| ENTERGY | ENGINEERING STANDARD | EN-EP-S-002-MULTI | REV. 0 |
|---|---|---|---|
| | Buried Piping and Tanks General Visual Inspection | PAGE 12 OF 12 | |

**ATTACHMENT 7.1** **INSPECTION CHECKLIST**

Sheet 1 of 2

**Piping / Tank** IP2 Service Water 24-inch Line 409 (WO # 279576-02) **INSPECTION DATE:** 11/23/11

**ELEVATION:** pipe centerline @ EL. 8'-6"; grade @ El. 15' (approx.) **LOCATION DWG:** 9321-2700 (Zone B-3) **INSPECTOR:** M. Terpening

| | | | | NOTE |
|---|---|---|---|---|
| 1. | ANY BLISTERING (COATING)? | YES ☐ | NO ☒ | |
| 2. | ANY PEELING (COATING)? | YES ☒ | NO ☐ | top layer of tape wrap at access point, but no defect beyond top layer |
| 3. | ANY FLAKING (COