Table 3 – Dimensions of Major Areas of Corrosion

Area (see Fig. 15)	Maximum length (inch)	Maximum depth (inch)	Maximum width (inch)	CSA (%) (Note 1)	Related Figures
0	1.7	0.11	2.6	2.3	16
1	9.7	0.20	19	30.2 (note 2)	17, 18
2	7	0.17	3.5	4.7	-
3	1.2	0.09	0.75	0.5	-
4	See Area 1data, see note 3				19, 20
5	2.8	0.09	3.2	2.3	21, 22, 38-41
6	1.8	0.276	2	4.4	23
7	2.9	Hole (leak)	1.5	3.8	24,26
8	3.6	0.247	1.4	2.7	24
9	1.8	0.103	0.5	0.4	24, 25
10	3.4	0.184	1.8	2.6	26
11	2.3	See note 4	1.3	NA	27, 28
12	2.4	0.251	2	4.0	-
13	3.2	0.171	3	4.1	29-32

Notes:

1) The %CSA represents the portion of the pipe wall area (as measured in a circumferential cross section through the pipe) that is affected by the metal loss. It relates to the detectability of the corrosion using guided wave UT inspection methods. Larger %CSA values typically represent flaws that are more easily detectable. The %CSA (cross sectional area) of each significant flaw is approximated by the following equation:
   % CSA =100 x (2/3 x flaw depth x flaw width)/(pi x outside radius^2 – pi x inside radius^2)
   For the purpose of detectablility by use of guided wave UT inspection ,the %CSA separate flaw areas located in the same circumferential plane may be combined to estimate the total %CSA, as shown below:

Flaw Areas in a shared circumferential plane	Total % CSA
0, 1	32.5
2, 4	34.9
2, 3	5.2
5, 6	6.7
7, 8, 10	9.1
9, 11	>0.4 (see note 4)

2) The majority of the corrosion was shallow, therefore the equation used to estimate %CSA is overestimating the area of metal loss
3) This area is continuous with Area 1
4) This pit was metallographically cross sectioned with corrosion product intact. Pit depth could not be measured and cross section may not have revealed deepest point

IPEC00203186

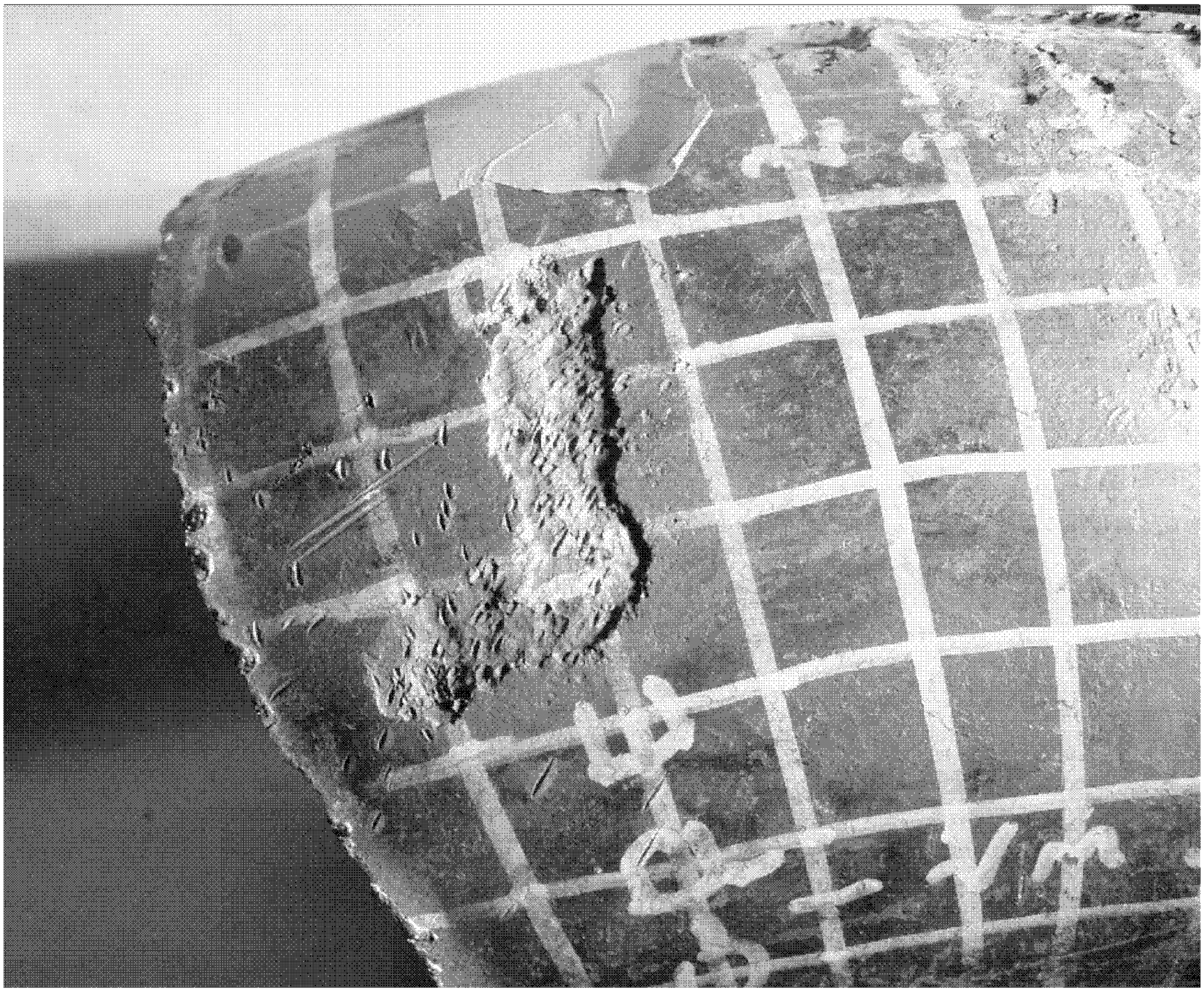

Figure 16 - External corrosion on elbow (as-received condition) designated Area 0
Note the absence of any corrosion surrounding the “L” shaped pit.

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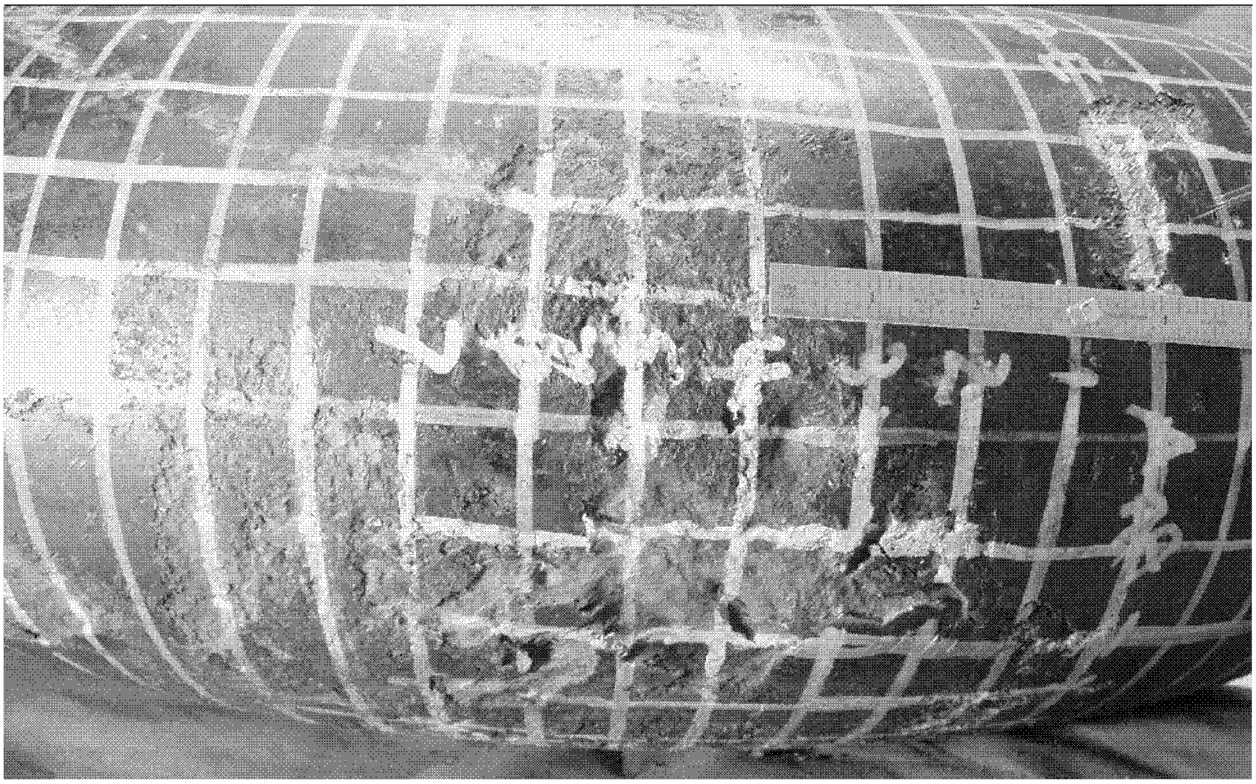


Figure 17 – External corrosion on the extrados of the elbow, as-received; designated Area 1

IPEC00203188

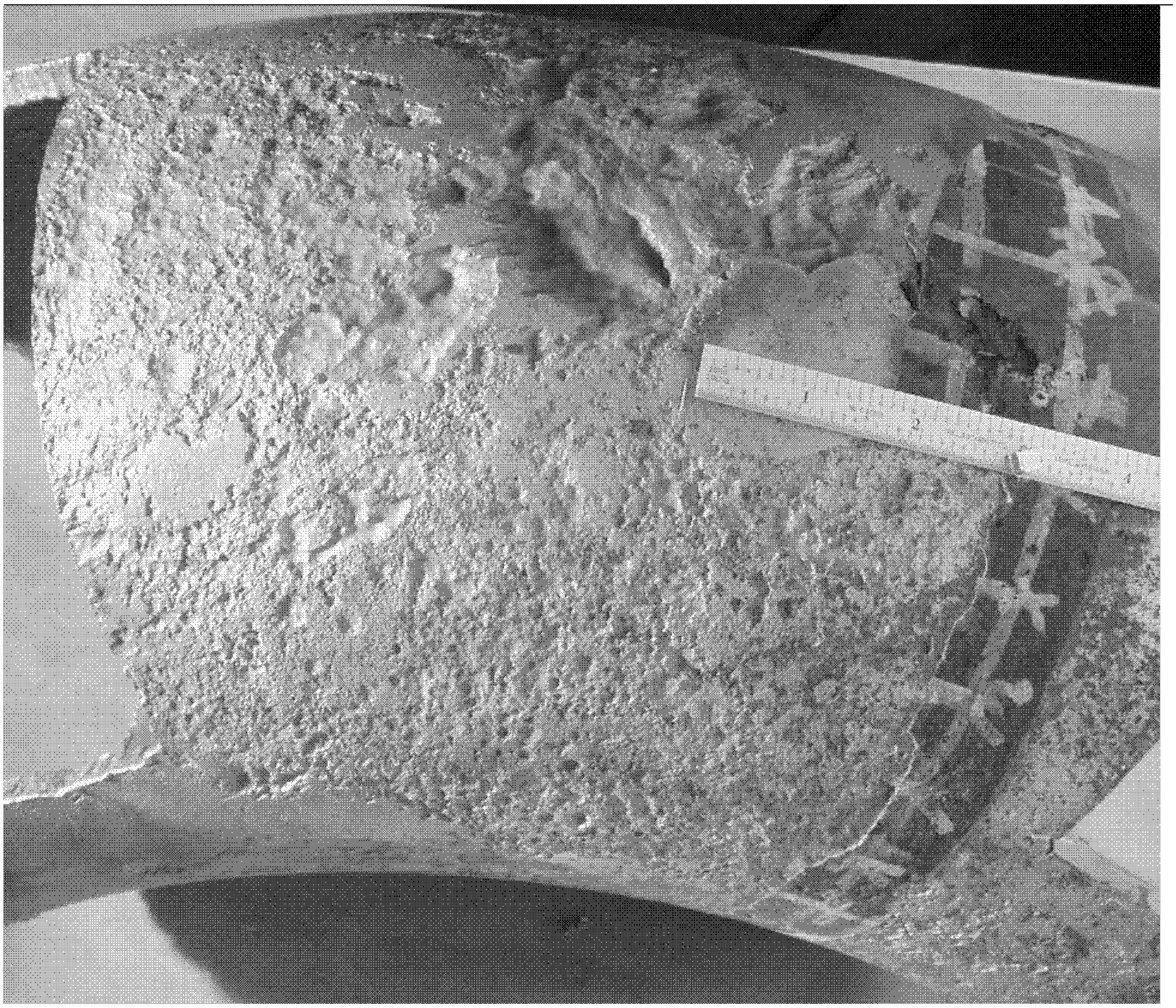


Figure 18-- Extrados of ell after cleaning, Area 1.
Note extensive general corrosion compared to the straight pipe. A circumferential band was masked off to prevent loss of the grid line identifications

IPEC00203189

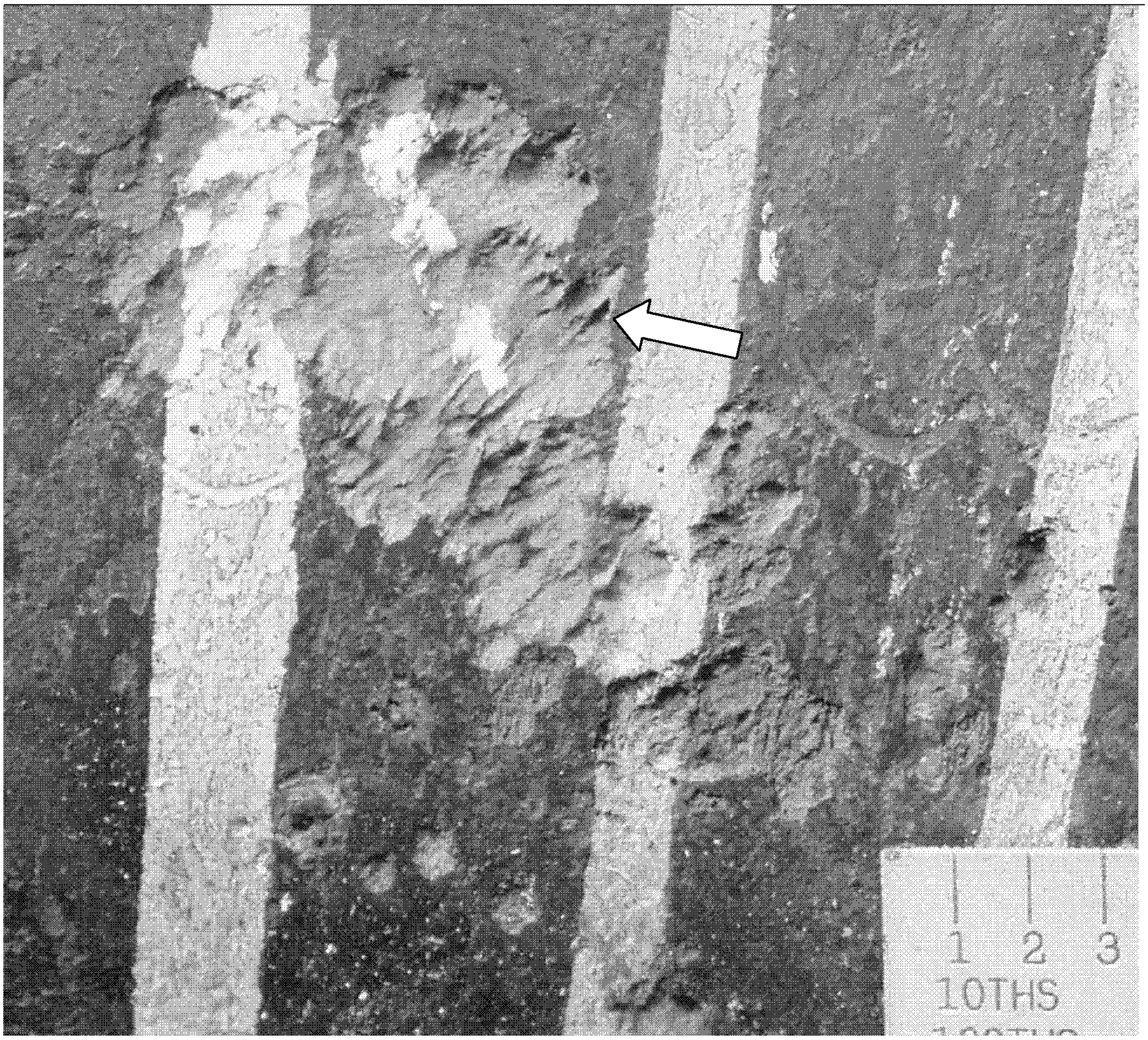


Figure 19 – Detail of corrosion in Area 4, Location 1
Note sharp edges of pits and tunnel like features (arrow points to one example of tunneling).

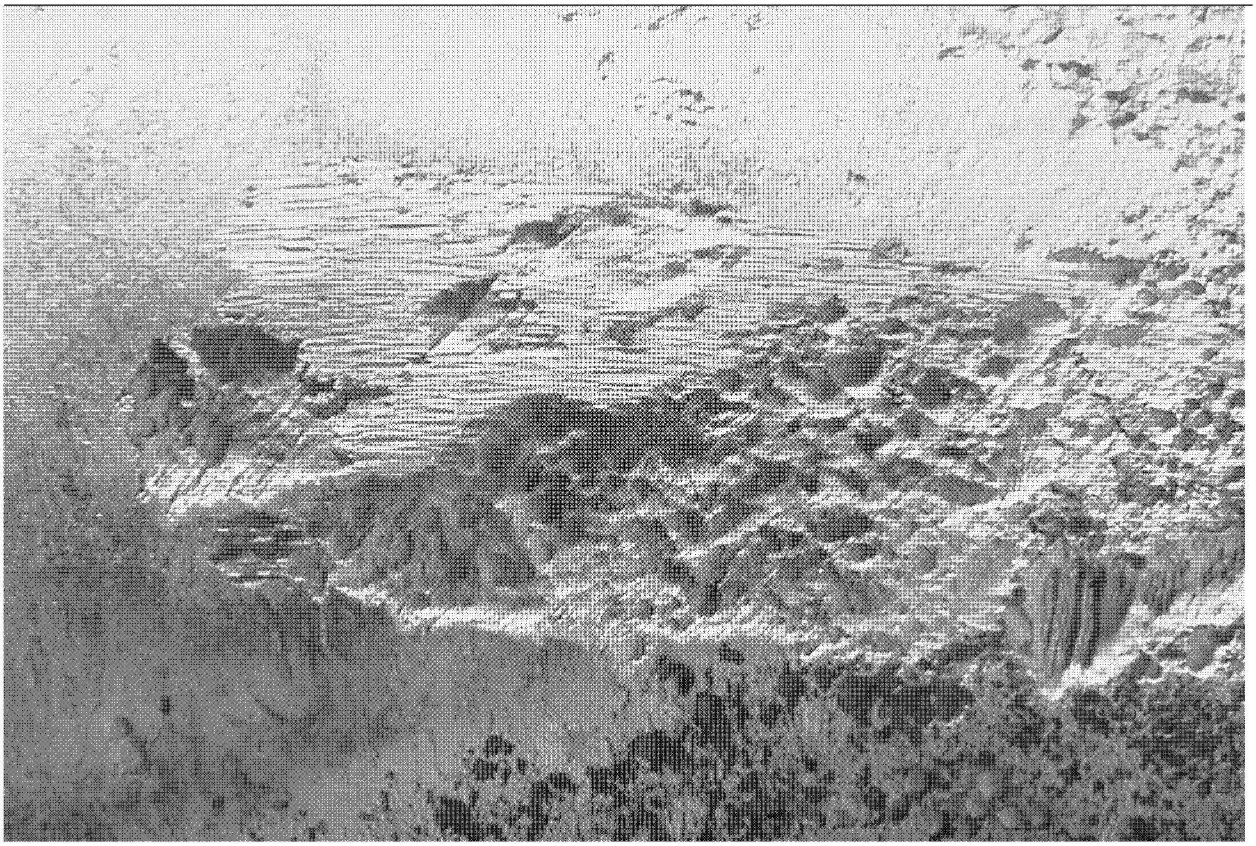


Figure 20 - Area of Area 4, Location 2 after cleaning by glass bead blasting
Note scrape marks. These scrape marks appeared to have discoloration and oxidation comparable to the surrounding uncorroded pipe surface suggesting they may have been formed either during the installation process, or prior to the pipe coating process. If they were formed after coating, the coating would have been damaged and exposed the scraped area to the soil. As a result, the scrape would have been eliminated by subsequent corrosion. The striations are elongated features oriented from lower left to upper right in the round pit at upper left.

IPEC00203191

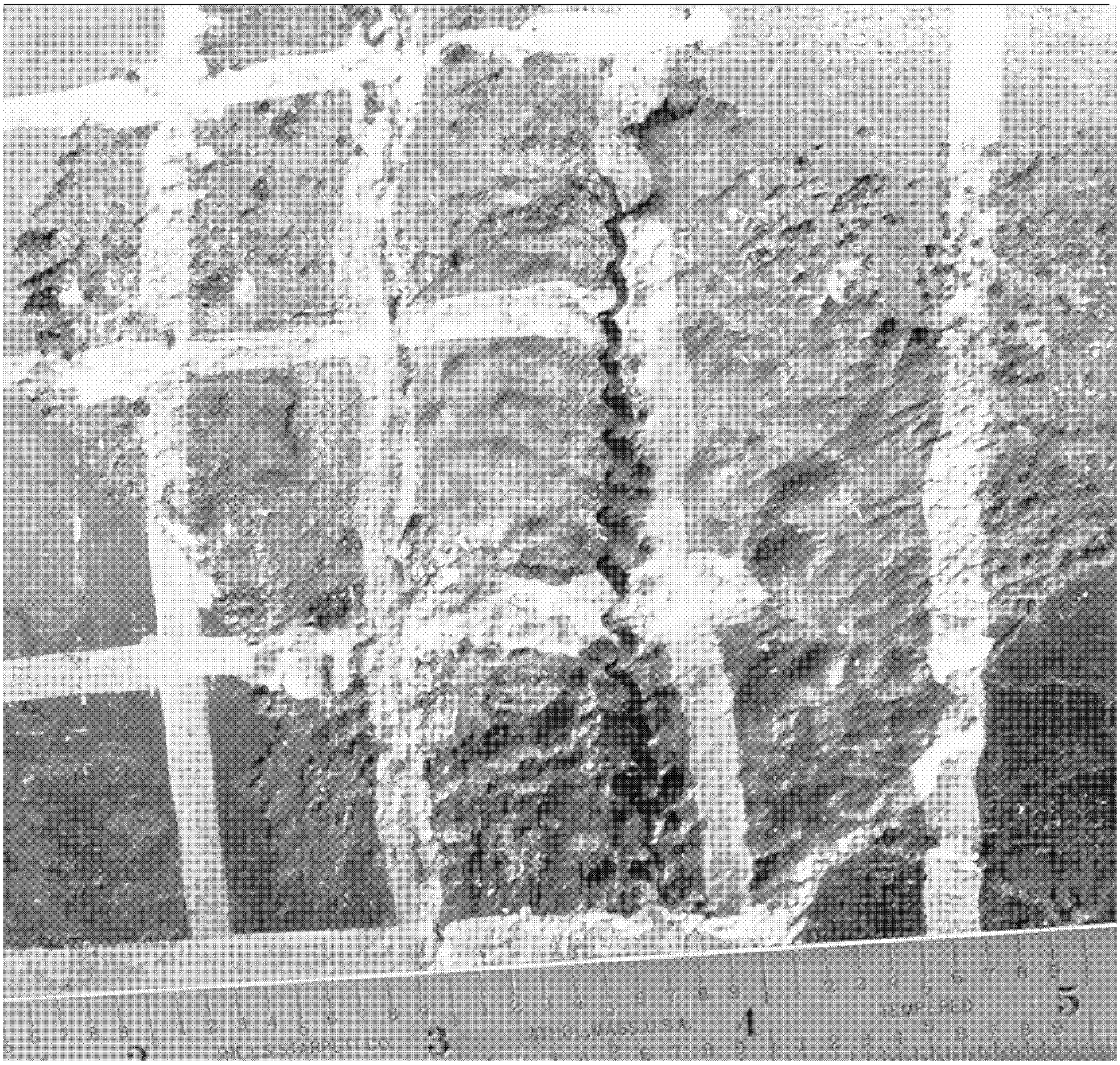


Figure 21 – Detail of corrosion on girth weld in the location designated Area 5.
Note corrosion undercutting the toe of the weld and striations in adjacent corrosion on the elbow. The striations are short linear features oriented about 25 degrees off the longitudinal axis of the pipe and are most visible to the right of the weld

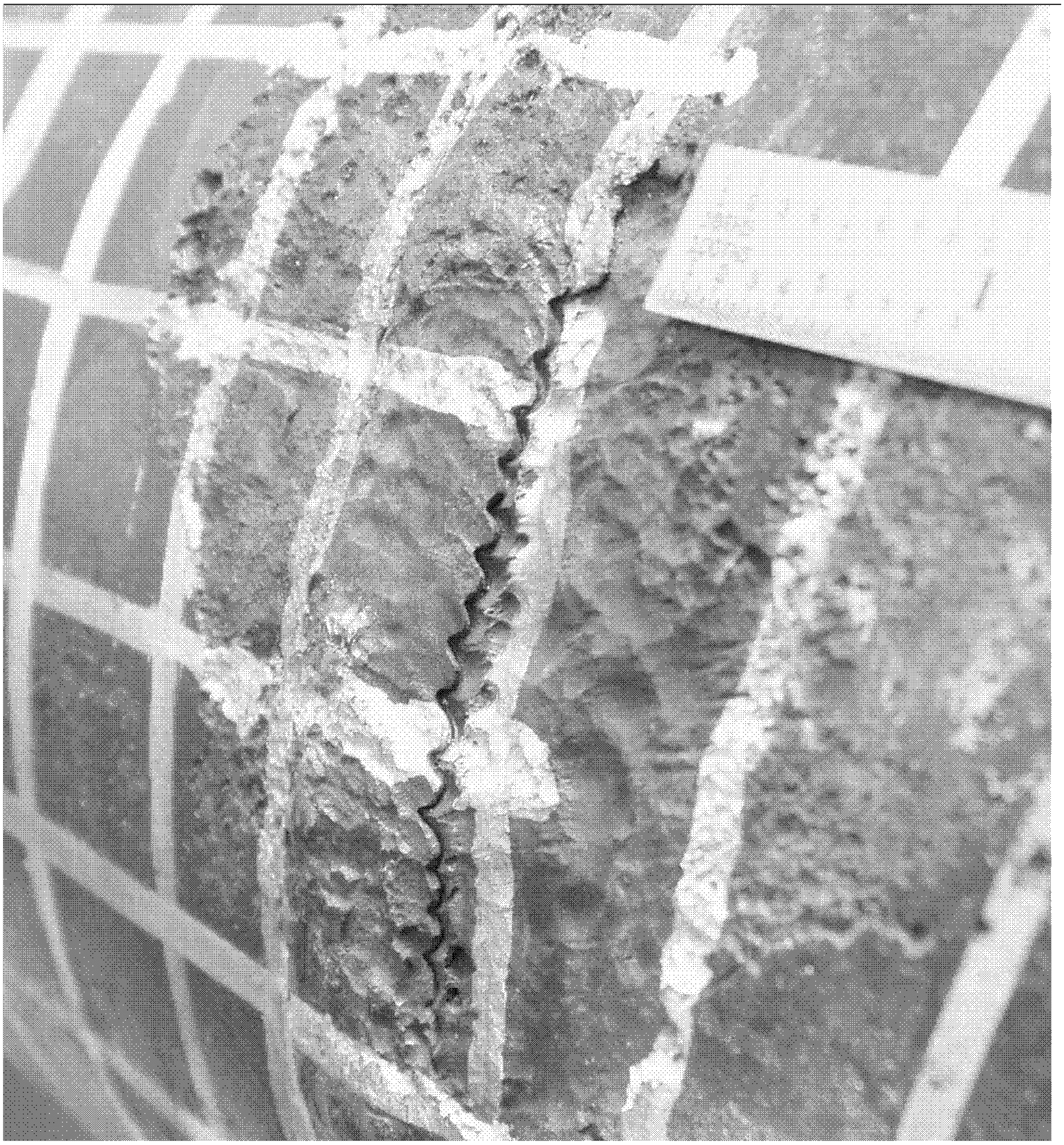


Figure 22 – Second view showing detail of the corrosion undercutting the toe of the weld

IPEC00203193

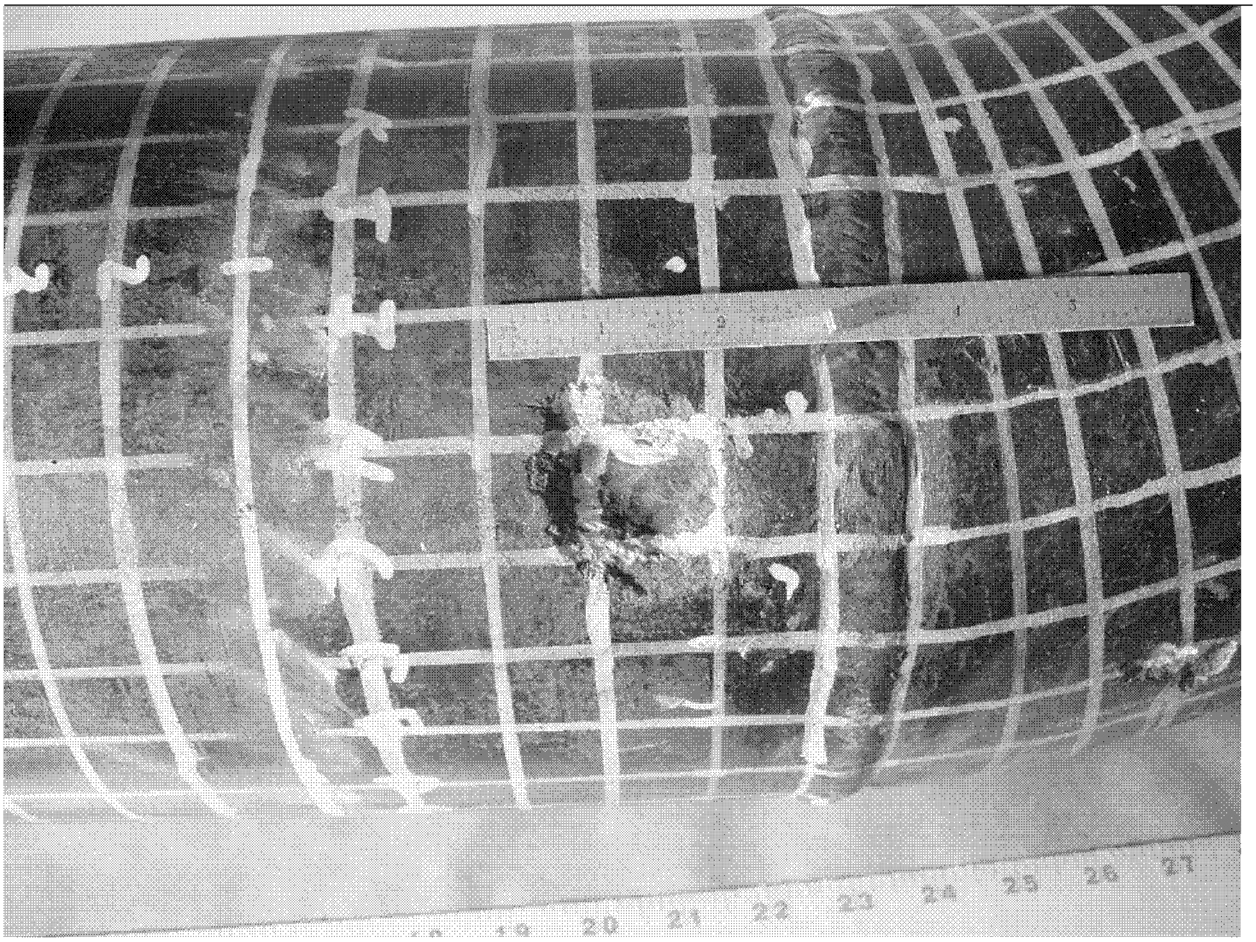


Figure 23 – External corrosion on the pipe (as-received condition), designated Area 6. Note absence of corrosion around this pit.

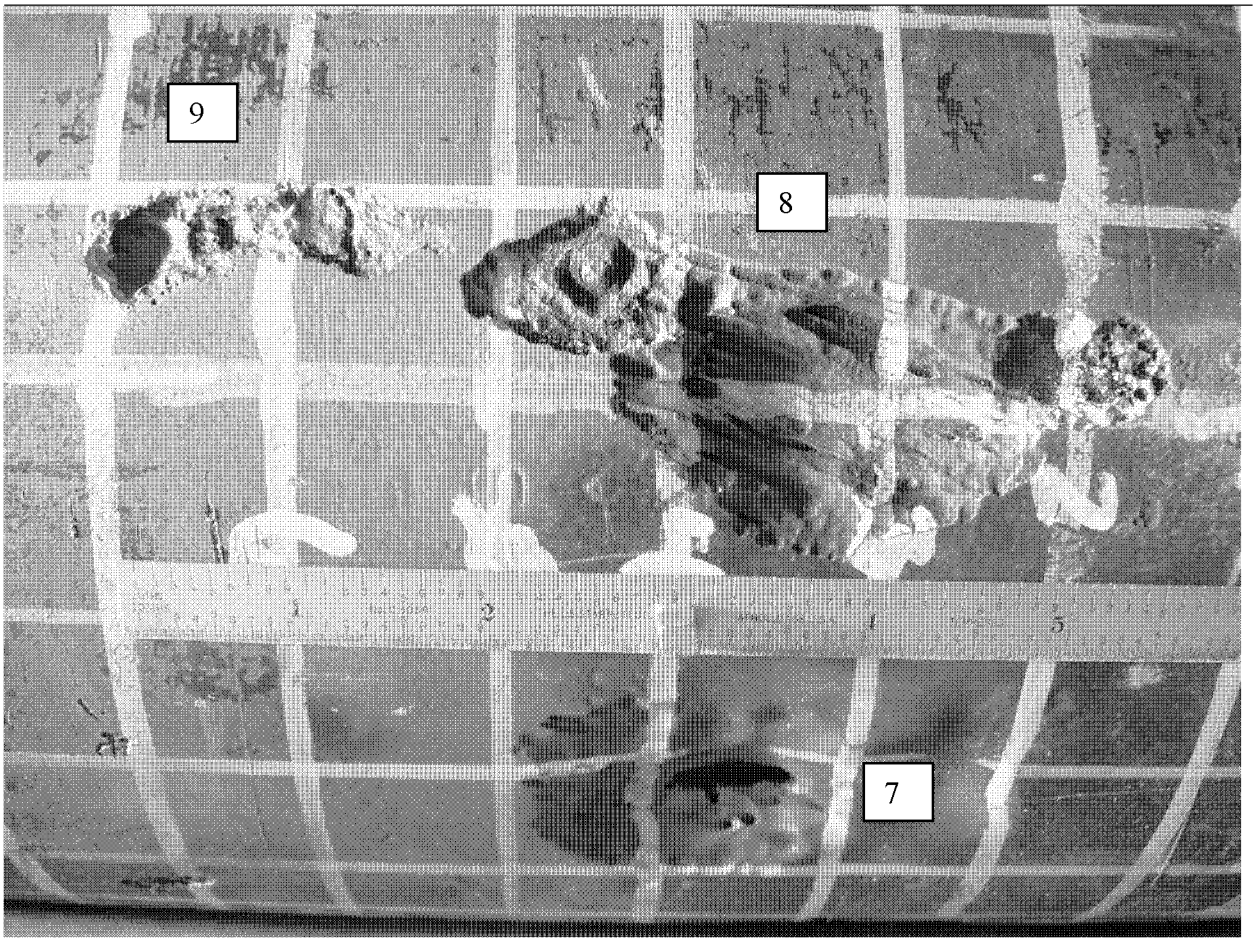


Figure 24 – Outside surface of pipe (as received) showing leak and two other areas of corrosion in addition to identifying "YS" and "API" stamp marks. Areas designated 7, 8, and 9

A very subtle feature that appeared to be an ERW seam runs horizontally through the "YS" stamp mark. Youngstown Steel manufactured both seamless pipe and ERW pipe in this size range. Only the seamless pipe could have met the requirements of ASTM A106. Subsequent metallographic examination of the location showed no microstructural evidence of a seam and the seam-like feature may be the remnants of the embossing wheel that produced the "YS" stamp during the manufacturing process of seamless pipe. The area surrounding the leak (Area 7) was eroded and polished as a result of turbulent water in the area of the leak. In comparison, areas of metal loss a few inches or more from the leak (i.e., see areas 8 and 9) have irregular topographies typical of corrosion that has not been modified by erosion.

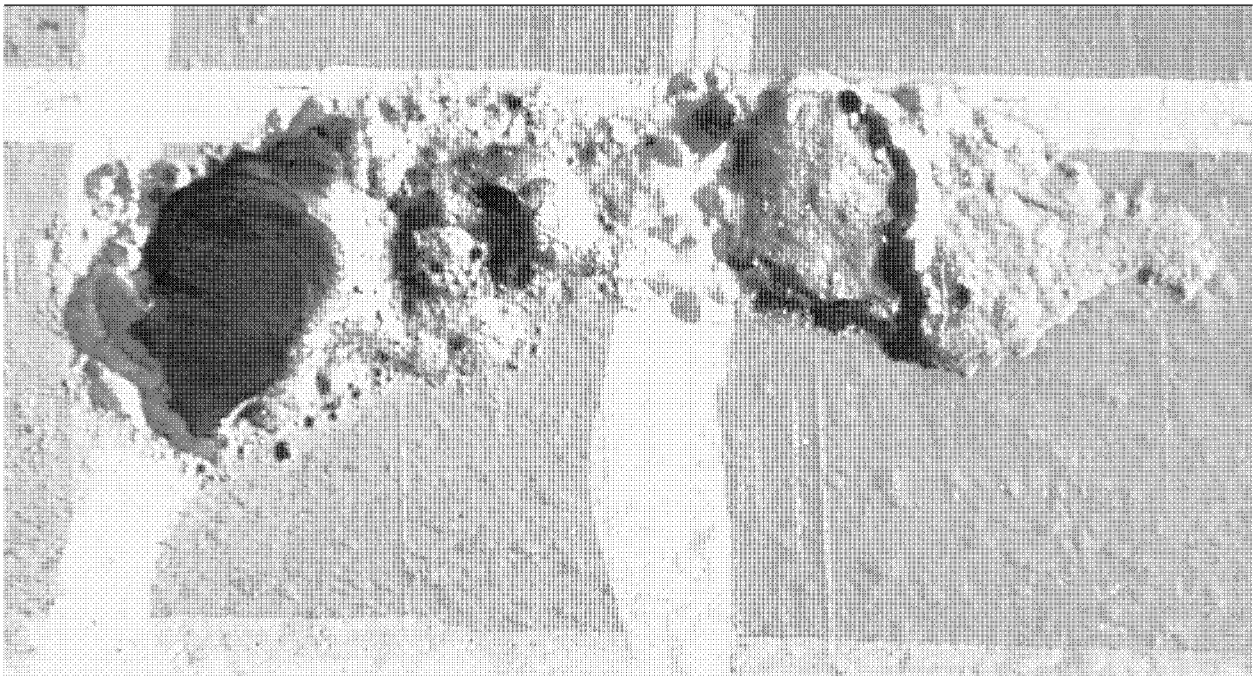


Figure 25 – Detail of Area 9 (as received) showing multitudes of small overlapping pits of various sizes, resulting in an almost spongy appearance

IPEC00203196

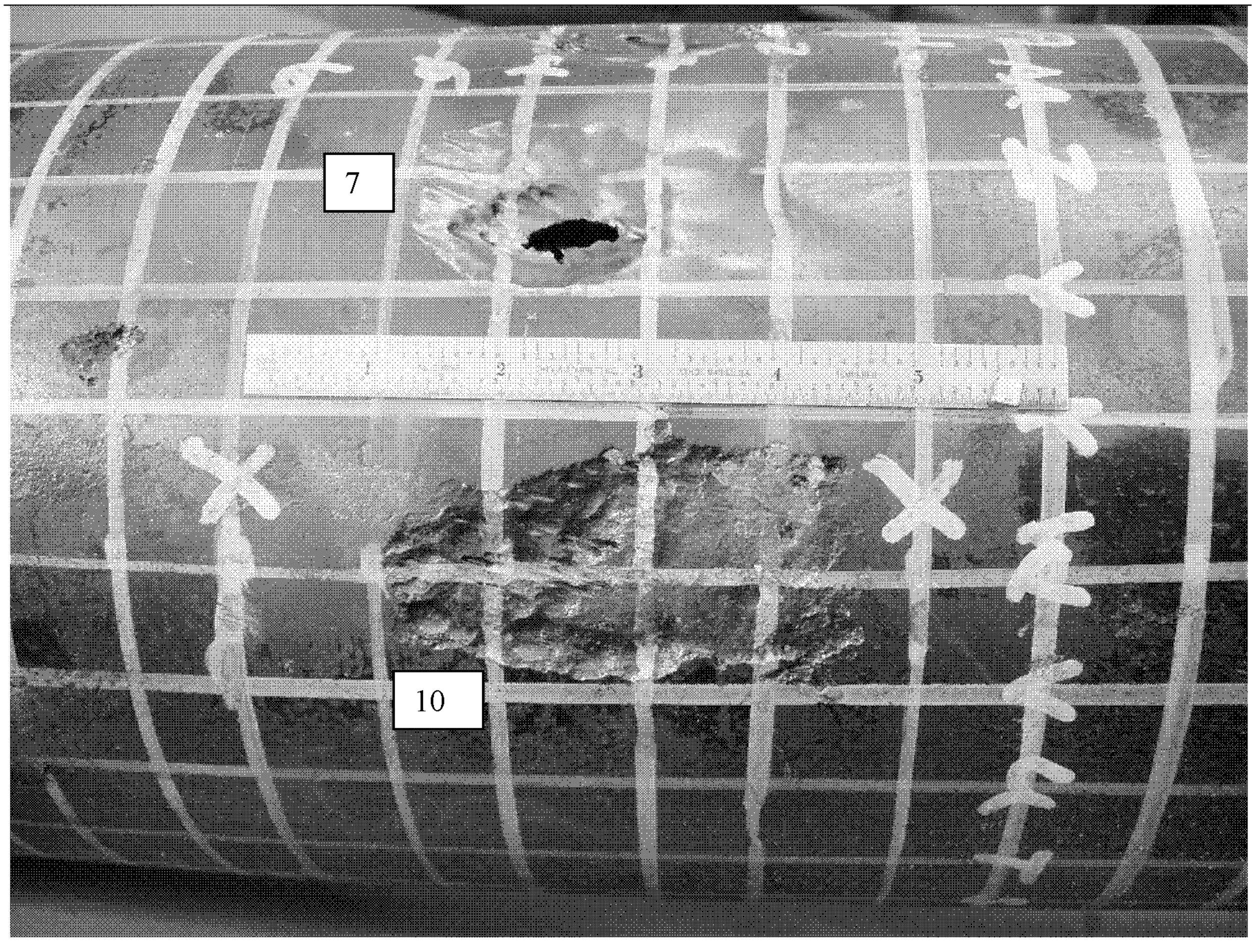


Figure 26 – Another view of the area of the leak and adjacent corrosion in the pipe (as-received), Designated Areas 7 and 10, respectively.
Note polishing (erosion) of the surface surrounding the leak caused by leaking water.

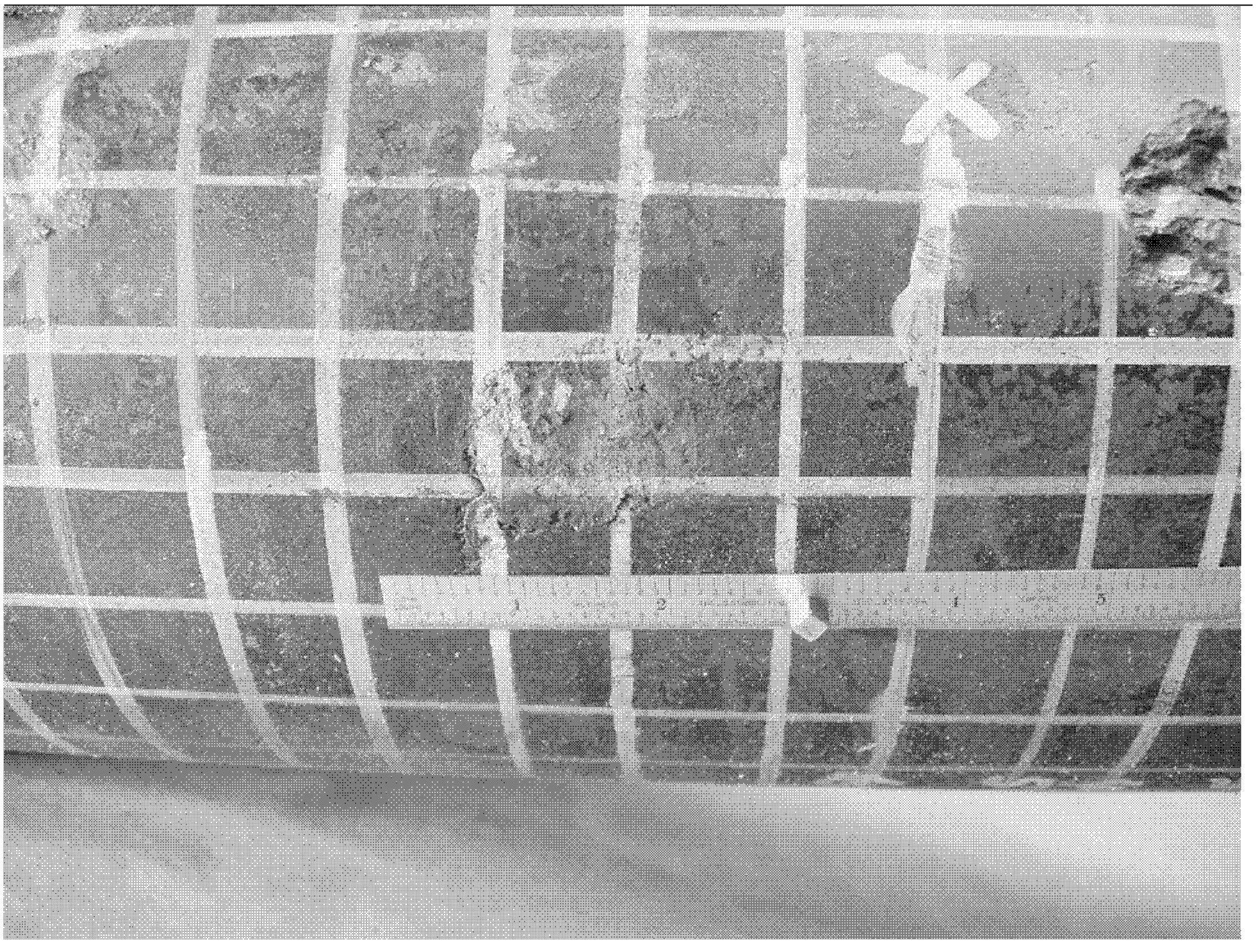


Figure 27 – External corrosion pit in the pipe (as-received condition) designated Area 11. Note absence of corrosion around the pit. In this example the corrosion product fills the area of metal loss so that the corrosion product surface is nearly flush with the pipe surface. See next figure for detail

IPEC00203198

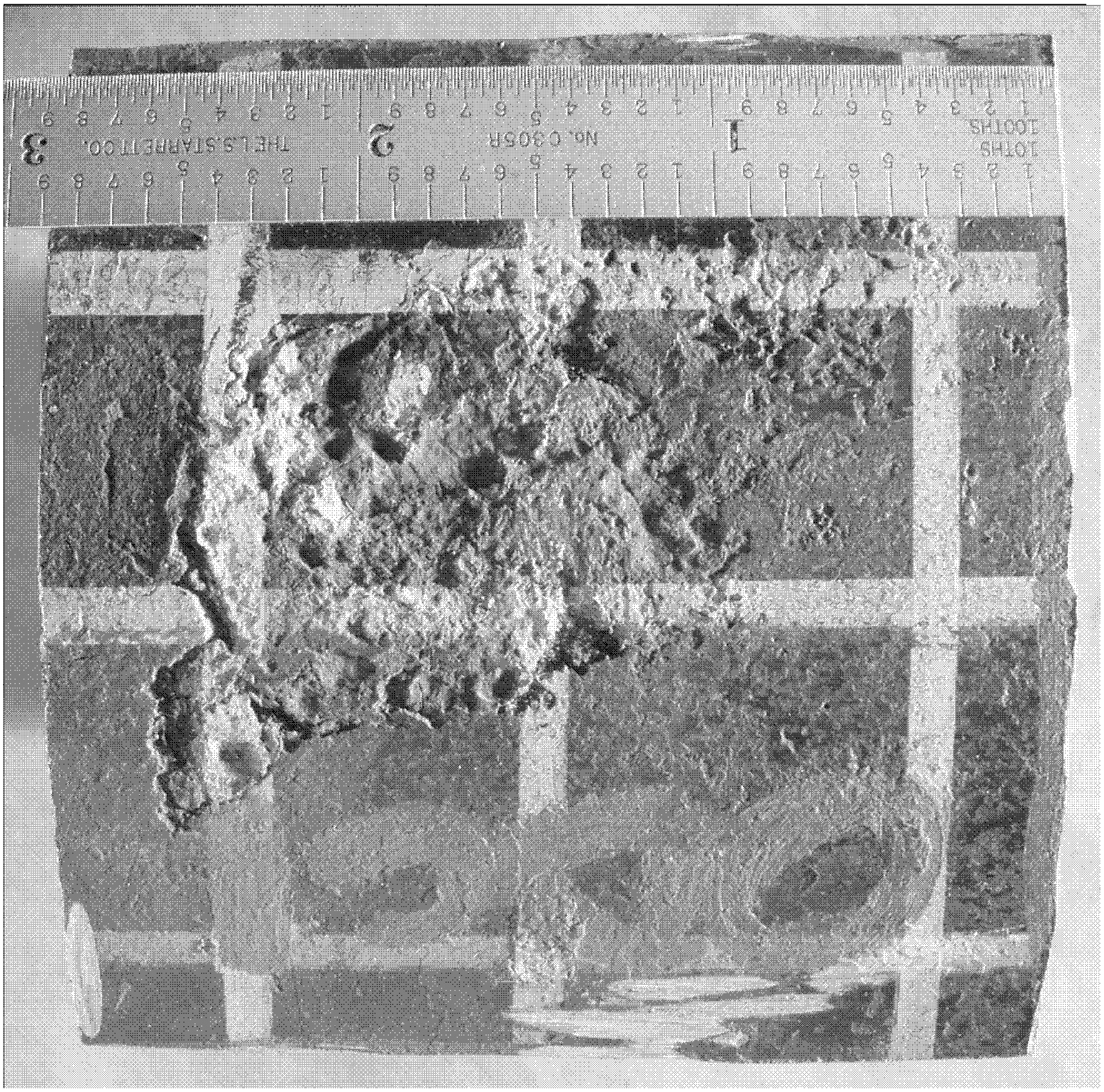


Figure 28 – Detail of Area 11 in previous figure. This sample was cross sectioned for metallographic examination.

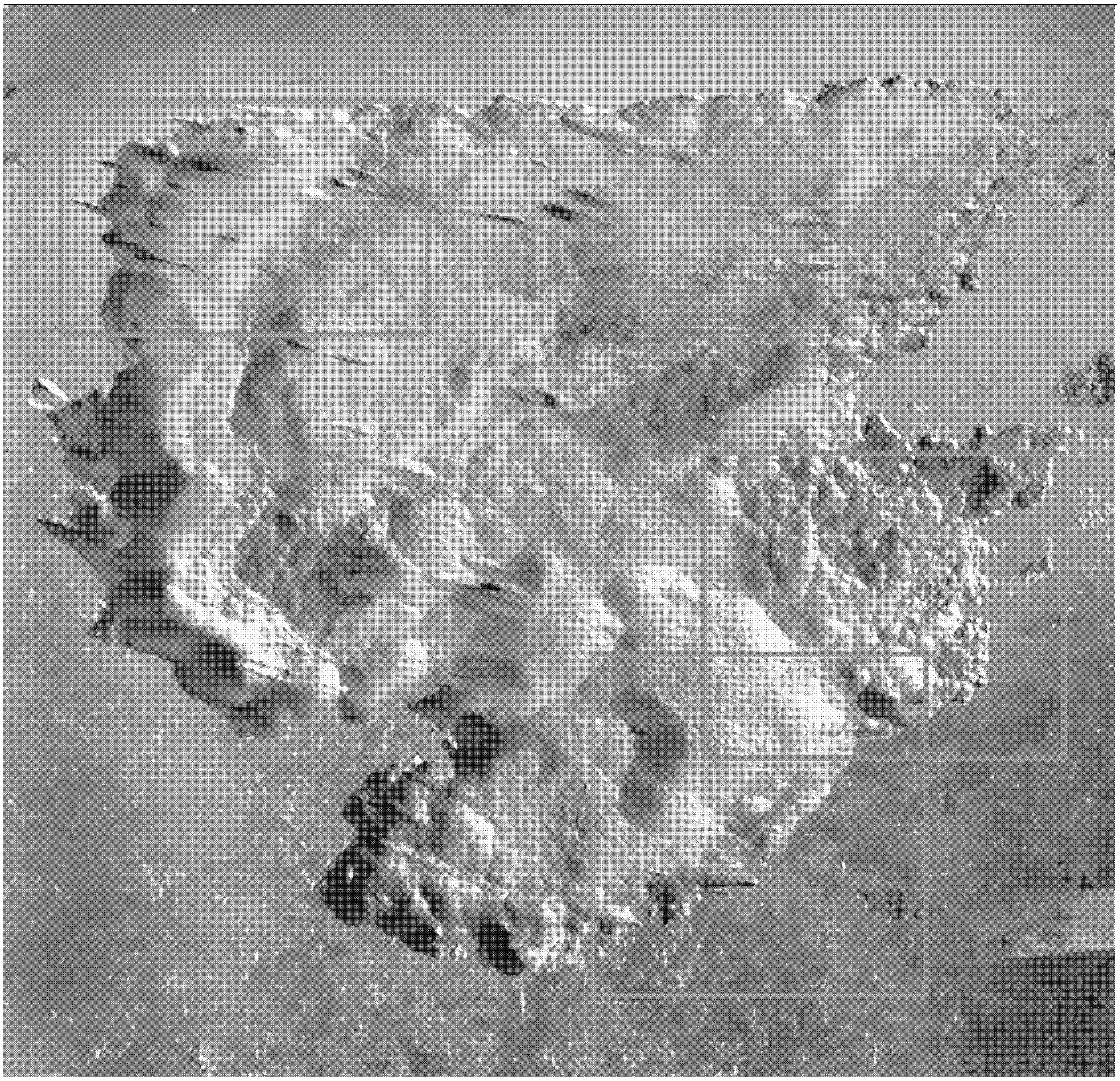


Figure 29 – Detail of Area 13 after cleaning.
See following figures for details of areas bounded by blue boxes.

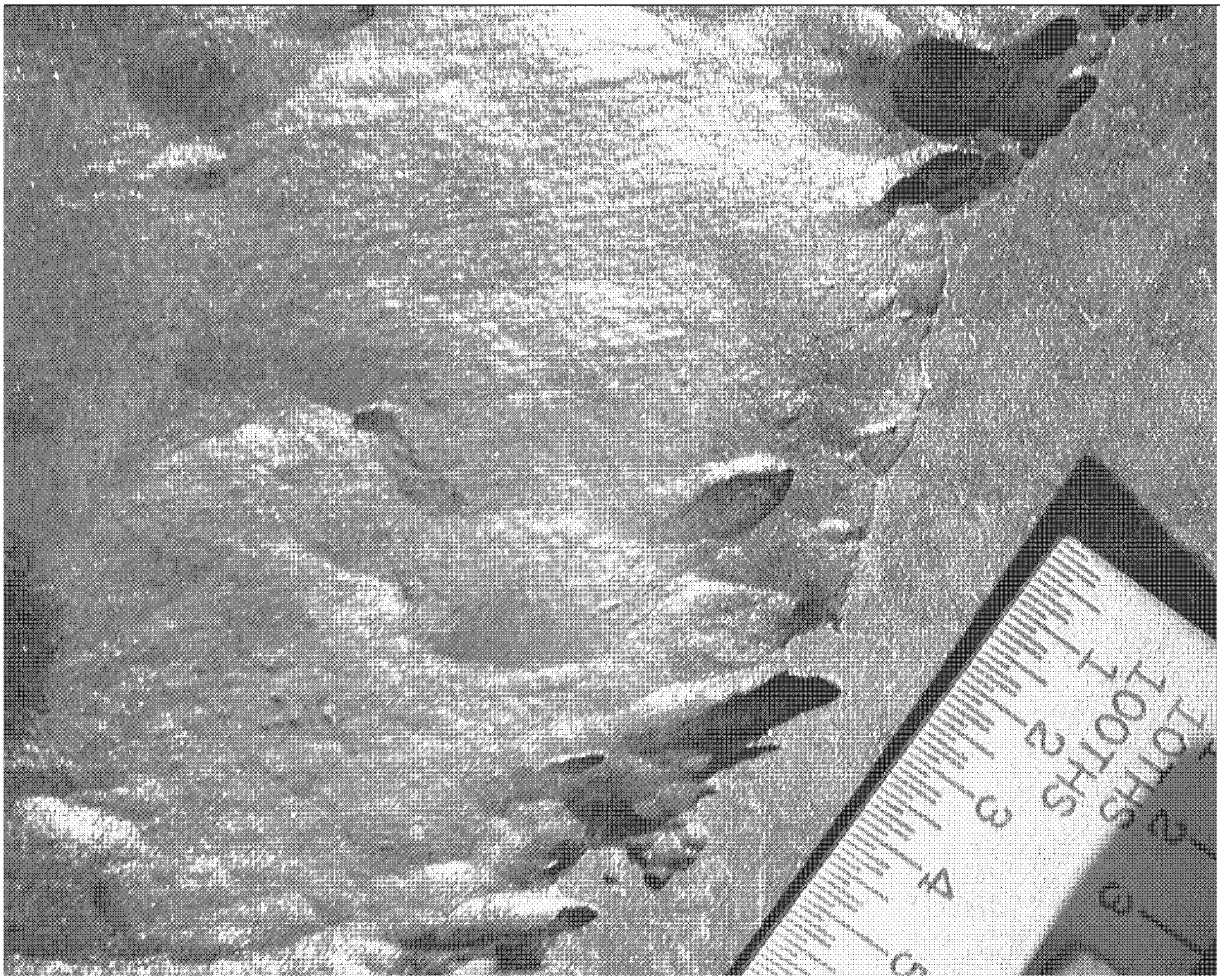


Figure 30 - Detail of previous figure (Area 13). Note steep, undercut edges and relatively smooth bottom.

IPEC00203201

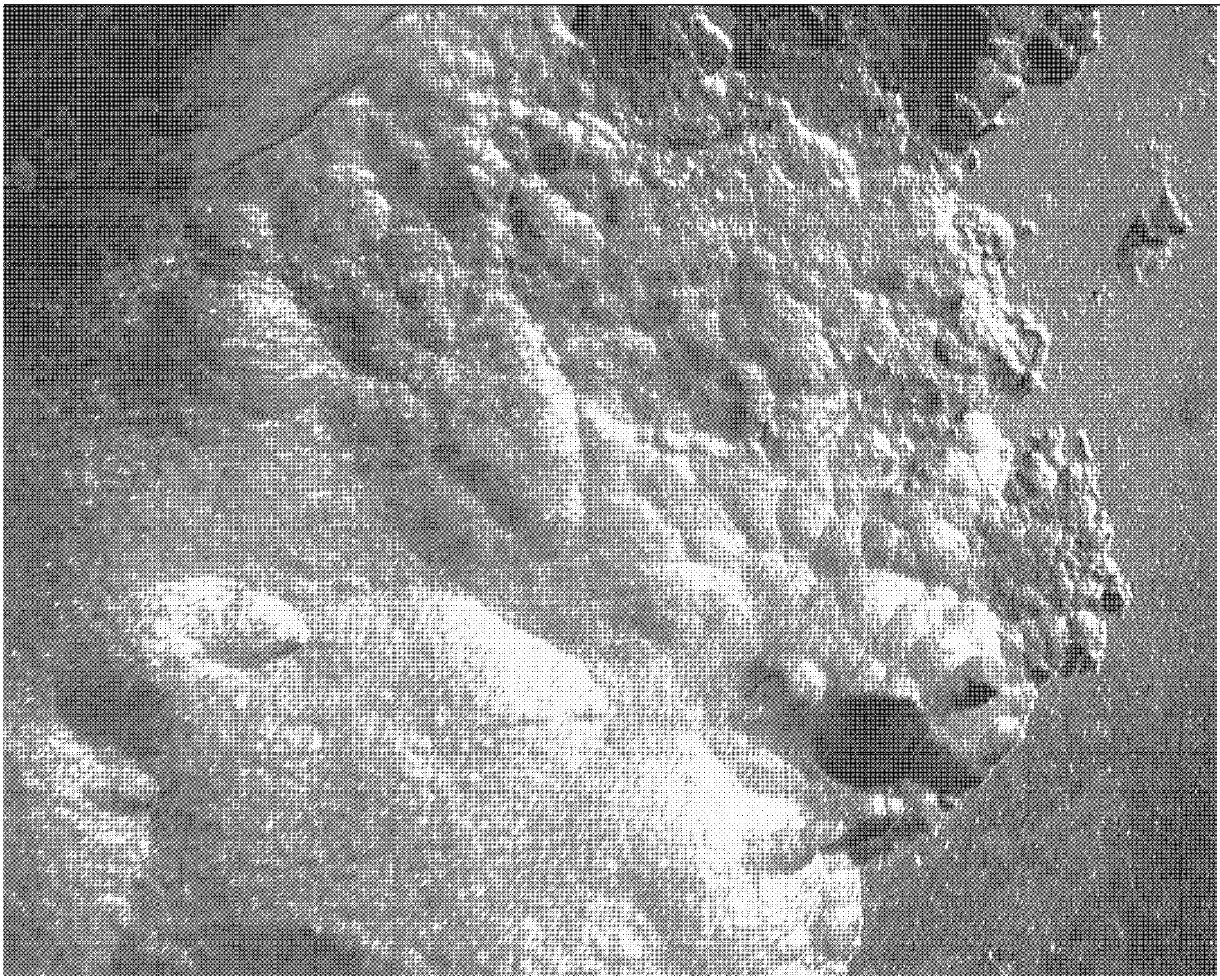


Figure 31 - Detail of cleaned exterior pit in Area 13 Note pit-within-pit morphology in this area of less severe metal loss.

IPEC00203202

Figure 32 - Detail of cleaned pit (Area 13). Note tunneling and striations trending from upper left toward lower right.
Finest divisions on the scale at right are 0.01 inch

IPEC00203203

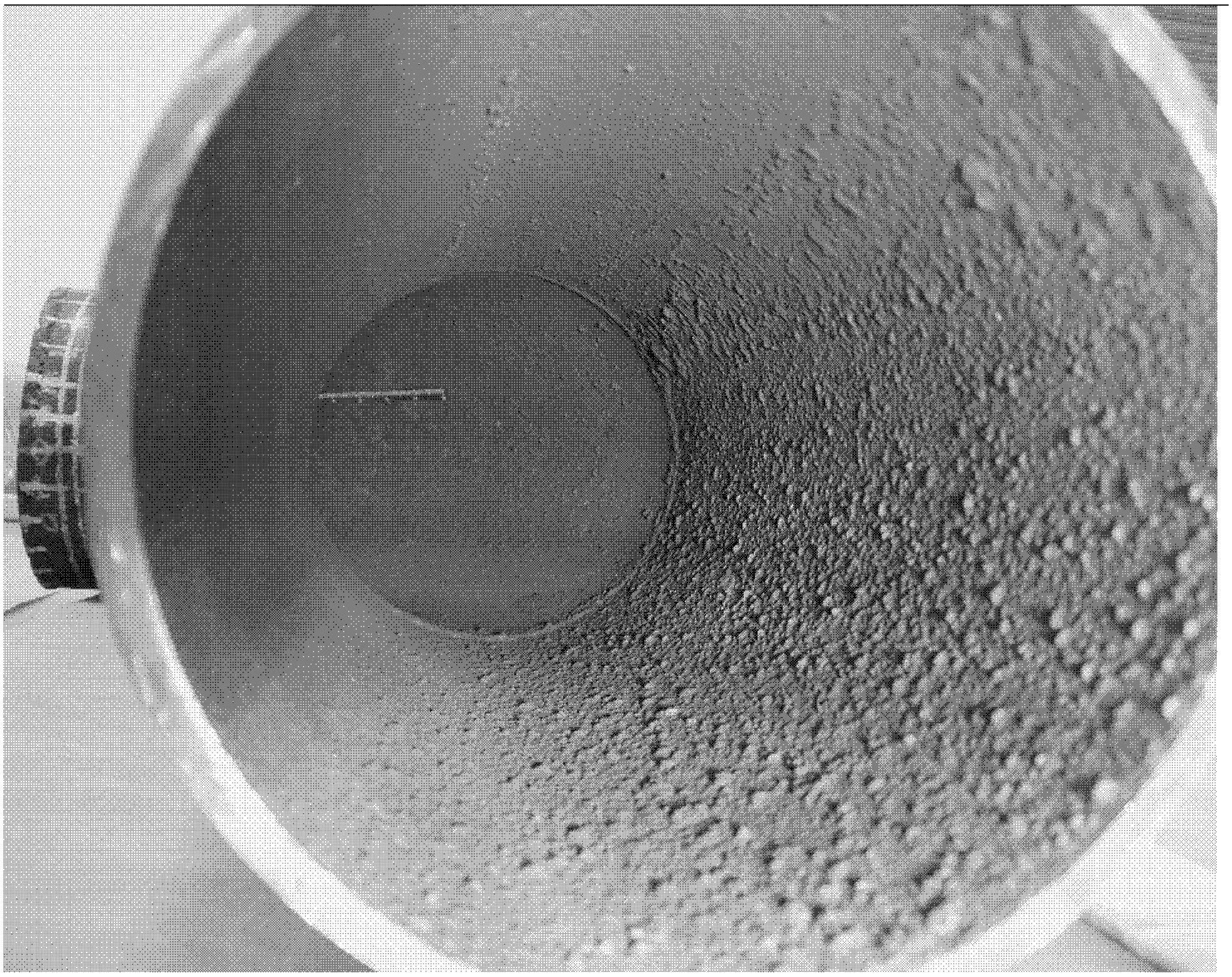


Figure 33 – Inside view of pipe sample looking from straight pipe toward the elbow (as received condition).
Pattern of rust red tubercules was different on the elbow than on the pipe. See following figures for details.

IPEC00203204

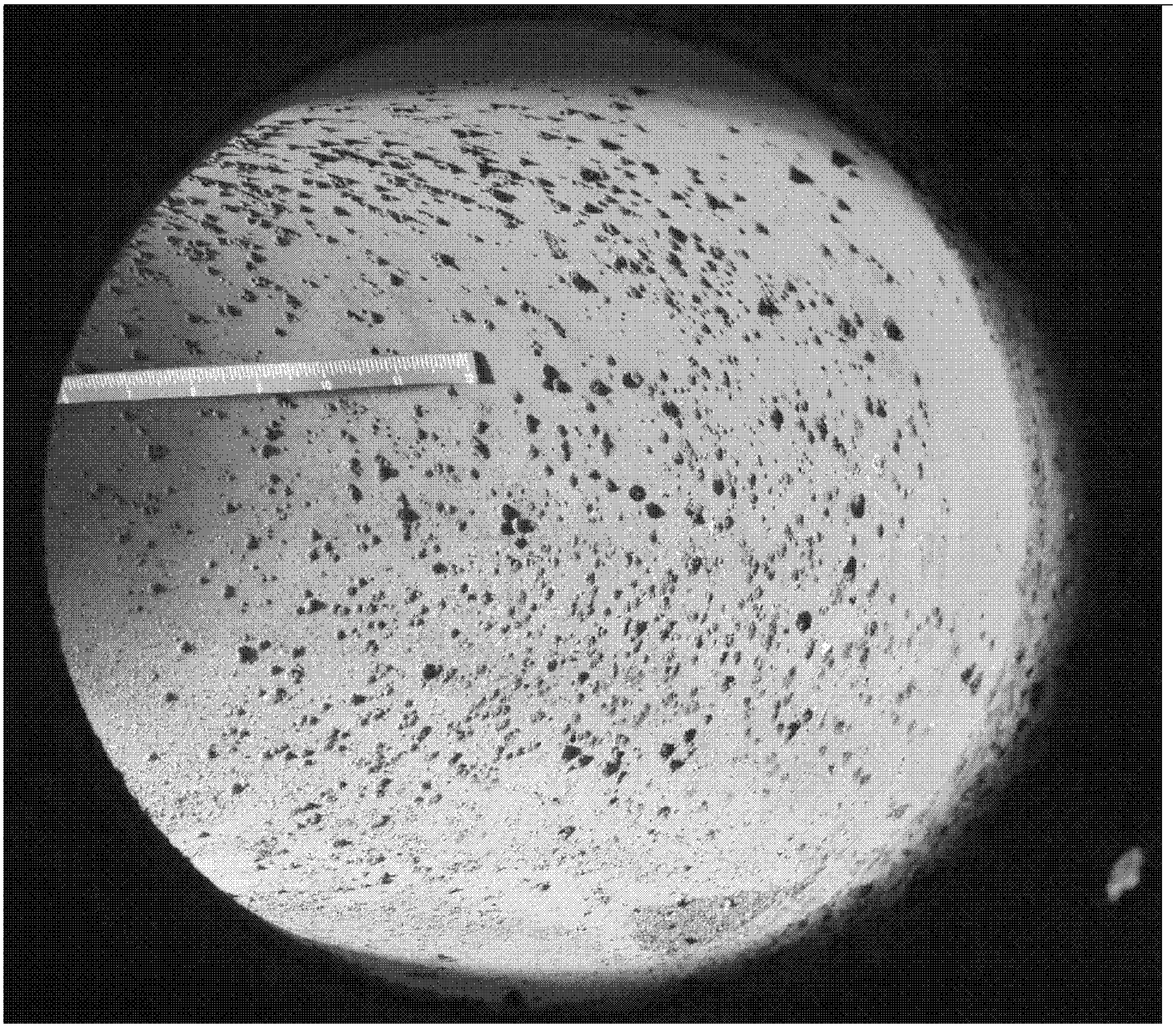


Figure 34 – View into pipe from the end of the elbow.
Note more widely spaced tubercules, relative to those illustrated in the previous figure. Numbered divisions on red scale are inches.

IPEC00203205

Figure 35 – Inside surface near girth weld, after cleaning by glass bead blasting.
Pipe is at right, elbow is at left. Narrow band of corrosion pitting adjacent to the weld is typically related to localized microstructural changes in the weld heat affected zone and to changes in the oxide scale resulting from the thermal cycles associated with welding. In this case the corrosion extends beyond the limits of the microstructural changes and is therefore most likely also influenced by changes in the oxide film on the surface or ..

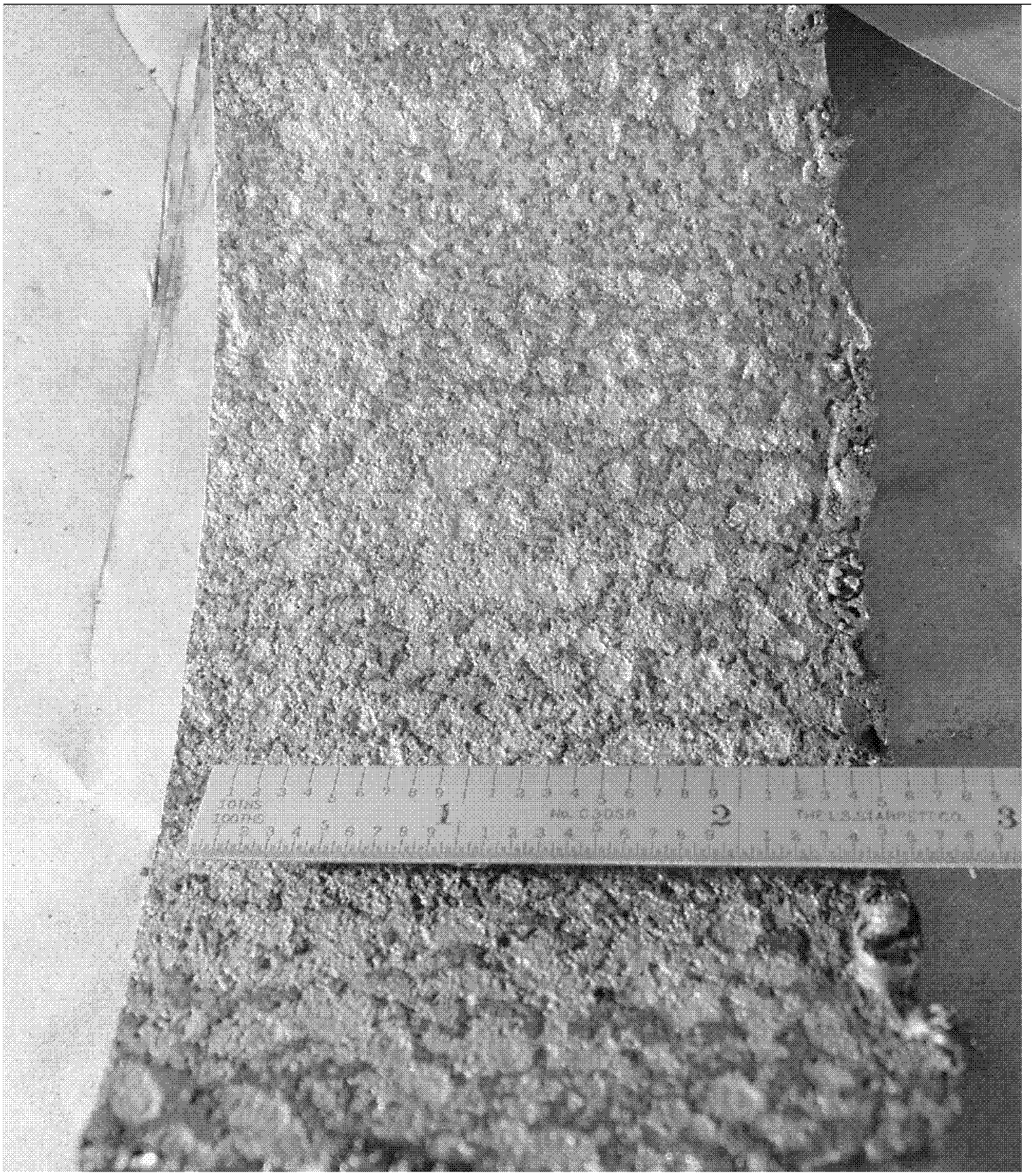


Figure 36 – Inside surface of the pipe after cleaning showing superficial general corrosion.

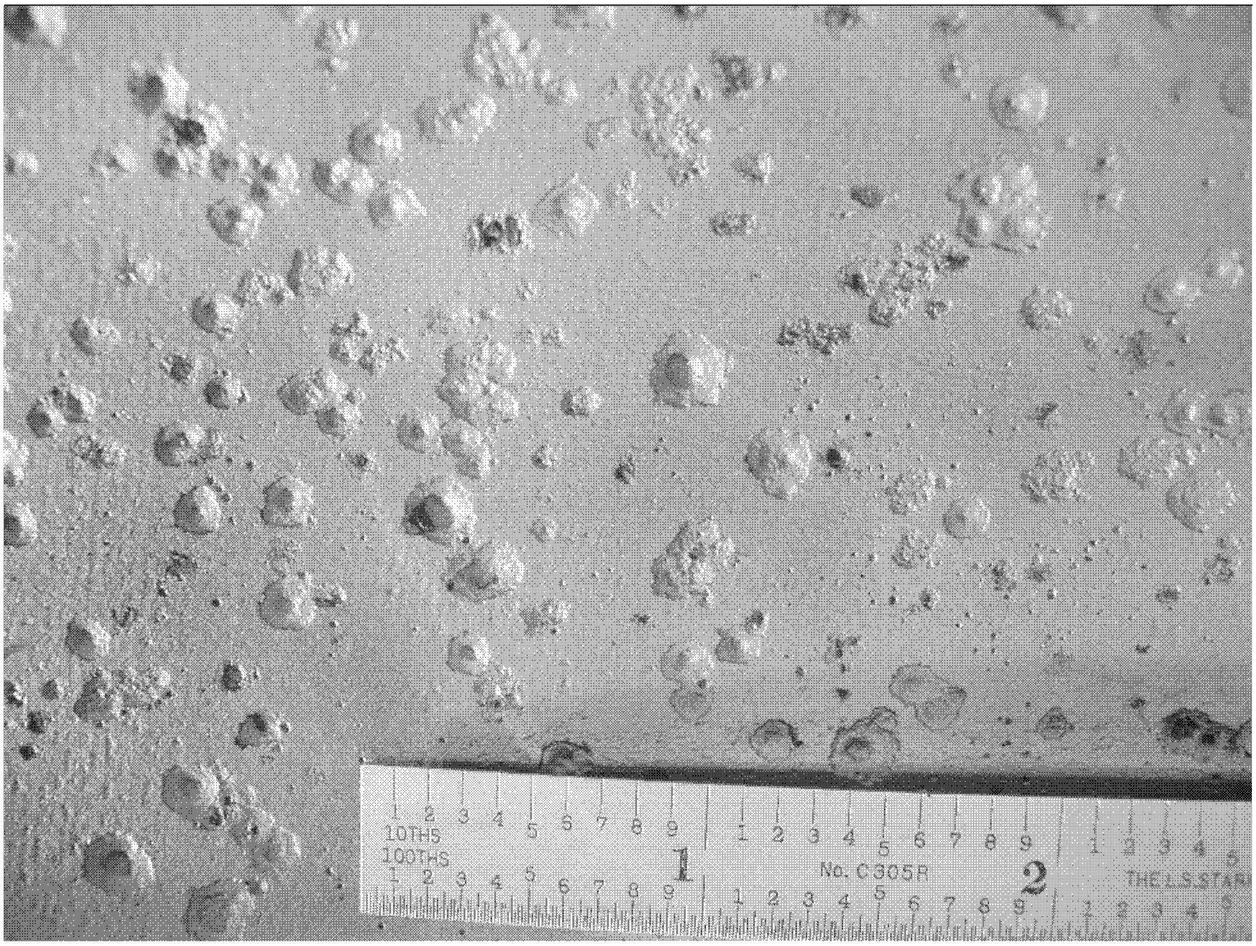


Figure 37 - Detail of the inside surface of the elbow after cleaning.
Maximum measured pit depth is approximately 0.018 inches, corresponding to an average long term corrosion rate of only about 0.5 mpy (1 mpy = 0.001 inch per year, or 1 mil per year).

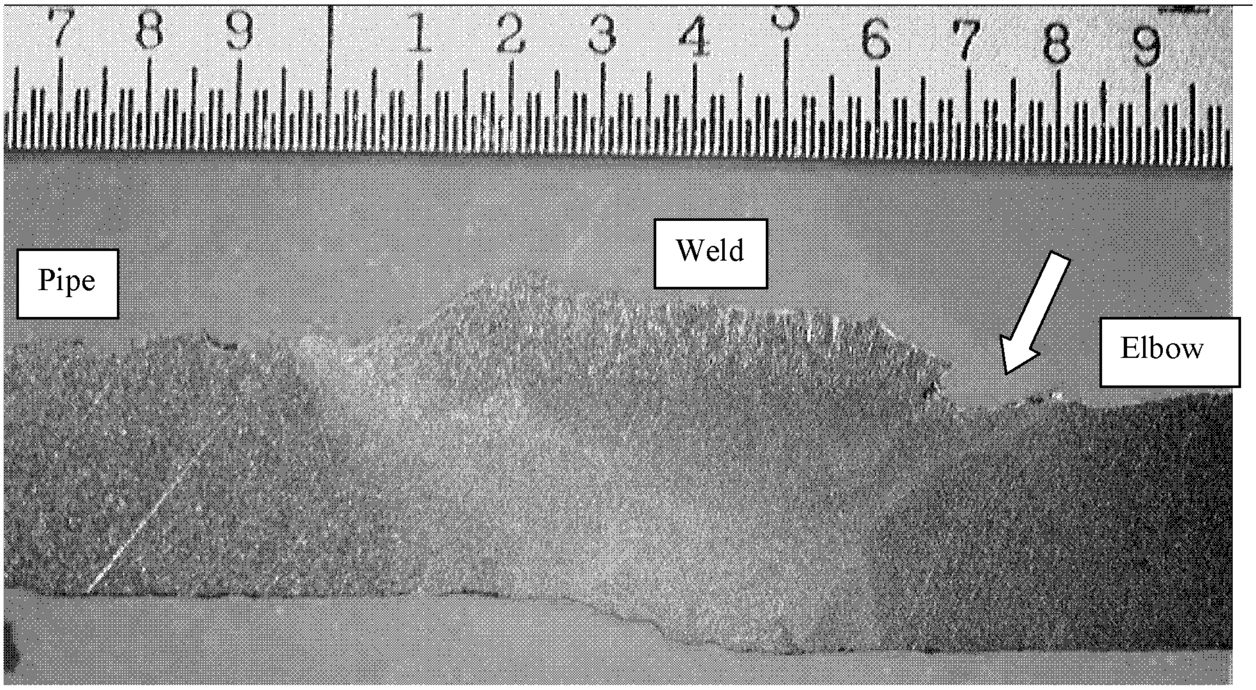


Figure 38 – Polished and etched cross section through area of external corrosion on the girth weld

This is the same location as identified as Area 5 in Figures 21 and 22. The inside surface of the weld is at the bottom of this figure. See the next figure for detail of the area near the arrow. Note that the good workmanship of the weld root pass completely accommodated the slight high-low condition at the inside surface of the joint, resulting in no evidence of any lack of fusion due to high-low.

At this location it is apparent that the corrosion on the inside surface is superficial, with virtually no apparent corrosion on the inside of the elbow. External corrosion has affected both the pipe and the elbow, with the greatest depth of metal loss being located in the elbow heat affected zone. However, the metal loss at that location is no deeper than the metal loss at some other areas of the elbow remote from the weld. Numbered divisions on the scale are 0.1 inch increments.

IPEC00203209

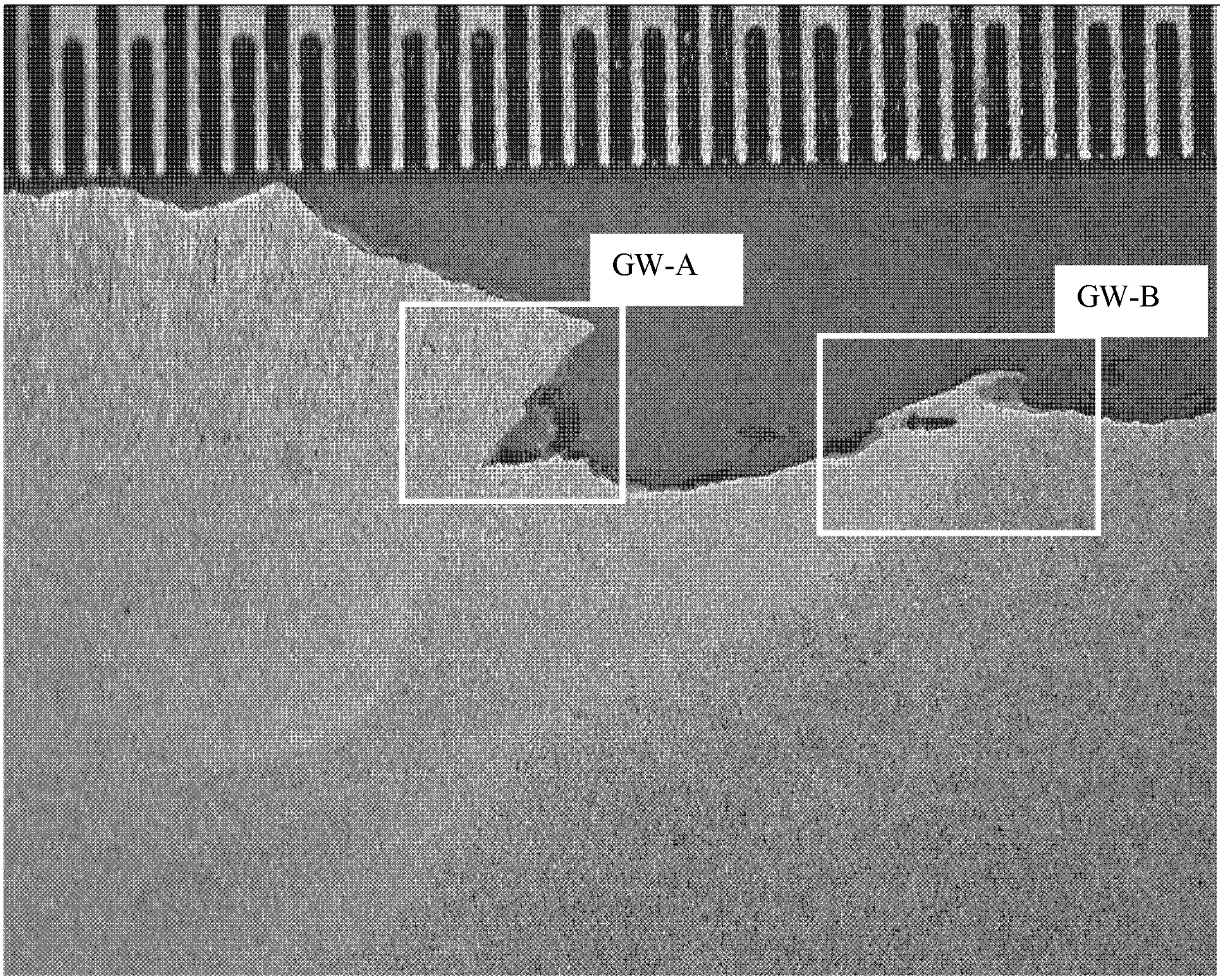


Figure 39 - Detail of previous figure showing areas of corrosion at the outside surface of the pipe.
See following figures for detail of areas GW-A and GW-B. The preferential corrosion of the weld HAZ is clearly evident. Small divisions on the scale are 0.01 inch.

IPEC00203210

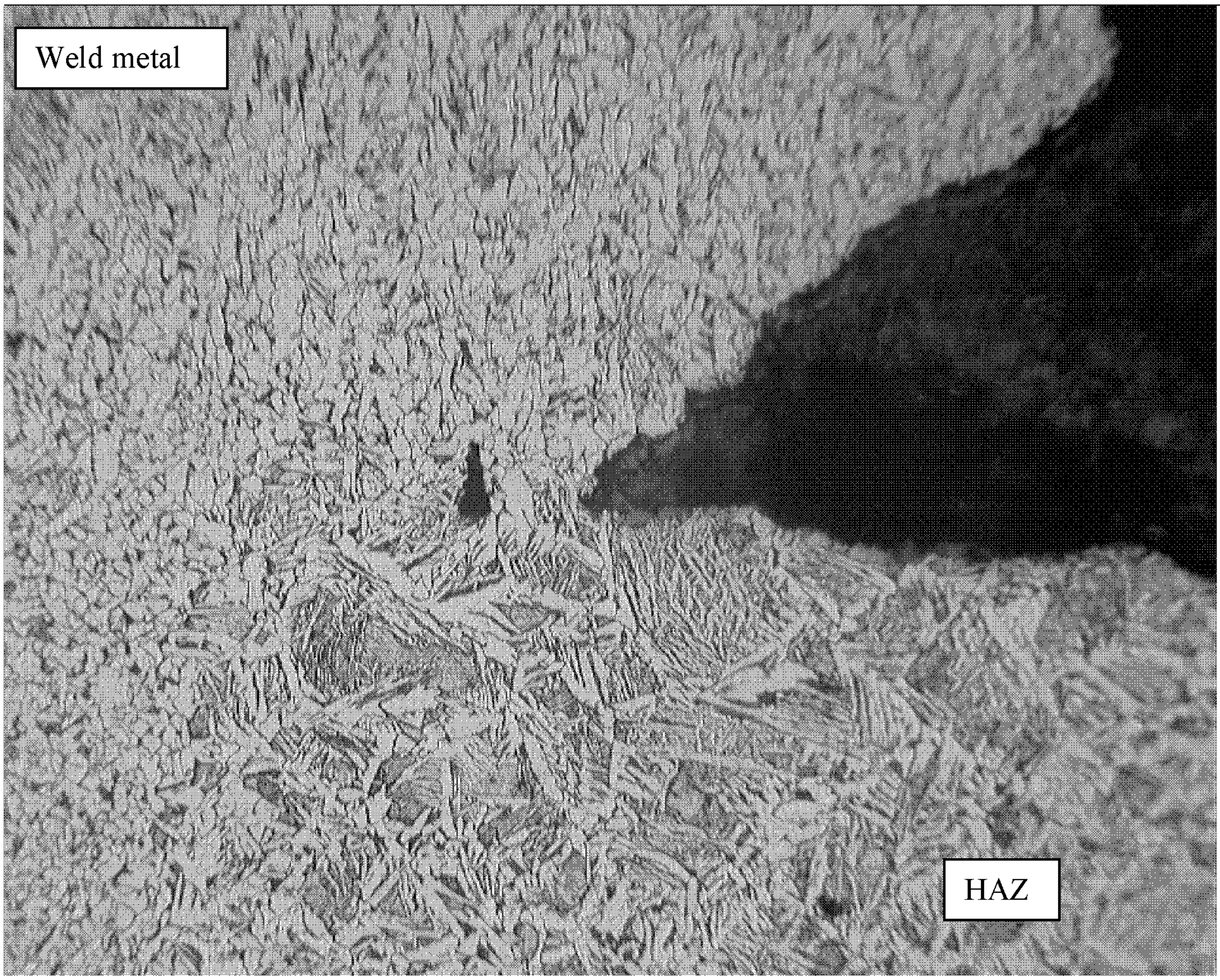


Figure 40 - Detail of previous figure, Area GW-A.
Note preferential corrosion of the heat affected zone, leaving the weld metal standing in relief.

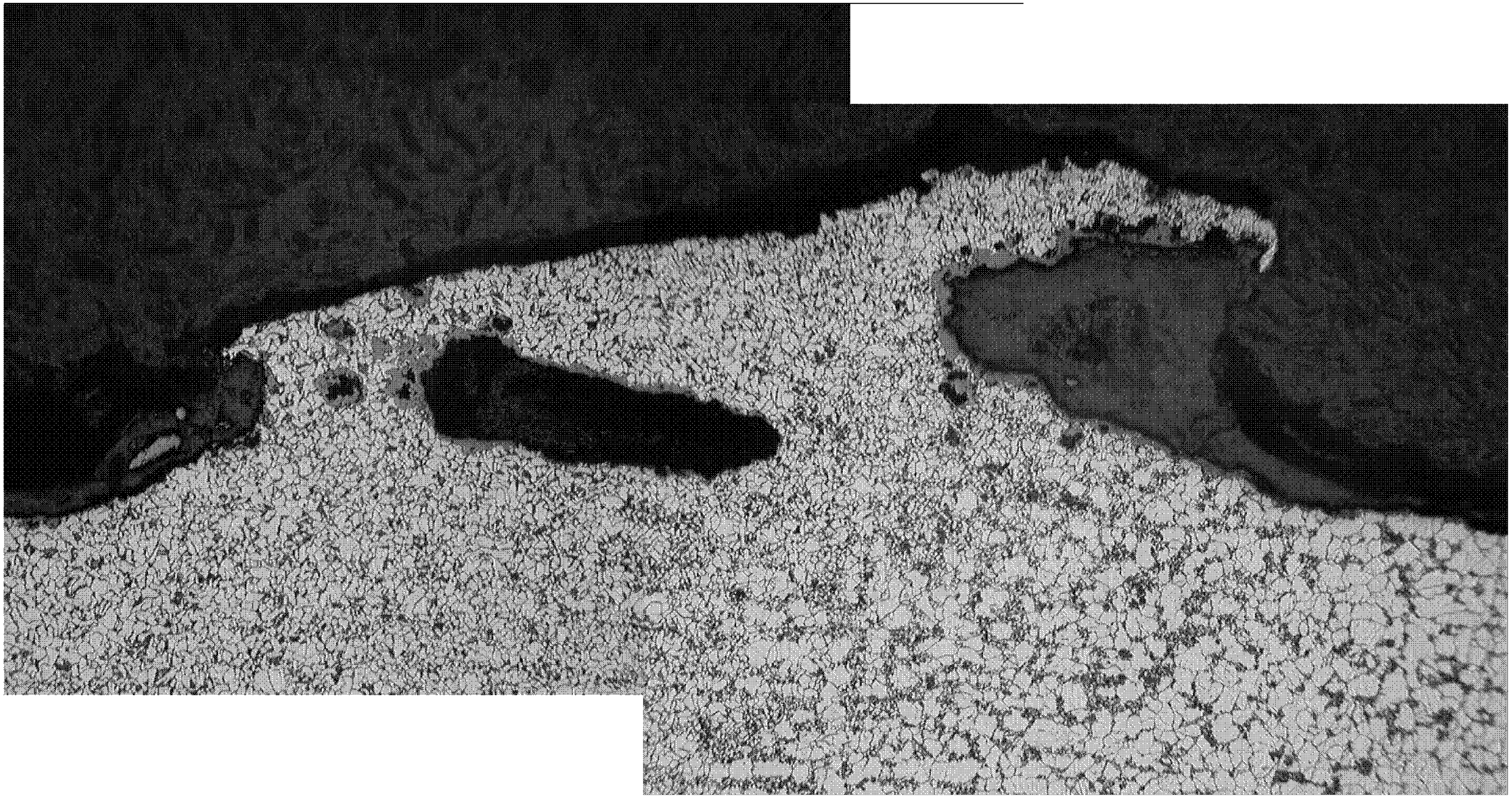


Figure 41 - Detail of cross section through corrosion on the outside surface of the pipe, immediately adjacent to the girth weld (Area GW-B).
Note the irregular profile of the corrosion that is undercutting the surface

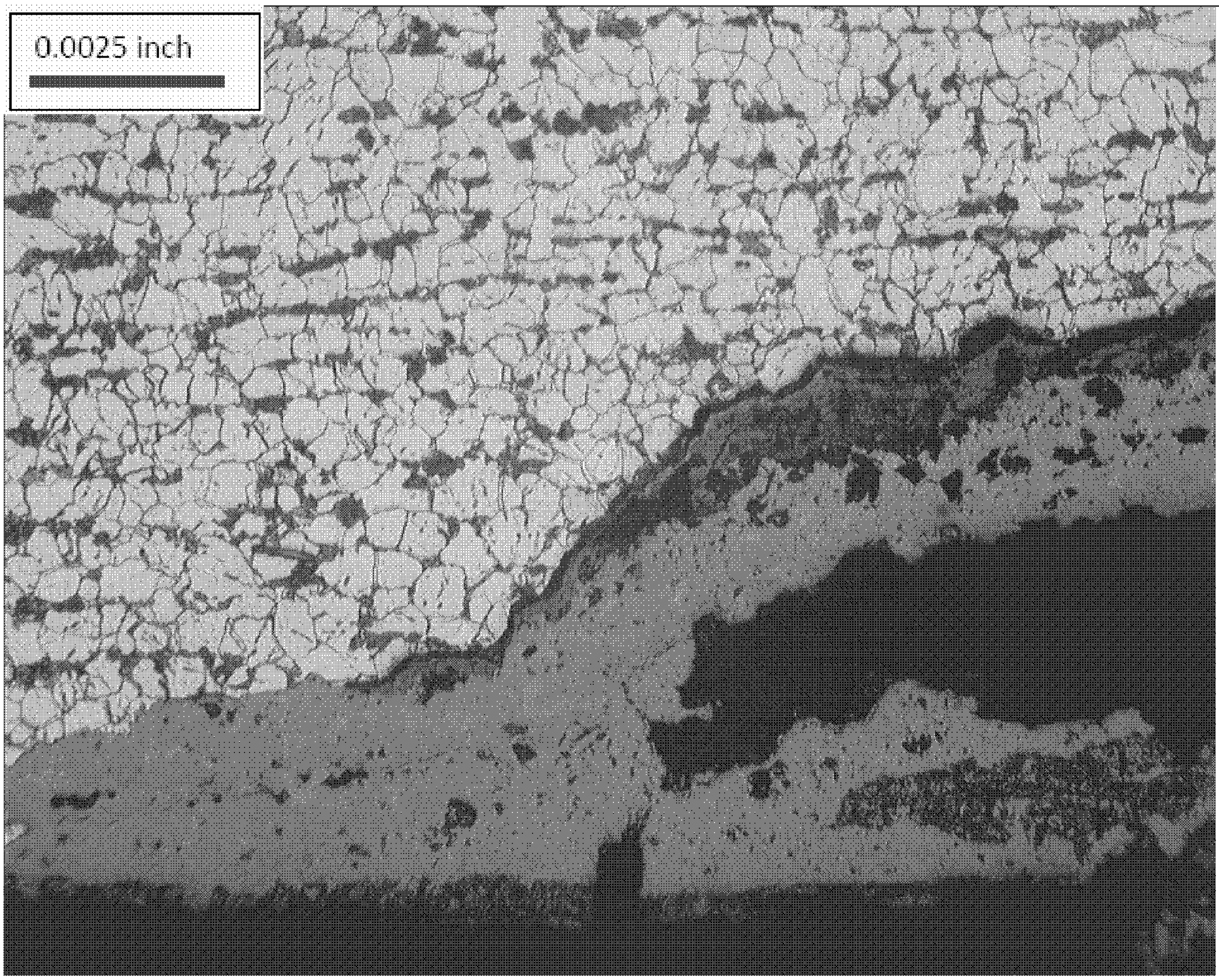


Figure 42 - Microstructure of elbow at ID surface with corrosion product intact (at bottom and lower right).
The microstructure consists of fine pearlite (dark phase) and proeutectoid ferrite (yellow phase), as expected for hot worked steel of this composition

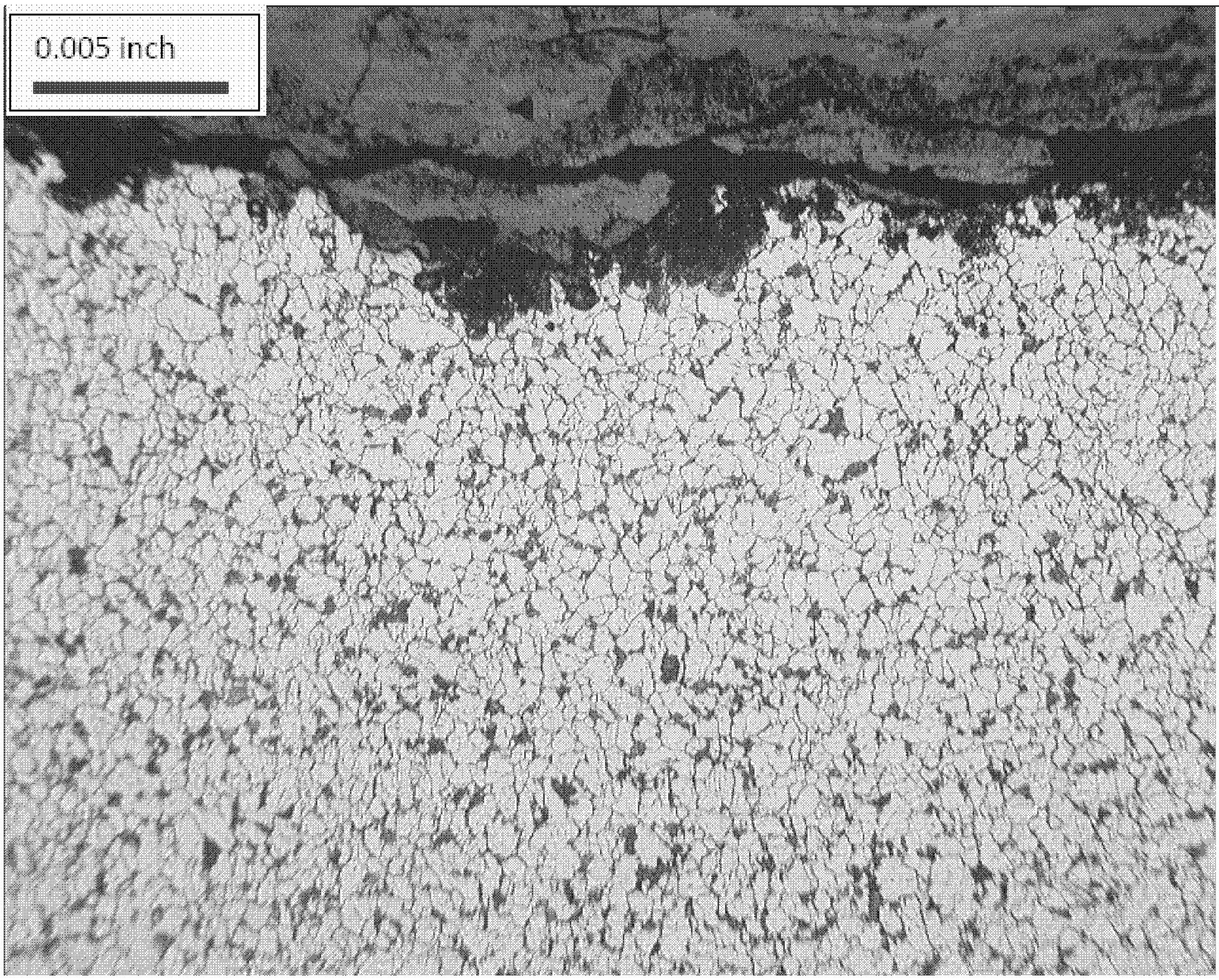


Figure 43 - Microstructure of elbow at outside surface.
The miscrostructure is comparable to that shown in Figure 42

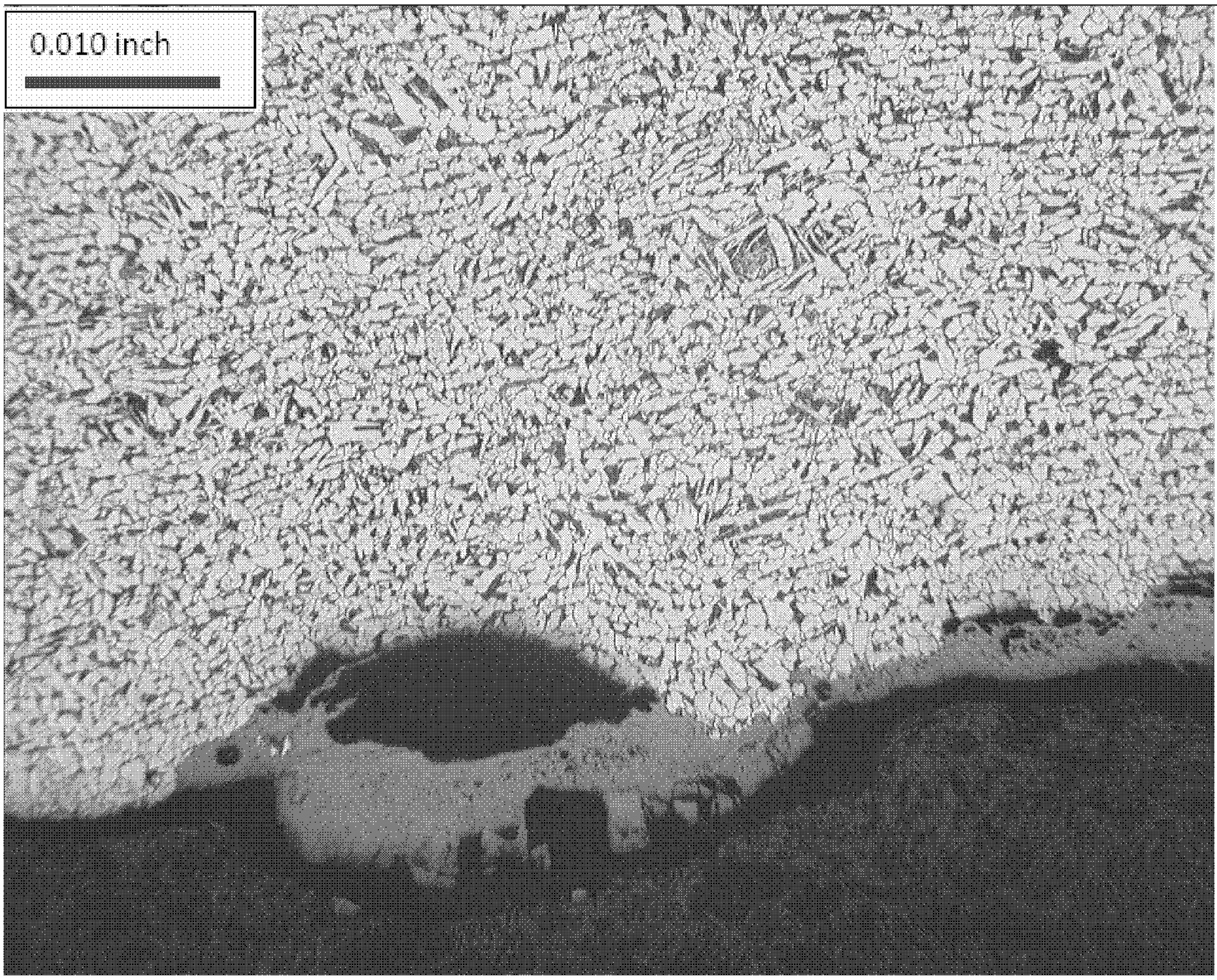


Figure 44 - Microstructure of pipe at inside surface showing blistered corrosion product over a corrosion pit.
The microstructure consists of fine pearlite (dark phase) and proeutectoid ferrite (yellow phase), as expected for hot worked steel of this composition.

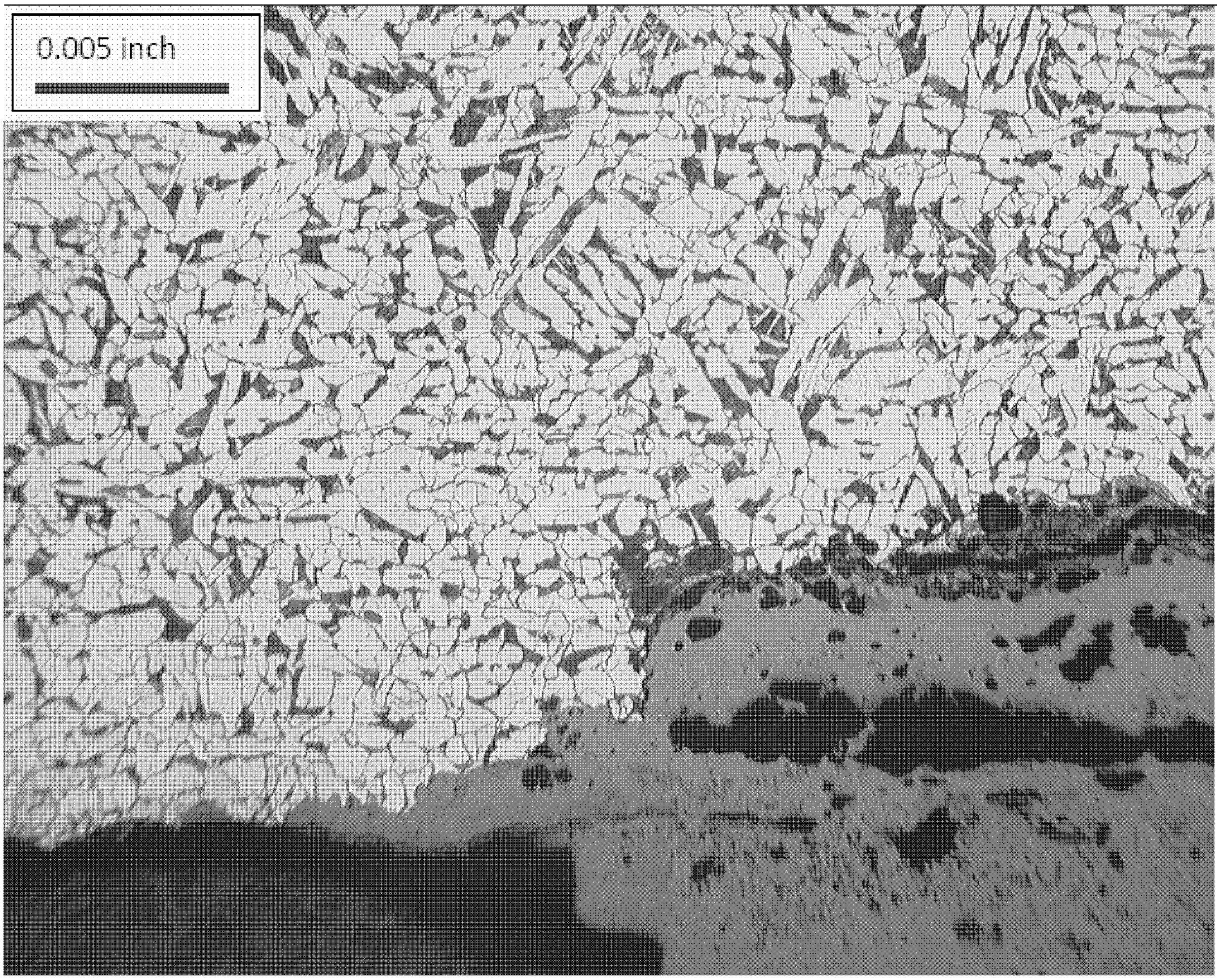


Figure 45 - Detail of pipe microstructure at inside surface.
Corrosion product is present at the lower right.

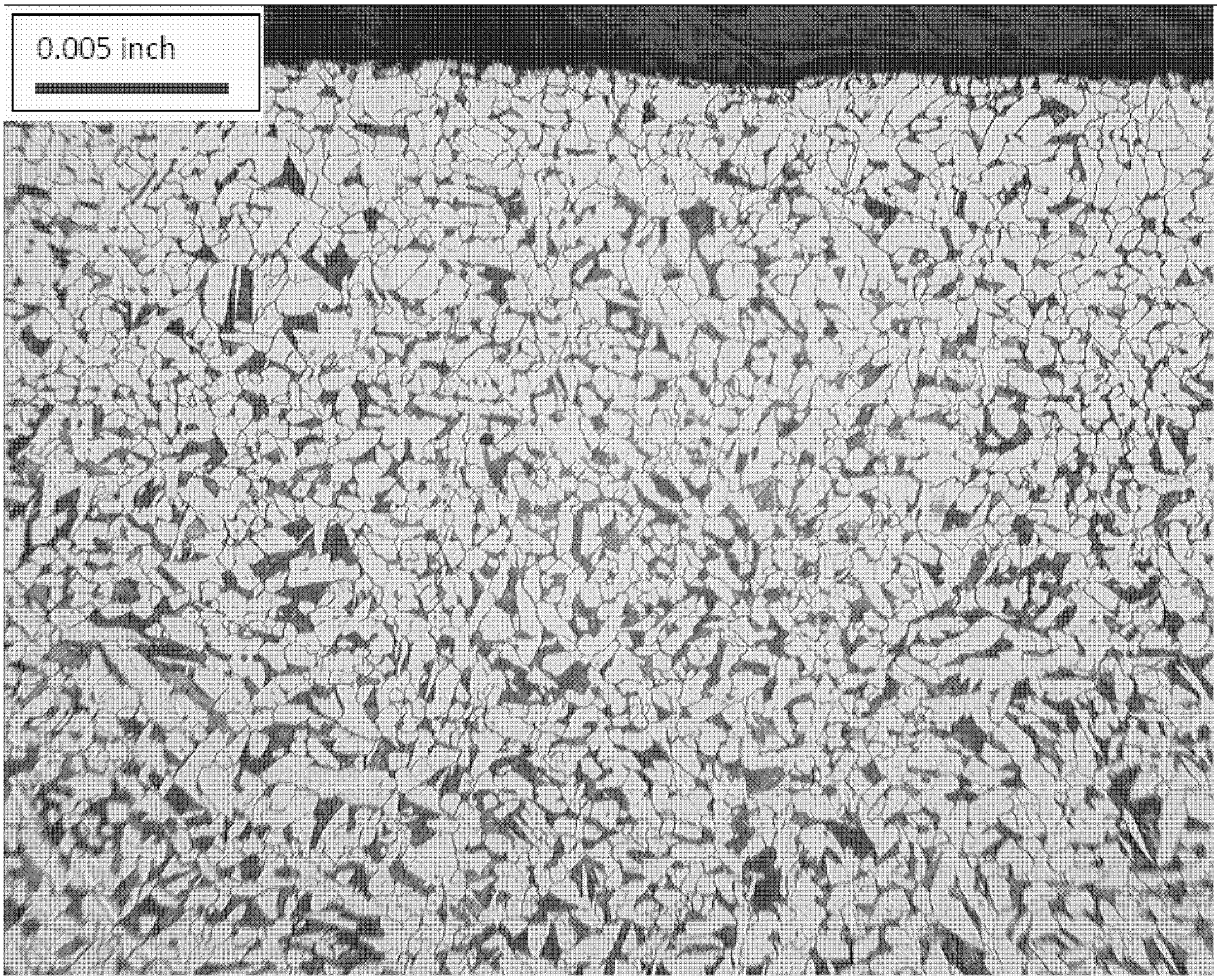


Figure 46 - Microstructure of pipe at outside surface.
There is no external corrosion at this location. The outside surface is at the top of the figure.

IPEC00203217

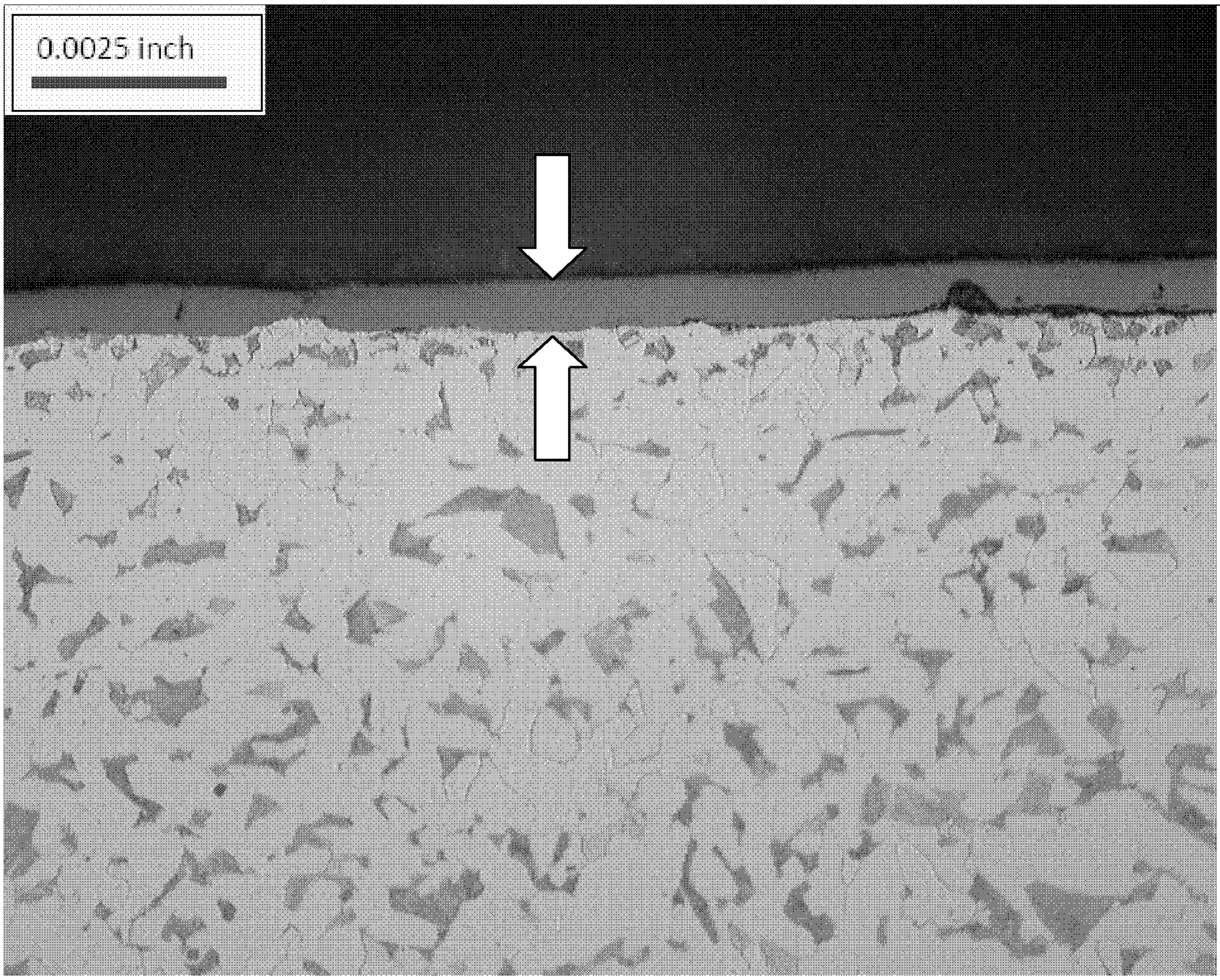


Figure 47 - Cross section through the pipe immediately adjacent to an external corrosion pit showing intact mill scale (between arrows)

The presence of intact mill scale indicates that there was no corrosion on this surface and that there was no surface preparation prior to external coating. A small amount of decarburization of the surface is present, as expected for this type of steel product.

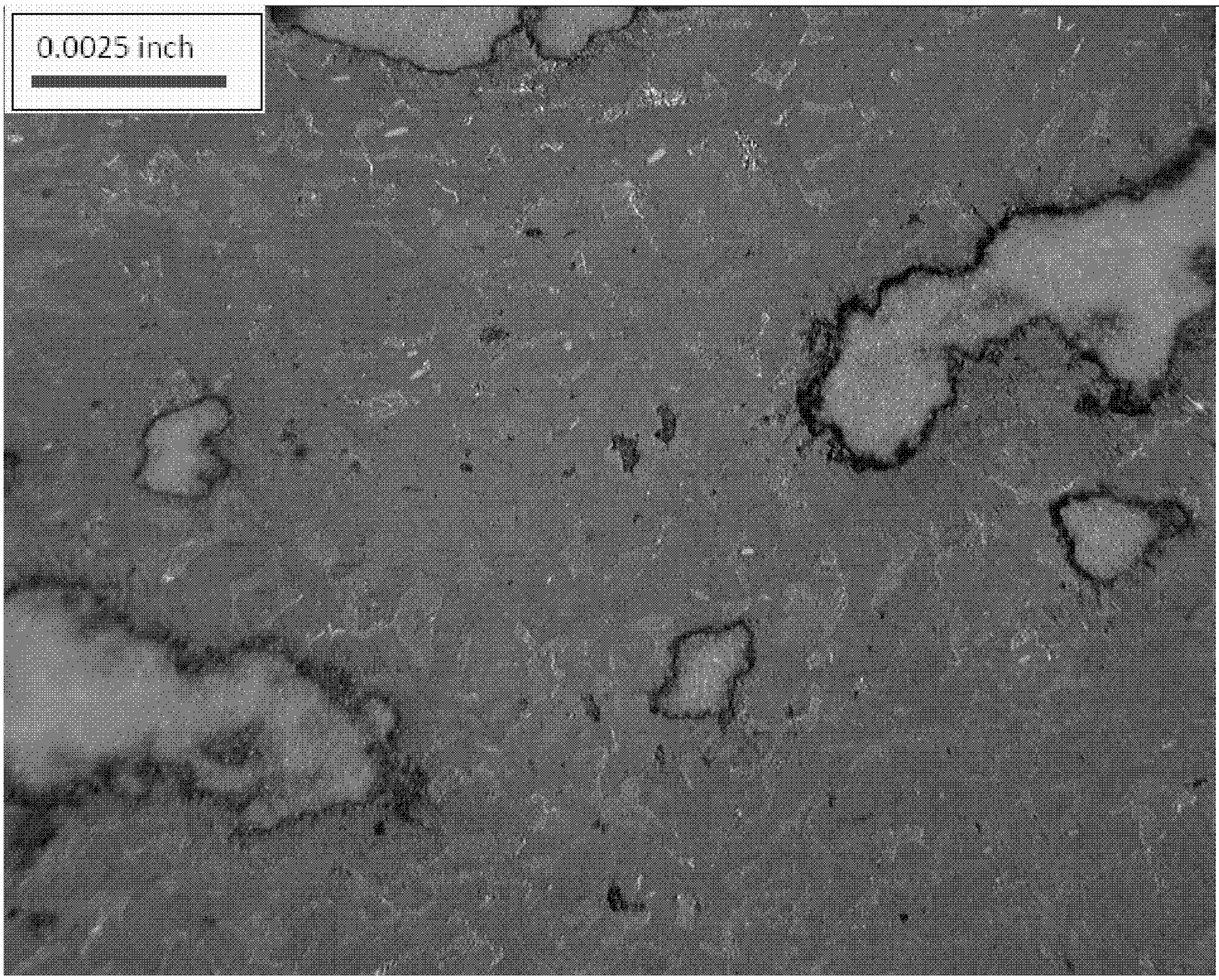


Figure 48- Detail of corrosion product in a pit on the outside of the pipe
The corrosion has preferentially corroded the proeutectoid ferrite and the ferrite lamellae of the pearlite leaving the iron carbide constituent of the pearlite grains uncorroded. The resulting shiny irregular globular-shaped areas replicate in the corrosion product the size and shape of the original pearlite grains. This appearance is typical of iron carbonate corrosion products.

IPEC00203219

Table 4 – Ultrasonic Thickness Measurements (inches)

Specified nominal wall thickness = 0.322 inch

Location Per Entergy Grid (note 1)			SI Data	Corresponding Entergy Data
Row	Row	Column		
Pipe	A	1	0.296	0.298
Pipe	D	3	0.300	0.303
Pipe	G	5	0.310	0.304
Pipe	M	6	0.319	0.321
Pipe	S	2	0.317	0.317
Pipe	V	4	0.322	0.322
Pipe	Z	1	0.290	0.278
Pipe	AA	6	0.311	0.312
Elbow	AA	1	0.363	0.368
Elbow	C	7	0.358	0.353
Elbow	F	4	0.339	0.330
Elbow	J	2	0.324	0.321
Elbow	O	6	0.334	0.333
Elbow	S	3	0.351	0.350
Elbow	W	5	0.388	0.384
Elbow	Z	3	0.350	0.354

Location (2-inch Circumferential Increments)	~1 inch From End of Pipe	~1 inch From Girth Weld, on Pipe Side	~1 inch From Girth Weld, on Elbow Side,	~1 inch From End of Elbow
1	0.301	0.290	0.359	0.385
2	0.328	0.290	0.353	0.340
3	0.327	0.311	0.341	0.346
4	0.330	0.316	0.328	0.335
5	0.337	0.324	0.331	
6	0.315	0.334	0.320	0.314
7	0.308	0.345	0.322	0.323
8	0.311	0.343	0.327	0.329
9	0.294	0.326	0.335	
10	0.290	0.327	0.330	
11		0.319	0.341	
12		0.304	0.357	

Note 1: Measurements by SI at grid locations were made approximately at the intersection of the grid lines. Small differences in measurements between SI and Entergy data may reflect small variations in the location of the transducers during measurements.

IPEC00203220

Table 5 - Chemical Composition of Pipe and Elbow

Element	Pipe, location 1 (%)	Pipe, location 2 (%)	Spec. ASTM A106 Gr. B (%)	Elbow (%)	Spec. ASTM A234 WPB (%)
Carbon	0.20	0.23	0.30 max	0.18	0.30 max
Manganese	0.67	0.69	0.29-1.06	0.62	0.29-1.06
Phosphorous	0.008	0.008	0.025 max	0.007	0.050 max
Sulfur	0.016	0.020	0.025 max	0.12	0.058 max
Silicon	0.02	0.02	0.10 min	0.18	0.10 min
Nickel	0.01	0.01	0.40 max	0.01	NA
Chromium	0.06	0.06	0.40 max	0.01	NA
Molybdenum	0.01	0.02	0.15 max	0.02	NA
Copper	0.02	0.02	0.4 max	0.01	NA
Aluminum	<0.01	<0.01	NA	<0.01	NA

Note: Specifications limits are per ASTM Volume 01.01, 1991 and may not be the same as the requirements that were in effect at the time of construction.

Table 6 - Mechanical Properties of Pipe and Elbow

Property	Pipe, location 1	Pipe location 2	ASTM A106 Gr. B	Elbow	ASTM A234 WPB
0.2% offset Yield Strength (ksi)	43.5	42.3	35.0 min.	39.5	35.0 min
Ultimate Tensile Strength (ksi)	65.8	66.9	60.0 min	62.1	60.0-85.0
% Elongation	31.2	35.8	26.5 min	35.1	20 min
% Reduction of Area	52.6	54.7	NA	54.6	NA

IPEC00203221

Table 7 - Results of XRD Analysis of Corrosion Products

Sample	Fe_3O_4 Magne i e*	α-Fe_2O_3 hema i e	α-FeOOH goe hi e	γ-FeOOH le idoc oci e	$FeCO_3$ ide i e	$Fe_2(OH)_2CO_3$
Inside corrosion	~70 wt%	~5 wt%	~15 wt%	~5 wt%	~5 wt%	~5 wt%
Outside corrosion					Major	Minor

*most likely combined with maghemite γ-Fe_2O_3 (=decomposed magnetite)

Table 8 - Results of EDS Analysis of Outside Surface Corrosion Products

Element	Concentration in Bulk Deposit	Concentration at Interface with Steel	Units
O	32.2	30.2	wt.%
Si	1.2	0.2	wt.%
S	0.6	0.4	wt.%
Cl	0.1	ND	wt.%
Cr	0.2	0.1	wt.%
Mn	0.3	0.5	wt.%
Fe	60.7	64.4	wt.%

Table 9 – Typical Results of EDS Analysis of Inside Surface Corrosion

Element	Bulk Deposit Location 1	Bulk Deposit Location 2	Steel Interface Location 1	Steel Interface Location 2	Units
O	30	26.1	24.7	31.3	wt.%
Al	0.1	0.2			wt.%
Si	0.7	1.2	0.6	0.8	wt.%
P	0.2	0.12			wt.%
S	0.1	0.2	0.3	0.6	wt.%
Cl	0.1			0.7	wt.%
Cr	0.5	0.2		0.2	wt.%
Mn	0.2	0.3	0.3	0.2	wt.%
Fe	58.4	66.5	68.0	60.1	wt.%
Ni	0.2				wt.%
Cu	0.4	0.3			wt.%

IPEC00203222

Summary

The leak in the 8” steel condensate piping was caused by external corrosion. Corrosion on the exterior of the pipe consisted of a large number of localized pits, rather than of widespread general corrosion. The surfaces around the pits on the straight pipe had no evidence at all of corrosion and the original mill scale (high temperature iron oxide) was intact, indicating that where the coating remains intact the pipe surfaces are adequately protected against corrosion. The external surfaces of the elbow had more widespread corrosion, although a few portions (less than half of the surface) still showed no evidence of external corrosion. The patterns of corrosion on the pipe are consistent with localized mechanical damage to the coating. The corrosion on the elbow was consistent with an imperfect coating resulting from the difficulties inherent in coating an irregular surface such as the elbow.

During and after the excavation process, Entergy staff observed that the backfill in the area of the pipe included debris and angular rocks. Those materials could have damaged the coating in multiple locations during the pipe installation or backfilling process, resulting in vulnerability of the small areas of exposed steel to corrosion. Since a relatively large surface area of the sample has no evidence of corrosion, exposure to leaking water or to water-saturated soil apparently did not have a significant effect on the protectiveness of the coating on the pipe. Rather, the large number of observed pits is more likely related to the occurrence of coating damage that occurred during installation; not to gradual or long term coating degradation that could potentially as a result of exposure to leaking water or water-saturated soil.

While the morphology of the external pitting included features that are typical of corrosion associated with MIC, the features are not unique to MIC. Likewise, the corrosion products in the external corrosion pits consisted primarily of siderite (iron carbonate), which can result from either MIC or from corrosion unrelated to microbiological activity (i.e., from abiotic corrosion). The siderite corrosion product can be formed either by MIC, or can be generated as a result of electrochemical corrosion of steel exposed to well buffered water containing little or no oxygen, a neutral to moderately high pH, and low calcium. The reported pH of the ground water matches this requirement. The available water analysis and soil analysis does not contain the information required to determine if the other attributes are within the range for siderite to be formed abiotically.

We determined that the corrosion rate responsible for causing the leak must have been at least 8 mpy (0.008 inches per year or 8 mils per year) to cause penetration of the pipe wall in about 40 years. Many soils could cause a long term corrosion rate of about 8 mpy or higher in the absence of MIC, so the high corrosion rates often associated with MIC are not necessary to cause the leakage. It is likely that the corrosion progressed discontinuously as water table levels rose and fell, or as the soil environment underwent other seasonal or temporary changes. As a result, the peak corrosion rate could have been significantly higher than 8 mpy and within the range associated with MIC. However, it is apparent that if MIC did contribute to the metal loss, it was not active the entire time the pipe was in service because the leak would have occurred much sooner.

Determining the probable rate of future metal loss at other locations of coating damage on this piping would require either directly measuring the rate with corrosion probes or buried coupons, or modeling the likely abiotic corrosion rates using soil analysis data. Insufficient soil data

IPEC00203223

currently exists to estimate the corrosion rate that could be caused by the backfill in the absence of MIC.

Some preferential corrosion of the girth weld heat affected zone was apparent on both the ID and OD of the pipe, but the maximum depth of metal loss in the HAZ was no greater than the maximum depth of metal loss remote from the weld.

Corrosion on the inside surface of the sample was superficial and does not represent a significant threat to the integrity of the pipe. ID corrosion on the straight pipe was more widespread than in the elbow, resulting in an appearance more typical of general corrosion, rather than of pitting. ID pitting on the elbow consisted of individual small pits. The composition of the corrosion products from the inside of the sample was characteristic of corrosion by low oxygen content water and was significantly different from corrosion products on the OD of the pipe.

The metallurgical characteristics of the pipe, elbow, and girth welds were normal. The workmanship of the weld was good. No abnormalities in the steel or weld were present that could have contributed significantly to the corrosion, although the pipe composition deviated from the ASTM A106 specification with regard to silicon content. The composition did meet the requirements for comparable seamless pipe specifications.

Conclusions

1. Internal corrosion is present, but it is superficial and does not represent a threat to the operation of the piping. Minor differences in the extent of corrosion observed on the pipe and on the elbow are attributed to minor differences in the steel composition. The weld HAZ of the elbow appeared be to somewhat less resistant to corrosion than the areas of ethe elbow away from the weld, but no less resistant than the pipe.
2. We found no evidence of abnormalities in the metallurgical characteristics of the pipe, elbow, or the girth weld that would have contributed to the observed corrosion. The workmanship of the girth weld was very good. A minor variance in the chemical composition of the pipe from the applicable specification is inconsequential to its performance.
3. The coating quality could not be determined directly from the pipe samples submitted for analysis since the coating had been previously removed during the pipe repair process. However, the observed patterns of corrosion indicate that the coating continues to be protective where it is intact, but the existing coating quality may be somewhat lower on surfaces that are more difficult to wrap, such as fittings, as evidenced by larger areas of general corrosion on the surface of the elbow. The primary cause of localized pitting corrosion in areas surrounded by coating that appears to be generally intact is probably localized mechanical damage to the coating. The mechanical damage causes localized penetrations of the coating resulting in exposure of small areas of the steel surface to the soil environment. The coating damage most likely occurred during installation as a result of using backfill that contained angular rocks and debris. The calculated minimum average long term corrosion rate (about 8 mpy) that would have produced the recent leak is within the range of corrosion rates observed for pipe that is not cathodically protected when exposed to some soils, but lower than expected for MIC if the MIC mechanism was continuously active. Some soil analysis data was provided to SI, but not all of the

IPEC00203224

attributes required for input into our SoilPro model were included in the available data. As a result, we are unable to determine if the soil characteristics at this leak site would be expected to cause an 8 mpy corrosion rate in the absence of MIC. The potential influence of MIC should not be disregarded since both the morphology of the metal loss and the type of external corrosion product present can be related to MIC, (although neither one is a definitive indicator of MIC). Two scenarios could describe the cause of the relatively low average corrosion rate in the presence of a MIC mechanism. First, it is possible that corrosion rates fluctuated during the time of service as water table depths rose and fell, resulting in periodic variations in soil properties. Those variations in soil properties could alternatively support or fail to support a MIC mechanism. In a second scenario, the initial corrosion rate could have been low and unrelated to MIC. After some time in service some environmental change occurred, such as a long term change in the water table, or a leak in adjacent piping. That transition could have triggered the onset of long term MIC (or of higher abiotic corrosion rates). Either case describes how the significantly higher corrosion rates often associated with MIC could have occurred only during a portion of the total service time.

Recommendations

1. Generalizations regarding what constitutes "corrosive soil" can be misleading, particularly when based on assessment of one or only a few soil parameters. Consider installing corrosion probes or corrosion coupons in the backfill with the means to monitor or retrieve the assemblies. Coupons or probes can help quantify corrosion rates, detect transients in corrosion rates, and assist in the determination of the mechanism of corrosion. Alternatively, if available, an additional soil sample could be analyzed to determine the attributes needed to run the SI SoilPro program and estimate the likely pitting rate that would be expected at the location of the sample. However, the SoilPro data will represent the snapshot in time at which the sample was obtained and will not address seasonal changes or transient conditions in the environment unless additional samples are taken at a later time

2. Consider focusing any future piping inspection on areas containing:
   a. Elbows and other harder to wrap fittings since those are preferential locations for coating anomalies.
   b. Backfill suspected of having the same characteristics at those observed at this leak since angular rocks may have caused coating damage at which corrosion can occur
   c. Areas where results of soil analyses indicate that corrosion rates may be the highest. In the absence of data that is sufficient to run the SI SoilPro corrosion rate model , select areas of lowest elevation and low resistivity since low resistivity is often associated with more corrosive soil. Note however that high resistivity soil may still be corrosive.

IPEC00203225

d.

Appendix A – Observations by Entergy Engineering Staff Regarding the Excavation Conditions

Observation 1

- The initiating event was a report by Operations that the water level was rising in the sleeve of the 8" Condensate Return line in the Aux Feed Pump Room where the pipe goes into the floor
- On his own initiative, an Operator looked in the manhole just outside the Aux Feed Pump Room in the Main Feed Reg Valve Room and noticed water flowing in the manhole.
- The Condensate Storage Tank was declared inoperable
- Once the core boring was complete there appeared to be undermining of the area under the concrete slab.
- A lot of water was still coming into the hole during excavation
- During excavation and shoring, there were a lot of large rocks, cans, and other garbage in the fill that was used. The rocks were large enough to get stuck in the hose that was sucking out the mud from the hole
- Upon inspection of the pipe (the pipe was still leaking) there appeared to be a hole at the 7:00 position approximately 22" from the elbow weld joint.
- The coating was not present in the areas of the hole and/or indications. It appears to have been blown away over time. This could have been caused by initial damage to the coating during the backfill
- The area of the holes/indications probably saw constant groundwater and could have caused the erosion in the areas of the damaged coating. Note that the inside of the pipe was in pristine condition; no internal corrosion noted.

Observation 2

- Observed the area being excavated with sump pump installed, but no shoring yet. The hole was still ~ ½ full of water.
- Inspected pipe after clamp was installed. No areas coating had been stripped for UTs yet however, the coating appeared to be in bad shape and chewed up. Not sure if this was a result of the excavation, from original construction, or degradation over time.
- Additional observations of the coating indicated that it was not in uniform contact with the pipe and not tightly adhered to. Some scaling had occurred at some point as well.
- Did not witness the excavation activities however, did notice a lot of debris, especially stones in the area under the pipe. These were fist size or greater and seemed to be crushed rock not normally seen in areas of backfill.
- An indication was noted to have the appearance of a rock (or other object) that had been forced into the pipe and caused damage to the coating.
- Some of the pitting was very shiny which is unusual. It also appeared to be uniform in depth.

IPEC00203226

Observation 3

- Did not observe excavation efforts, but did see ~ 6" – 7" in the area around the pipe once it was exposed.
- The coating was already stripped and prepped for UTs.
- Based on a review of the photos it appears that the coating may not have been applied consistently during original construction. The workmanship was not up to current standards. The coating has a "rippled" look to it.
- Pipe thickness looked good

Observation 4

- Once the core boring was complete, observed a lot of debris in the hole during excavation.
- Items included large rocks, metal pieces, and Styrofoam packaging material.
- The rocks were large enough to clog the hose that was used to suck out the mud during excavation
- The hose was getting clogged frequently due to the large rocks and debris to the point where the hose needed to be disconnected at the truck end in order to clear it out.
- The sump pumps also appeared to be clogging frequently.
- The pressure from the rocks could have been enough to damage the coating and the surface of the pipe.

IPEC00203227

There is no safety significant to the operating plant as a direct result of the degraded condition on the 8" CST return line based on the following:

1. Overall integrity of the subject line was evaluated under calculation IP-CALC-09-00032 (EC 13322) to be structurally adequate per ASME CC-N513-2 with the through wall leak and the subject line remained operable.

2. Presence of the through wall leak can drain the 8" Condensate return but will not siphon the CST. Since the 8" CST Overflow Line enter/exit the CST at the same elevation, 115' 5" pipe centerline (Drawing 9321-2264) which is equipped with a ¾" siphon breaker hole drilled at the top of the pipe inside the tank (9-9237-DWG-19), the volume loss in the CST is effectively limited by what the bottom of the CST overflow pipe allows (34.01 ft from tank bottom) which is approximately 645,000 gallons (Graph TC-6, Rev 1 and Calculation FIX-00024).

3. The loss in inventory returned back to the CST, with the AFW pumps in operation re-circulating to the CST through a postulated degradation is estimated to be less than 15 GPM. This estimate is conservative since the increase in pressure at the area from pump operation is expected to be less than 1 psig. (Normal head pressure from the CST is about 40 psig. Estimated differential pressure drop through 300 feet of 8" schedule 40 pipe at a flow rate of 650 GPM is less than 1 psid from Appendix B Table B-14 of Crane Technical Paper 410). The increase of 1 psid over the initial 40 psid is about 1% in flow. Based on the pump out rate of approximately 10 – 12 GPM noted during uncovering of the subject pipe, the estimated increase is expected to be significantly less than 15 GPM stated. Assume a 15 GPM loss of inventory through the breach, the estimated volume loss from the CST for a 24 hours period would be about 21,600 gallons (1.13 feet in tank level).

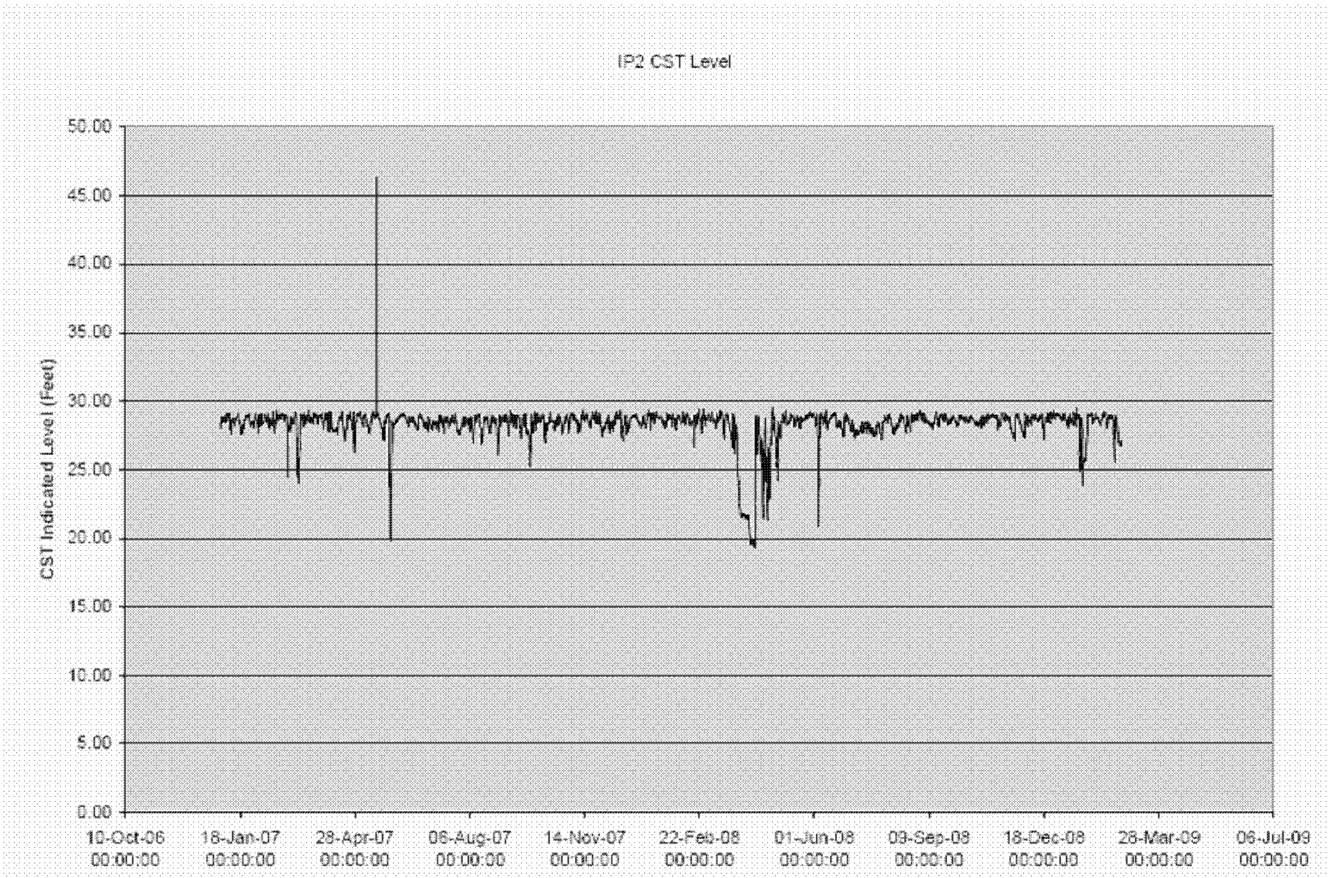
4. In support of decay heat removal, Technical Specification (TS) 3.7.6 require a minimum CST volume of 360,000 gallons for 24 hrs following a trip at 100.6% Rate Thermal Power (RTP). Due to the piping degradation, some of recirculation flow from operating AFW pump would be lost and additional volume in the CST is required for this 24 hours. Based on condition existed, CST volume would have to be increased by approximately 21,600 gallons to accommodate inventory loss through the breach above the 360,000 gallons resulting in a required volume of 381, 600 gallons. Rounding this to 400,000 gallons, it is equivalent to an approximately indicating level of 17 feet. A review of IP2 CST Trend since 1/1/2007 to present, minimum indicated CST level is above 19 feet. See attached CST trends. Additionally, multiple barriers are in place to support CST inventory above the 17 feet indicating level. These barriers includes a Low level alarms at 19.5 feet and 19.2 feet. Automatic closure of LCV-1158 at 18.21 feet.

5. There is no significant environmental impact since the leakage is discharged via the site storm drainage system because the CST is already identified in the IPEC SPEDES permit. Leakage was directed to the nearby storm drainage (e.g. Manhole #5). Environmental engineering was informed of condition and has been monitoring these discharges.

IPEC00203228

6. There is no industrial impact as result of the degradation. The leakage was underground below the concrete flooring. Subsequent excavation and repair to the subject pipe was conducted in accordance with the accepted work practice.

In summary, there is no safety significance to the health and safety of the public from nuclear, safety, industrial or environmental associated with the subject event due to the condition of the degrade 8" CST return line. Multiple barriers are in place to insure minimum required CST inventory is not challenge as a direct result of the piping degradation and any discharge are monitored consistent with the SPEDES permit.



IPEC00203229

Entergy	CONDITION REPORT	CR-IP3-1997-01361

Originator: PENNINO, DENNIS
Originator Phone: 9147368317
Originator Site Group: IP3 Systems Eng Mgmt
Operability Required: N
Supervisor Name:
Reportability Required: N
Discovered Date: 06/12/1997 00:00
Initiated Date: 06/12/1997 00:00

Condition Description:

Visual inspections of underground Service Water System piping headers 24"-#408 on 5/26/97 via WR 94-02209-00 and 24"-#409 on 6/11/97 via WR 94-02209-01 were made by a robotic crawler. Inspections were made of the -N/A- piping from the Backup SW Valve Pit toward the VC/PAB/CB. The interior of each header is in relatively good condition, but the following indications in both headers were found: cracks in the concrete linings, corrosion at most welds in varying degrees, random growths at welds and mid-piping. No concrete sections were seen to be missing or eroded, valves appear in acceptable condition, and no flow blockages or macrofouling were evident. Areas were identified where the cement lining was pitted, spalled, or otherwise appeared damaged or worn. None of the indications found are judged to make the piping "inoperable" at this time. Apparent Cause Codes: P21

Immediate Action Description:

NOTIFIED SW SYSTEMS ENGINEER.

Suggested Action Description:

Probable Cause: SPECIF/MANUF/INSTALL - INSTALLATION/CONSTRUCTION

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
SERVICE WATER PIPING	N/A	N/A	N/A
N/A	N/A	N/A	0151

REFERENCE ITEMS:

Type Code	Item Desc
#LEVEL OF DEFENSE	Inspection - Other- Self Assessment
ACT	ACT-97-27060
ACT	ACT-97-27690
ACT	ACT-97-27691
DATE SCRN	06/13/1997
DER	DER-97-01361

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
HU ERROR	HPE_NO
FUNCT AREA	FA-IN-SERVICE INSPECTION & TESTING PROGRAMS
PRIMARY CAUSE	PC-P2L OTHER
KEYWORDS	KW-EROSION/CORROSION

IPEC00203230

Entergy	CORRECTIVE ACTION	CR-IP3-1997-01361

CA Number: 1

	Site	Group	Name
Assigned By:	IP3	NSA CA&A Mgmt	
Assigned To:	IP3	Systems Eng Mgmt	PENNINO, DENNIS
Subassigned To :			

Originated By: JOWITT, ROSEANN 6/13/1997 00:00:00

Performed By:

Subperformed By:

Approved By:

Closed By: On File 7/15/1997 00:00:00

Current Due Date: 07/30/1997 **Initial Due Date:** 06/13/1997

CA Type: NOT AVAILABLE

Plant Constraint: #NONE

CA Description:

ACT-97-27060 : DER RESPONSE REPORT REQ'D IN ACCORDANCE WITH AP-8.2: VISUAL INSPECTIONS OF UNDERGROUND SERVICE WATER SYSTEM PIPING HEADERS 24"-#408 ON 5/26/97 VIA WR 94-02209-00 AND 24"-#409 ON 6/11/97 VIA WR 94-02209-01 WERE MADE BY A ROBOTIC CRAWLER. INSPECTIONS WERE MADE OF THE

CA REFERENCE ITEMS:

Type Code	Description
ACT	ACT-97-27060
DER	DER-97-01361

Response:

Not Available

Subresponse :

Closure Comments:

EVALUATION COMPLETE, SEE ACTS 27690, 27691

IPEC00203231

IPEC00203231

Entergy	CORRECTIVE ACTION	CR-IP3-1997-01361

CA Number: 2

	Site	Group	Name
Assigned By:	IP3	NSA CA&A Mgmt	
Assigned To:	IP3	Eng P&C Prog & Comp Mgmt	KAYANI, JOSEPH
Subassigned To :			

Originated By: JOWITT, ROSEANN 7/11/1997 00:00:00

Performed By:

Subperformed By:

Approved By:

Closed By: JOWITT, ROSEANN 5/15/2001 00:00:00

Current Due Date: 05/30/2001 **Initial Due Date:** 07/11/1997

CA Type: PREVENTIVE

Plant Constraint: #NONE

CA Description:

ACT-97-27690 : SCHEDULE/PERFORM FOR R11 OUTAGE ROBOTIC CRAWLER INSPECTIONS OF SWS LINE 408. THE R11 INSPECTIONS WILL BE COMPARED AGAINST THE PREVIOUS INSPECTIONS IN ATTEMPT TO DETECT ANY ADDITIONAL DEGRADATION OF THE CONCRETE LINING AND/OR WELD JOINT AREAS. TRACK PID 60347.

CA REFERENCE ITEMS:

Type Code	Description
ACT	ACT-97-27690
DER	DER-97-01361

Response:

A robotic crawler inspection of line 24"-#409 was performed on September 23, 1999 during the R10 outage under WR 98-03791-00. Results were satisfactory and were documented on videotape as well as on a written report from the vendor. No DERs were initiated.

Line 24"-#408 will be inspected during the R11 outage under PID 60347.

Note: WEKO seals will be installed in R11 (Line #408) and in R12 (Line #409).

Extend this ACT item to 05/30/01 to track the R11 inspection of Line #408. Note: Line 10"-#1099 to also be inspected during R11 under WR 98-03783-00 (ACT-98-32094). D.P. Pennino 9-26-99

Transferred to J. Kayani 11/2/99. D.P. Pennino

Line 24"-SWN #408 was inspected by the Hydra-Tight Seal installation vendor during RO11. Indications are that the liner is in satisfactory condition. The seals were installed internally at weld locations, as planned.
Line 10"-SWN #1099 was inspected by an outside vendor (VIT) on 5/2/01 (WR 00-02696-00). The cement linear appeared to be in good condition with no visible signs of cement missing anywhere. Now this ACT can be closed. JTK 5-14-01

Subresponse :

Closure Comments:

CLOSURE SUBMITTED

IPEC00203232

Entergy	CORRECTIVE ACTION	CR-IP3-1997-01361

CA Number: 3

	Site	Group	Name
Assigned By:	IP3	NSA CA&A Mgmt	
Assigned To:	IP3	Systems Eng Mgmt	PENNINO, DENNIS
Subassigned To :			

Originated By:	JOWITT, ROSEANN	7/11/1997 00:00:00
Performed By:		
Subperformed By:		
Approved By:		
Closed By:	On File	1/30/1998 00:00:00

Current Due Date: 12/31/1998 **Initial Due Date:** 07/11/1997

CA Type: CORRECTIVE ACTION

Plant Constraint: #NONE

CA Description:

ACT-97-27691 : EVALUATE THE INSTALLATION OF AMEX-101/WEKO SEAL(S) AND/OR OTHER INDUSTRY REPAIRS IN SWS PIPING HEADERS 408 AND 409 PRIOR TO R10 OUTAGE IF PIPING REPAIRS BECOME WARRANTED DURING R10 TRACK PID 60349

CA REFERENCE ITEMS:

Type Code	Description
ACT	ACT-97-27691
DER	DER-97-01361

Response:

WR 97-03341-01 scheduled for R10. Evaluation has been completed -- see notes page of WR 97-03341-00 and attached documentation. D.P. Pennino 1/19/98.

Subresponse :

Closure Comments:

EVALUATION COMPLETED; SEE NOTES PAGE OF WR 97-03341-00 AND DOCUMENTATION

IPEC00203233

Entergy	ADMIN	CR-IP3-1997-01361

Initiated Date: 6/12/1997 0:00 **Owner Site and Group:** IP3 Systems Eng Mgmt

Current Contact: JOWITT, ROSEANN

Current Significance: C - NO CARB

Closed by: On File 5/15/2001 0:00

Summary Description:

DER-97-01361: UNDERGROUND SERVICE WATER SYSTEM PIPING INDICATIONS: Visual inspections of underground Service Water System piping headers 24"-#408 on 5/26/97 via WR 94-02209-00 and 24"-#409 on 6/11/97 via WR 94-02209-01 were made by a robotic crawler. Inspections were made of the -N/A- piping from the Backup SW Valve Pit toward the VC/PAB/CB. The interior of each header is in relatively good condition, but the following indications in both headers were found: cracks in the concrete li

Remarks Description:

Not Available

Closure Description:

ALL ACTS ARE COMPLETED

IPEC00203234

OperabilityVersion: 1

Operability Code: ADMIN - NA

Immediate Report Code: NOT AVAILABLE

Performed By: Not Available 06/12/1997 00:00

Approved By: Not Available 06/12/1997 00:00

Operability Description:

Not Available

Approval Comments:

IPEC00203235

Version: 1

Significance Code: C - NO CARB

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP3 Systems Eng Mgmt

Performed By: JOWITT, ROSEANN 06/13/1997 00:00

Assignment Description:

Not Available

IPEC00203236

Entergy	REPORTABILITY	CR-IP3-1997-01361

Reportability Version: 1

Report Number:

Report Code: NOT AVAILABLE

Boilerplate Code: NOT AVAILABLE

Performed By : Not Available 06/12/1997 00:00

Reportability Description:

Not Available

IPEC00203237

IPEC00203237

Entergy	CONDITION REPORT	CR-IP3-2001-01780

Originator:	DE FRANCESCO, JOSEPH	**Originator Phone:**	9147362398
Originator Site Group:	IP3 Eng Project Mgmt Staff	**Operability Required:**	N
Supervisor Name:		**Reportability Required:**	N
Discovered Date:	05/04/2001 00:00	**Initiated Date:**	05/04/2001 00:00

Condition Description:

During the inspection of the underground 24" Service Water Line 408 six (6) additional welds were discovered that were not identified on existing plant drawings 9321-F-21073, 9321-F-27003 and 9321-F-27033. SK-00-3-008-001, which was prepared based on these drawings for DCP 00-3-008, does not identify these 6 welds. An ECN is required to incorporate these welds into the drawings to document field conditions.

Immediate Action Description:

Notified Engineering that an ECN is required to DCP 00-3-008 to document the field conditions.

Suggested Action Description:

Probable Cause: Unknown/Undetermined Cause

REFERENCE ITEMS:

Type Code	Item Desc
#EVENT DATE	05/04/2001
#LEVEL OF DEFENSE	Modification
ACT	ACT-01-55992
DATE SCRN	05/04/2001
DER	DER-01-01780

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
KEYWORDS	KW-MODIFICATION
KEYWORDS	KW-PLANT/DRAWING MISMATCH
KEYWORDS	KW-SELF-REVEALING
KEYWORDS	KW-WELDING
HU ERROR	HPE_NO
FUNCT AREA	FA-DESIGN OUTPUT DOCUMENTS
PRIMARY CAUSE	PC-M2F DESIGN CHANGE PREPARED USING INACCURATE/IN
KEYWORDS	KW-MANAGEMENT EMPLOYEE INITIATED

IPEC00203238

IPEC00203238

Entergy	CORRECTIVE ACTION	CR-IP3-2001-01780

CA Number: 1

	Site	Group	Name
Assigned By:	IP3	NSA CA&A Mgmt	
Assigned To:	IP3	Design Eng Mgmt	BANDA, LIONEL
Subassigned To :			

Originated By: SORRELL, WILLIAM 5/5/2001 00:00:00

Performed By:

Subperformed By:

Approved By:

Closed By: JOWITT, ROSEANN 5/31/2001 00:00:00

Current Due Date: 05/26/2001 **Initial Due Date:** 05/05/2001

CA Type: CORRECTIVE ACTION

Plant Constraint: #NONE

CA Description:

ACT-01-55992 : DESIGN ENGINEERING SUPPORT TO DEVELOP an ECN to DCP 00-3-008 to document the field conditions OF SIX WELDS NOT IDENTIFIED ON DRAWINGS

CA REFERENCE ITEMS:

Type Code	Description
ACT	ACT-01-55992
DER	DER-01-01780

Response:

Not Available

Subresponse :

Closure Comments:

ECN 00-3-008-009 WAS ISSUED 5/12/01

IPEC00203239

IPEC00203239

Entergy	ADMIN	CR-IP3-2001-01780

Initiated Date: 5/4/2001 0:00 **Owner Site and Group:** IP3 Unknown

Current Contact: SORRELL, WILLIAM

Current Significance: C - NO CARB

Closed by: On File 6/26/2001 0:00

Summary Description:

DER-01-01780: WELDS NOT IDENTIFIED ON EXISTING PLANT DRAWINGS: During the inspection of the underground 24" Service Water Line 408 six (6) additional welds were discovered that were not identified on existing plant drawings 9321-F-21073, 9321-F-27003 and 9321-F-27033. SK-00-3-008-001, which was prepared based on these drawings for DCP 00-3-008, does not identify these 6 welds. An ECN is required to incorporate these welds into the drawings to document field conditions.

Remarks Description:

Not Available

Closure Description:

ACTS 55992 IS COMPLETED

IPEC00203240

IPEC00203240

Entergy	ASSIGNMENTS	CR-IP3-2001-01780

Version: 1

Significance Code: C - NO CARB

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP3 Unknown

Performed By: SORRELL, WILLIAM 05/04/2001 00:00

Assignment Description:

ACTS TO DESIGN ENGINEERING SUPPORT TO DEVELOP an ECN to DCP 00-3-008 to document the field conditions. HISTORICAL HPE
EVENT CODE B2A

IPEC00203241

IPEC00203241

Entergy	CONDITION REPORT	CR-IP3-2002-04267

Originator:	Goerres,Andrew P	**Originator Phone:**	8221
Originator Site Group:	IP3 Operations Shift Manager Staff	**Operability Required:**	N
Supervisor Name:	Seaboldt,Jack J	**Reportability Required:**	N
Discovered Date:	10/18/2002 20:29	**Initiated Date:**	10/18/2002 20:40

Condition Description:

Steam leakage is suspected in the AUXILIARY STEAM cross-tie to UNIT 2 (downstream SB-62) underground in the fenced area between UNIT 2 & 3 immediately west of the Ecolochem trailers. Leakage is evidenced by steam rising up from underground and the ground in this area is caving in. Aux. Steam is currently cross-tied to support Unit 2. The Aux Steam Reducer (MS-PCV-19) was noted at between 3/8 and 1/2 open after leakage was suspected. On the previous night, this valve was approx. 1/4 open with similar outside air temperature on both nights.

Immediate Action Description:

Suggested Action Description:

Excavate and investigate. Radiological Controls should be considered prior to excavation due to the area being posted as containing radioactive materials.

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
SB-62	VALVE	5	0006
			0006

REFERENCE ITEMS:

Type Code	Item Desc
#LEVEL OF DEFENSE	Union operator initiated
CREW "B"	
WR	IP3-02-01227

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
KEYWORDS	KW-SELF-REVEALING
KEYWORDS	KW-UNION EMPLOYEE INITIATED
KEYWORDS	KW-LEAKS

IPEC00203242

IPEC00203242

Entergy	ADMIN	CR-IP3-2002-04267

Initiated Date: 10/18/2002 20:40 **Owner Site and Group:** IP3 Systems Eng Mgmt

Current Contact:

Current Significance: C - NO CARB

Closed by: Jowitt,Roseann 10/25/2002 11:41

Summary Description:

Remarks Description:

Closure Description:
CLOSED TO WORK CONTROL PROCESS

IPEC00203243

IPEC00203243

Entergy	**A S S I G N M E N T S**	**CR-IP3-2002-04267**

Version: 1

Significance Code: C - NO CARB

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP3 Systems Eng Mgmt

Performed By: Sorrell,William 10/21/2002 10:18

Assignment Description:

Close to work control process
CRG discussion - This is within the fensed in area, posting not required

IPEC00203244

IPEC00203244

Entergy	CONDITION REPORT	CR-IP3-2003-01615

Originator: DeClemente,Vincent
Originator Phone: 8498
Originator Site Group: IP3 Operations Shift Manager Staff
Operability Required: Y
Supervisor Name: Gillman,Marie
Reportability Required: Y
Discovered Date: 03/29/2003 17:26
Initiated Date: 03/29/2003 17:29

Condition Description:
During the performance of 3PT-CS32B, FLOW TEST OF SW HDR CK VLVS AND FLOW TEST OF UNDERGROUND PORTIONS OF LINE 408, the underground leakage portion of the test was unsatisfactory. Subsequently portions of the test were reperformed with less flow & higher pressure due to questionable data and results were closer to spec but still unsatisfactory.

Immediate Action Description:
IST Engineer notified.

Suggested Action Description:
Evaluate flow data due instrument inaccuracies.

REFERENCE ITEMS:

Type Code	Item Desc
KEYWORD	Service Water
KEYWORD	underground piping
KEYWORD	In Service Testing
SURVEILLANCE	

IPEC00203245

IPEC00203245

Entergy	CORRECTIVE ACTION	CR-IP3-2003-01615

CA Number: 1

	Site	Group	Name
Assigned By:	IP3	CRG/CARB/OSRC	Anderson,Harry R
Assigned To:	IP3	Eng P&C Prog & Comp Mgmt	Orlando,Thomas
Subassigned To :	IP3	Eng P&C Code Program Staff	Dolansky,Robert J

Originated By:	Anderson,Harry R	3/30/2003 12:49:21
Performed By:	Manzione,Stephen J	4/1/2003 13:22:58
Subperformed By:		
Approved By:		
Closed By:	Harrison,Christine B	4/2/2003 10:51:41

Current Due Date: 04/01/2003 **Initial Due Date:** 04/01/2003

CA Type: DISP - CORR ACTION

Plant Constraint: #NONE

CA Description:

** Note 48 hour due date ** Document concerns of Operability Determination in respect to 3R-12 is this required to be added to outage scope? Is it a GL 91-18 issue? Assign corrective actions as required.

Response:

See subresponse

Subresponse :

See attached

Closure Comments:

4/2/03: With concurrence of NSA Director, corrective action response closed and approved.

Attachments:

Subresp Description

IPEC00203246

IPEC00203246

Entergy	CORRECTIVE ACTION	CR-IP3-2003-01615

CA Number: 2

	Site	Group	Name
Assigned By:	IP3	NSA CA&A Staff	Jowitt,Roseann
Assigned To:	IP3	Eng P&C Prog & Comp Mgmt	Orlando,Thomas
Subassigned To :			

Originated By:	Jowitt,Roseann	4/3/2003 09:07:28
Performed By:	Orlando,Thomas	4/9/2003 16:12:23
Subperformed By:		
Approved By:		
Closed By:	Jowitt,Roseann	4/10/2003 09:26:18

Current Due Date: 04/17/2003 **Initial Due Date:** 04/17/2003

CA Type: CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

CAT-C, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE READY TO CLOSE. REVIEW CR AND APPROVE / DISAPPROVE CLOSURE IN ACCORDANCE WITH ENN-LI-102, SECTION 5.8.

Response:

I have reviewed the CR and CA response and it is satisfactory. TMO

Subresponse :

Closure Comments:

PER CA&A REVIEW, NOTED CR OWNER RECOMMENDS CLOSURE OF CR

IPEC00203247

Entergy	ADMIN	CR-IP3-2003-01615

Initiated Date: 3/29/2003 17:29 **Owner Site and Group:** IP3 Eng P&C Prog & Comp Mgmt

Current Contact:

Current Significance: C - REVIEW & CORRECT

Closed by: Jowitt,Roseann 4/10/2003 9:26

Summary Description:

Remarks Description:

Closure Description:

Per CA&A review, concur with the CR owner's recommendation to close the CR. The issue was resolved or further tracking is via the referenced lower tier process identifier, therefore this CR close

IPEC00203248

Entergy	OPERABILITY	CR-IP3-2003-01615

OperabilityVersion:	1	
Operability Code:	OPERABLE - JUDGEMENT	
Immediate Report Code:	NOT REPORTABLE	
Performed By:	Small,Albert J	03/30/2003 04:28
Approved By:	Small,Albert J	03/30/2003 04:29

Operability Description:

operable- no CA required as I have already received the Operability determination 03-07

Approval Comments:

IPEC00203249

IPEC00203249

Version: 1

Significance Code: C - REVIEW & CORRECT

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP3 Eng P&C Prog & Comp Mgmt

Performed By: Anderson,Harry R 03/30/2003 12:46

Assignment Description:

** Assigned 48 hour due date to document Operability Determination concerns **

IPEC00203250

Entergy	REPORTABILITY	CR-IP3-2003-01615

Reportability Version: 1

Report Number:

Report Code: NOT REPORTABLE

Boilerplate Code: NOT REPORTABLE

Performed By : Prussman,Stephen G 03/30/2003 06:02

Reportability Description:

Not reportable - This event does not meet the screening criteria of PAP 01-S-06-5, Att III. An OD indicates SW is operable therefore not reportable.

IPEC00203251

IPEC00203251

Entergy	CONDITION REPORT	CR-IP3-2007-01862

Originator:	Gores Jr,Ronald R	**Originator Phone:**	8217
Originator Site Group:	IP3 Operations Watch Staff	**Operability Required:**	N
Supervisor Name:	Smyers Jr,Carl Dennis	**Reportability Required:**	N
Discovered Date:	04/09/2007 08:18	**Initiated Date:**	04/09/2007 08:26

Condition Description:

This CR is to heighten the awareness of the underground steam leaks northwest of the U3 turbine building. These leaks and associated deteriorated asphalt and roadway, in addition to the previously 'repaired' sinkholes surrounding the water factory, could pose a serious safety hazard for any trailers that are moved through the area. If the transformer replacement plan requires this route, the operation could be severly hindered by the road condition. These conditions were noted in CR IP3-2007-01852.

Immediate Action Description:

Informed CRS.

Suggested Action Description:

Take immediate action to determine the extent of degradation to the roadway.

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP3-2007-01852
KEYWORDS	roadway
KEYWORDS	transformer replacement
KEYWORDS	SAFETY

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
EV	MAMS
KEYWORDS	KW-DRAINAGE DITCHES
HEP FACTOR	E
INPO BINNING	ER1
KEYWORDS	KW-INDUSTRIAL SAFETY
REPORT WEIGHT	1

IPEC00203252

IPEC00203252

Initiated Date: 4/9/2007 8:26 **Owner Site and Group:** IP3 Design Eng Civil/Str Mgmt

Current Contact:

Current Significance: D - ADMIN CLOSURE

Closed by: Harrison,Christine B 4/11/2007 12:54

Summary Description:

This CR is to heighten the awareness of the underground steam leaks northwest of the U3 turbine building. These leaks and associated deteriorated asphalt and roadway, in addition to the previously 'repaired' sinkholes surrounding the water factory, could pose a serious safety hazard for any trailers that are moved through the area. If the transformer replacement plan requires this route, the operation could be severly hindered by the road condition. These conditions were noted in CR IP3-2007-01852.

Remarks Description:

Closure Description:

4/10/07: Per CRG, the review of this CR will be included in the Category C Review assigned to Design Engineering-Civil under CR-IP3-2007-01852.

IPEC00203253

Entergy	A S S I G N M E N T S	CR-IP3-2007-01862

Version: 1

Significance Code: D - ADMIN CLOSURE

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP3 Design Eng Civil/Str Mgmt

Performed By: Harrison,Christine B 04/10/2007 11:47

Assignment Description:

4/10/07: Per CRG, the review of this CR will be included in the Category C Review assigned to Design Engineering-Civil under CR-IP3-2007-01852.

IPEC00203254

IPEC00203254

Entergy	CONDITION REPORT	CR-IP3-2007-01862

Originator: Gores Jr,Ronald R
Originator Phone: 8217
Originator Site Group: IP3 Operations Watch Staff
Operability Required: N
Supervisor Name: Smyers Jr,Carl Dennis
Reportability Required: N
Discovered Date: 04/09/2007 08:18
Initiated Date: 04/09/2007 08:26

Condition Description:

This CR is to heighten the awareness of the underground steam leaks northwest of the U3 turbine building. These leaks and associated deteriorated asphalt and roadway, in addition to the previously 'repaired' sinkholes surrounding the water factory, could pose a serious safety hazard for any trailers that are moved through the area. If the transformer replacement plan requires this route, the operation could be severely hindered by the road condition. These conditions were noted in CR IP3-2007-01852.

Immediate Action Description:

Informed CRS.

Suggested Action Description:

Take immediate action to determine the extent of degradation to the roadway.

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP3-2007-01852
KEYWORDS	roadway
KEYWORDS	transformer replacement
KEYWORDS	SAFETY

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
EV	MAMS
KEYWORDS	KW-DRAINAGE DITCHES
HEP FACTOR	E
INPO BINNING	ER1
KEYWORDS	KW-INDUSTRIAL SAFETY
REPORT WEIGHT	1

IPEC00203255

Entergy	ADMIN	CR-IP3-2007-01862

Initiated Date: 4/9/2007 8:26 **Owner Site and Group:** IP3 Design Eng Civil/Str Mgmt

Current Contact:

Current Significance: D - ADMIN CLOSURE

Closed by: Harrison,Christine B 4/11/2007 12:54

Summary Description:

This CR is to heighten the awareness of the underground steam leaks northwest of the U3 turbine building. These leaks and associated deteriorated asphalt and roadway, in addition to the previously 'repaired' sinkholes surrounding the water factory, could pose a serious safety hazard for any trailers that are moved through the area. If the transformer replacement plan requires this route, the operation could be severly hindered by the road condition. These conditions were noted in CR IP3-2007-01852.

Remarks Description:

Closure Description:

4/10/07: Per CRG, the review of this CR will be included in the Category C Review assigned to Design Engineering-Civil under CR-IP3-2007-01852.

IPEC00203256

Entergy	ASSIGNMENTS	CR-IP3-2007-01862

Version: 1

Significance Code: D - ADMIN CLOSURE

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP3 Design Eng Civil/Str Mgmt

Performed By: Harrison,Christine B 04/10/2007 11:47

Assignment Description:

4/10/07: Per CRG, the review of this CR will be included in the Category C Review assigned to Design Engineering-Civil under CR-IP3-2007-01852.

IPEC00203257

Entergy	CONDITION REPORT	CR-IP3-2009-01547

Originator:	Pennino,Dennis P	**Originator Phone:**	9142717216
Originator Site Group:	IP3 P&C Eng Codes Staff IP3	**Operability Required:**	N
Supervisor Name:	Azevedo,Nelson F	**Reportability Required:**	N
Discovered Date:	04/01/2009 16:06	**Initiated Date:**	04/01/2009 16:27

Condition Description:

A remote robotic crawler inspection was performed of U3 underground Service Water Line 10"-#1099 under WO 00133288-01 in 3R15. The inspection identified a piping connection of indeterminate size in this line that is not shown on plant design drawings (9321-F-27223, 9321-F-22363, and 9321-F-22573 Sh. 1). The connection is located in 10"-Line # 1099 approximately 82' due north from the 8" flange in the transformer yard valve pit. The connection appears to be blind flanged or capped. The original purpose of this connection is unknown.

Immediate Action Description:

Suggested Action Description:

Revise 9321-F-27223, 9321-F-22363, and 9321-F-22573 Sh. 1 as necessary.

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
LINE 10"-#1099		PIPE	SW

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP3-2009-01538
DWG	9321-F-27223
DWG	9321-F-22363
DWG	9321-F-22573 Sh. 1
WON	00133288-01

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
INPO BINNING	CM3
HEP FACTOR	P
CL	ESDE
KEYWORDS	KW-DRAWING ERROR
KEYWORDS	KW-CONFIGURATION OTHER
KEYWORDS	KW-SERVICE WATER
KEYWORDS	KW-PIPE LINING
REPORT WEIGHT	1

IPEC00203258

Entergy	ADMIN	CR-IP3-2009-01547

Initiated Date: 4/1/2009 16:27 **Owner Site and Group:** IP3 P&C Eng Codes Mgmt IP3

Current Contact:

Current Significance: D

Closed by: Harrison,Christine B 4/2/2009 7:43

Summary Description:

A remote robotic crawler inspection was performed of U3 underground Service Water Line 10"-#1099 under WO 00133288-01 in 3R15. The inspection identified a piping connection of indeterminate size in this line that is not shown on plant design drawings (9321-F-27223, 9321-F-22363, and 9321-F-22573 Sh. 1). The connection is located in 10"-Line # 1099 approximately 82' due north from the 8" flange in the transformer yard valve pit. The connection appears to be blind flanged or capped. The original purpose of this connection is unknown.

Remarks Description:

Closure Description:

Per 4/1/09 night CRG, this CR approved for inclusion and closure to related CR IP3-2009-01538. Mode 4 Hold has been added on CR-IP3-2009-01538 per AM CRG 4/2/09.

IPEC00203259

Entergy	ASSIGNMENTS	CR-IP3-2009-01547

Version: 1

Significance Code: D

Classification Code: CLOSE TO CR

Owner Site and Group: IP3 P&C Eng Codes Mgmt IP3

Performed By: Reynolds,Joseph A 04/01/2009 22:05

Assignment Description:

Per 4/1/09 night CRG, this CR approved for inclusion and closure to related CR IP3-2009-01538. Mode 4 Hold has been added on CR-IP3-2009-01538 per AM CRG 4/2/09.

IPEC00203260

Entergy	CONDITION REPORT	CR-IP3-2009-01551

Originator:	Pennino,Dennis P	**Originator Phone:**	9142717216
Originator Site Group:	IP3 P&C Eng Codes Staff IP3	**Operability Required:**	N
Supervisor Name:	Azevedo,Nelson F	**Reportability Required:**	N
Discovered Date:	04/01/2009 18:40	**Initiated Date:**	04/01/2009 18:52

Condition Description:

A remote robotic crawler inspection was performed of U3 underground Service Water Line 10"-#1099 under WO 00133288-01 in 3R15. Access was made at the location of removed valve SWN-29 and the inspection was performed toward the EDGs. The inspection identified small debris and concrete pieces in various locations on the bottom of the piping. Origination of the concrete pieces was indeterminate. The debris appeared to be organic in nature, i.e., from the river, that was small enough to pass through the zurn strainers. No clearly identified missing sections of concrete lining were noted.

Immediate Action Description:

None.

Suggested Action Description:

None. Documentation / trending only. No impact on EDG cooling. Small pieces of cement lining have been previously found in the EDG coolers and documented in CRs. No previous component damage or adverse functionality impacts have been observed.

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
10"-LINE #1099		PIPE	SW

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP3-2009-01538
DOC	OPSW
WON	00133288

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
HEP FACTOR	E
REPORT WEIGHT	1
INPO BINNING	ER3
KEYWORDS	KW-FOREIGN MATERIAL CONTROL
KEYWORDS	KW-PIPE LINING
KEYWORDS	KW-SERVICE WATER
EM	ESPC

IPEC00203261

IPEC00203261

Entergy	ADMIN	CR-IP3-2009-01551

Initiated Date: 4/1/2009 18:52 **Owner Site and Group:** IP3 P&C Eng Codes Mgmt IP3

Current Contact:

Current Significance: D

Closed by: Harrison,Christine B 4/8/2009 7:40

Summary Description:

A remote robotic crawler inspection was performed of U3 underground Service Water Line 10"-#1099 under WO 00133288-01 in 3R15. Access was made at the location of removed valve SWN-29 and the inspection was performed toward the EDGs. The inspection identified small debris and concrete pieces in various locations on the bottom of the piping. Origination of the concrete pieces was indeterminate. The debris appeared to be organic in nature, i.e., from the river, that was small enough to pass through the zurn strainers. No clearly identified missing sections of concrete lining were noted.

Remarks Description:

4/8/09: Per AM CRG, operability review approved. This CR may be closed. (cbh)
4/2/09: DO NOT CLOSE this CR until operability review is performed and approved by CRG. (cbh)

Closure Description:

4/2/09: Per AM CRG, the review of this CR will be included in the Category C Review and Mode 4 Hold CA assigned to Code Programs under CR-IP3-2009-01538.

IPEC00203262

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Carroll,Michael J 04/02/2009 13:35

Approved By: Faughnan,Philip J 04/02/2009 15:19

Operability Description:

This condition is not reportable IAW IP-SMM-LI-108. All debris is small in size. Total flow blockage of the piping is not a concern.
Some debris pieces may eventually find their way into one or more EDG coolers. This is a known issue and has been addressed by prior CRs which documented such conditions during the as-found inspections. The nature and amount of the debris is such that debris in the coolers will not hinder cooling or cause damage to tubes, tube ends, or tubesheets. Valves SWN-55, FCV-1176, & FCV-1176A on the outlet sides of the coolers will not be adversely affected by any debris small enough to pass through the cooler tubes. None of the observed debris will adversely impact SW flow to, or cooling of the EDGs, from Line 1099. Service Water and the EDG's are Operable.

Approval Comments:

Approved

IPEC00203263

IPEC00203263

Version: 1

Significance Code: D

Classification Code: CLOSE TO CR

Owner Site and Group: IP3 P&C Eng Codes Mgmt IP3

Performed By: Harrison,Christine B 04/02/2009 07:45

Assignment Description:

4/2/09: Per AM CRG, the review of this CR will be included in the Category C Review and Mode 4 Hold CA assigned to Code Programs under CR-IP3-2009-01538.

IPEC00203264

Entergy	CONDITION REPORT	CR-IP3-2009-01552

Originator: Pennino,Dennis P
Originator Phone: 9142717216
Originator Site Group: IP3 P&C Eng Codes Staff IP3
Operability Required: N
Supervisor Name: Azevedo,Nelson F
Reportability Required: N
Discovered Date: 04/01/2009 19:01
Initiated Date: 04/01/2009 19:16

Condition Description:

A remote robotic crawler inspection was performed of U3 underground Service Water Line 10"-#1099 under WO 00133288-01 in 3R15. Access was made at the location of removed valve SWN-29 and the inspection was made upstream back toward the transformer yard. The inspection identified internal corrosion, possibly galvanic in nature, and some resulting minor ID flow restriction, at the flanged joint connecting 3"-Line # 1224 (6% moly stainless steel) and 10"-Line #1099 (cement-lined carbon steel). Line 3"-#1224 is the 32 CCRAC supply line. SW flow to the 32 CCRAC judged to be not materially impacted.

Immediate Action Description:

Suggested Action Description:

WR 00160497 initiated to break flanged joint, inspect, clean and repair as necessary.

EQUIPMENT:

Tag Name	Tag Suffix Name	Component Code	Process System Code
10"-LINE #1099		PIPE	SW
3"-LINE #1224		PIPE	SW

REFERENCE ITEMS:

Type Code	Item Desc
CR	IP3-2009-01538
WON	00133288-01
WRN	00160497

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
INPO BINNING	ER3
REPORT WEIGHT	1
EM	ESPC
KEYWORDS	KW-CODES & STANDARDS
HEP FACTOR	E
KEYWORDS	KW-PIPE DEFECT
KEYWORDS	KW-SERVICE WATER

IPEC00203265

IPEC00203265

Entergy	ADMIN	CR-IP3-2009-01552

Initiated Date: 4/1/2009 19:16 **Owner Site and Group:** IP3 P&C Eng Codes Mgmt IP3

Current Contact:

Current Significance: D

Closed by: Harrison,Christine B 4/2/2009 7:47

Summary Description:

A remote robotic crawler inspection was performed of U3 underground Service Water Line 10"-#1099 under WO 00133288-01 in 3R15. Access was made at the location of removed valve SWN-29 and the inspection was made upstream back toward the transformer yard. The inspection identified internal corrosion, possibly galvanic in nature, and some resulting minor ID flow restriction, at the flanged joint connecting 3"-Line # 1224 (6% moly stainless steel) and 10"-Line #1099 (cement-lined carbon steel). Line 3"-#1224 is the 32 CCRAC supply line. SW flow to the 32 CCRAC judged to be not materially impacted.

Remarks Description:

Closure Description:

4/2/09: Per AM CRG, the review of this CR will be included in the Category C Review and Mode 4 Hold CA assigned to Code Programs under CR-IP3-2009-01538.

IPEC00203266

IPEC00203266

OperabilityVersion: 1

Operability Code: EQUIPMENT INOPERABLE

Immediate Report Code: NOT REPORTABLE

Performed By: Long,Leonard R 04/02/2009 01:37

Approved By: Lewis,Matthew W 04/02/2009 02:15

Operability Description:

As per the problem description, the flow restriction is minor in nature and appears to not impact the SW flow to 32 CCRAC. Lines #1099 and #1224 are currently inoperable for 3R15 work (4, 5, 6 header is held off), this minor corrosion does not make the SW system inoperable. Additionally, while SW operability not required in the current mode, the SW system must be available to support systems that are required to be operable. CCRAC is not required to be operable below mode 4, but CCR Ventillation is required and is on the 1, 2, 3 header so remains operable. After discussions with engineering, there is no indication of cracking and/or pipe leaks at this time. The SW system will be returned to operable status iaw the work control process, no additional requirements are needed at this time. This is not reportable per LI-108.

Approval Comments:

Approve.

IPEC00203267

Version: 1

Significance Code: D

Classification Code: CLOSE TO CR

Owner Site and Group: IP3 P&C Eng Codes Mgmt IP3

Performed By: Harrison,Christine B 04/02/2009 07:47

Assignment Description:

4/2/09: Per AM CRG, the review of this CR will be included in the Category C Review and Mode 4 Hold CA assigned to Code Programs under CR-IP3-2009-01538.

IPEC00203268

Entergy	CONDITION REPORT	CR-IP3-2001-04447

Originator:	DOLANSKY, ROBERT	**Originator Phone:**	9147368458
Originator Site Group:	IP3 Eng P&C Prog & Comp Mgmt	**Operability Required:**	Y
Supervisor Name:		**Reportability Required:**	Y
Discovered Date:	12/07/2001 00:00	**Initiated Date:**	12/07/2001 00:00

Condition Description:

The pressure test for the underground portion of condensate line 1070 from the CST to the Auxiliary Boiler Feedwater Building floor appears weak. Investigation continuing on future testing to ensure all ASME Section XI requirements are adressed.

Immediate Action Description:

Informed the SM

Suggested Action Description:

Probable Cause: Written Procedure/Documents

REFERENCE ITEMS:

Type Code	Item Desc
#EVENT DATE	12/07/2001
#LEVEL OF DEFENSE	Inspection - NRC - Region
ACT	ACT-01-60165
ACT	ACT-01-60628
ACT	ACT-02-62872
DATE SCRN	12/10/2001
DER	DER-01-04447
OUTAGE	R12

TRENDING (For Reference Purposes Only):

Trend Type	Trend Code
KEYWORDS	KW-SELF-ID
KEYWORDS	KW-TESTING
HU ERROR	HPE_NO
FUNCT AREA	FA-PIPE
PRIMARY CAUSE	PC-B3D INFORMATIONAL PRESENTATION DEFICIENCIES
KEYWORDS	KW-MANAGEMENT EMPLOYEE INITIATED

IPEC00203269

IPEC00203269

Entergy	CORRECTIVE ACTION	CR-IP3-2001-04447

CA Number: 1

	Site	Group	Name
Assigned By:	IP3	NSA CA&A Mgmt	
Assigned To:	IP3	Eng P&C Prog & Comp Mgmt	DOLANSKY, ROBER
Subassigned To :			

Originated By: JOWITT, ROSEANN 12/10/2001 00:00:00

Performed By:

Subperformed By:

Approved By:

Closed By: JOWITT, ROSEANN 1/25/2002 00:00:00

Current Due Date: 12/31/2001 **Initial Due Date:** 12/10/2001

CA Type: DRR

Plant Constraint: #NONE

CA Description:

ACT-01-60165 : DRR Required in Accordance with AP-8.2
The pressure test for the underground portion of condensate line 1070 from the CST to the Auxiliary Boiler Feedwater Building floor appears weak. Investigation continuing on future testing to ensure all ASME Section XI requirements are adressed.

CA REFERENCE ITEMS:

Type Code	Description
ACT	ACT-01-60165
DER	DER-01-04447

Response:

Not Available

Subresponse :

Closure Comments:

EVALUATION COMPLETE, SEE ACTS 60628

IPEC00203270

IPEC00203270

Entergy	CORRECTIVE ACTION	CR-IP3-2001-04447

CA Number: 2

	Site	Group	Name
Assigned By:	IP3	Eng P&C Prog & Comp Mgmt	
Assigned To:	IP3	Eng P&C Code Program Staff	Dolansky,Robert J
Subassigned To :			

Originated By:	DOLANSKY, ROBERT	12/26/2001 00:00:00
Performed By:	Dolansky,Robert J	12/16/2002 13:35:28
Subperformed By:		
Approved By:		
Closed By:	Manzione,Stephen J	12/17/2002 08:54:38

Current Due Date: 12/26/2002 **Initial Due Date:** 12/26/2001

CA Type: CORRECTIVE ACTION

Plant Constraint: B4

CA Description:

ACT-01-60628 : Incorporate the requirements of ASME Section XI IWA-5244(a) for all buried piping in pressure tests which will be performed during R-12.

As part of this ACT ensure all buried ISI piping is addressed.

CA REFERENCE ITEMS:

Type Code	Description
ACT	ACT-01-60628
DER	DER-01-04447
OUTAGE	R12

Response:

The requirements of ASME Section XI IWA-5244(a) for all buried ISI piping have been incorporated in pressure tests which will be performed in R-12.

Surveillance test 3PT-V32T was drafted and given to the operations procedure group to write. The draft of 3PT-V32T performs a pressure loss test on the underground portion of Line 1070 from the CST to the AFW pumps suction.

Surveillance tests 3PT-CS32A and 3PT-CS32B were marked up and given to the operations procedure group to write. The markup added the requirement to perform flow testing of the underground portions of the service water piping.

The draft procedure and mark ups given to operations will address all buried ISI piping.

Subresponse :

Closure Comments:

Response accepted

IPEC00203271

IPEC00203271

Entergy	CORRECTIVE ACTION	CR-IP3-2001-04447

CA Number: 3

	Site	Group	Name
Assigned By:	IP3	Eng P&C Prog & Comp Mgmt	
Assigned To:	IP3	Eng P&C Prog & Comp Mgmt	Orlando,Thomas
Subassigned To :	IP3	Eng P&C Civil/Elec Staff	Manzione,Stephen J

Originated By:	TOTH, SOFIA	5/1/2002 00:00:00
Performed By:	Manzione,Stephen J	5/21/2002 12:39:37
Subperformed By:	Manzione,Stephen J	5/21/2002 12:35:54
Approved By:		
Closed By:	Manzione,Stephen J	5/21/2002 12:39:37

Current Due Date: 05/30/2002 **Initial Due Date:** 05/01/2002

CA Type: CORRECTIVE ACTION

Plant Constraint: #NONE

CA Description:

ACT-02-62872 : In preparing for a recent Nuclear Regulatory Commission (NRC) public meeting, Licensing noted that several Indian Point Energy Center responses to NRC non-cited violations (NCVs) were fragmented, or documented poorly. To ensure the quality of IPEC responses to the NRC, Licensing has assigned ACTS items to involved departments to review their responses and to present a status to the On Site Review Committee (OSRC). Please e-mail your presentation on NVC 2001-011-02 to OSRC Secretary Vicki Williams by May 30. If you have any questions, please contact John Donnelly at extension 8310.

CA REFERENCE ITEMS:

Type Code	Description
ACT	ACT-02-62872
DER	DER-01-04447

Response:

Sub Response below is acceptable.

Subresponse :

The attached response were successfully presented to OSRC 5/21/02

Closure Comments:

Attachments:

Subresp Description

IPEC00203272

IPEC00203272

Entergy	CORRECTIVE ACTION	CR-IP3-2001-04447

CA Number: 4

	Site	Group	Name
Assigned By:	IP3	NSA CA&A Staff	Schmidt,George P
Assigned To:	IP3	Eng P&C Prog & Comp Mgmt	Orlando,Thomas
Subassigned To :			

Originated By:	Schmidt,George P	12/19/2002 07:54:54
Performed By:	Manzione,Stephen J	12/19/2002 09:11:02
Subperformed By:		
Approved By:		
Closed By:	Jowitt,Roseann	12/20/2002 11:26:23

Current Due Date: 01/03/2003 **Initial Due Date:** 01/03/2003

CA Type: CA-CR CLOSURE REVIEW

Plant Constraint: #NONE

CA Description:

CAT-C, ALL CORRECTIVE ACTIONS ARE CLOSED FOR THIS CR, THEREFORE THIS CR MAY BE READY TO CLOSE. REVIEW CR AND APPROVE / DISAPPROVE CLOSURE IN ACCORDANCE WITH ENN-LI-102, SECTION 5.8 .

Response:

Response is accepted

Subresponse :

Closure Comments:

OKAY TO CLOSE

IPEC00203273

Entergy	ADMIN	CR-IP3-2001-04447

Initiated Date: 12/7/2001 0:00 **Owner Site and Group:** IP3 Eng P&C Prog & Comp Mgmt

Current Contact: SORRELL, WILLIAM

Current Significance: C - NO CARB

Closed by: Jowitt,Roseann 12/20/2002 11:27

Summary Description:

DER-01-04447: Weakness in pressure testing of condensate line 1070: The pressure test for the underground portion of condensate line 1070 from the CST to the Auxiliary Boiler Feedwater Building floor appears weak. Investigation continuing on future testing to ensure all ASME Section XI requirements are adressed.

Remarks Description:

Not Available

Closure Description:

ALL ACTS ARE COMPLETED

IPEC00203274

OperabilityVersion: 1

Operability Code: EQUIPMENT OPERABLE

Immediate Report Code: NOT AVAILABLE

Performed By: SMALL, ALBERT 12/07/2001 00:00

Approved By: SMALL, ALBERT 12/07/2001 00:00

Operability Description:

Operable, This is not an operability issue, but a code piping conformance issue that needs to have a further evaluation done via DER response.

Approval Comments:

IPEC00203275

Entergy	A S S I G N M E N T S	CR-IP3-2001-04447

Version: 1

Significance Code: C - NO CARB

Classification Code: NON-SIGNIFICANT

Owner Site and Group: IP3 Eng P&C Prog & Comp Mgmt

Performed By: SORRELL, WILLIAM 12/10/2001 00:00

Assignment Description:

SM COMMENTS: Operable, This is not an operability issue, but a code piping conformance issue that needs to have a further evaluation done via DER response. EVENT CODE A2B1
CHANGED TO NRC IDENTIFIED 12/13/01 WHS
PLT DISCUSSION - DER-01-04575 CLOSED TO THIS DER EVALUATION

IPEC00203276

Entergy	REPORTABILITY	CR-IP3-2001-04447

Reportability Version: 1

Report Number:

Report Code: NOT AVAILABLE

Boilerplate Code: NOT AVAILABLE

Performed By : SMALL, ALBERT 12/07/2001 00:00

Reportability Description:

Not Available

IPEC00203277

IPEC00203277

Response to non-cited violation concerning hydrostatic testing of SCBA air cylinders

Background:

DERs 01-04041 and 02-00024 were issued to document that several SCBA air cylinders were outside their hydrostatic test frequency. Hydrostatic testing for SCBA (Self-Contained Breathing Apparatus) air cylinders is a three-year requirement for composite (aluminum wrapped with fiberglass) construction.

Problem Statement:

During the Radiation Protection Inspection (Report 50-286/01-09), the NRC inspector requested information regarding hydrostatic testing for SCBA (Self-Contained Breathing Apparatus) air cylinders. A full inspection of all 259-air cylinders was conducted by Fire Protection. Seventy three cylinders (28%) were found to be past due for hydro testing.

Cause:

All 73 cylinders found delinquent were new cylinders not previously required for hydro testing. It was determined that new air cylinders received in 1999 were manufactured as bar back as June 1998. The equipment was received and placed into service in late 1999 and early 2000.

Conversation with the vendor, Olympic Glove and Safety, and the manufacturer, MSA, indicate it is commonplace to ship on-shelf warehouse stock 12-18 months from the date of the manufacture of the cylinder. Thus, new equipment received may only have half of its required service life before the next due hydro test. Such was the case with our cylinders. They required hydro test in June 2001, less than two years after they were received as new.

Extent of Condition:

The extent of condition is limited to the SCBAs used by fire protection and have been addressed by this investigation.

IPEC00203278

Safety Impact:

There was no safety impact associated with this event. The SCBAs in question were immediately removed from service.

Corrective Actions:

All 73 identified cylinders were immediately removed from service and sent for hydro testing. All cylinders were tested, passed the criteria and returned to service within approximately ten working days of the discovery.

To prevent further missed hydro tests, FP-13, "Inspection and Testing of Self-Contained Breathing Apparatus" was revised to include a step under Sections 4.4.1.1 and 4.5.1.1, "Pressure and Visual Inspection" (c) to verify the cylinder is not within two months of the next required hydro test. Additionally, Section 4.8.1.4 was added to verify the same requirement on all spare air cylinders.

To prevent future purchase of already "old" air cylinders, Fire Protection will require as part of the purchase order that "all cylinders received be within two months of their manufacture date or they will be returned to the vendor."

Additionally, all air cylinders are now bar coded and have been added to our computerized tracking program. This program is able to supply instant information on any air cylinder including manufacture date, date of last hydro test and date of next required hydro test.

IPEC00203279

Response to non-cited violation concerning pressure testing of underground piping.

Background:

DERs 01-4447 & 01-4575 were issued last year to document the fact that the underground portion of condensate line 1070 did not address the requirements of ASME section XI paragraph IWA-5244(a). The requirements include testing the line every 31/3 years during the 10 year IST interval. For underground piping, leakage testing is performed which determines the rate of pressure loss or the change in flow between the ends of the buried components. This line runs from the CST to the ABFP building floor. These requirements were in effect for the 2nd ten year IST interval which ran from 8/30/86 to 7/21/00 and were not required in the first IST interval for the plant. Currently, the plant is in its third 10 year ISI interval and the testing of this line is not due until RO-12.

Problem Statement:

Contrary to the requirements of ASME section XI paragraph IWA-5244(a), line 1070 should have been tested three times using a leakage or flow test during this interval but was not.

Cause:

The cause to properly address the requirements of ASME section XI paragraph IWA-5244(a) is change management. There was no clear program owner of the pressure testing program in the late 1980's and early 1990's. Although the testing was performed by site personnel, code relief requests were written by the corporate office.

Extent of Condition:

The extent of condition applies to all ASME section XI buried piping.

Corrective Action:

ACTs item 01-60628 was issued to incorporate testing as required by IWA-5244(a) for all buried piping to meet the RO-12 schedule. In addition, the pressure testing program is now owned by the site's program and component engineering group.

Safety Impact:

There is no safety impact. The design of the underground piping is such that a significant leak would be detected by leakage on the floor of the ABFP building. The piping is in a trench of solid rock cut during construction. Should a leak occur, the water would be

IPEC00203280

contained by the rock and eventually find its way up the floor sleeve in the building. In addition, every two years the AFW pumps are run at full flow. A significant leak would result in the pumps being unable to deliver full flow to the steam generators. Finally, during the AFW pump full flow test, the CST height is recorded and pump suction pressure is measured. The difference between the calculated head and the indication on the suction pressure gauge was off by an insignificant amount, .1 psig. Again, a significant leak would have yielded a greater difference between these measurements.

IPEC00203281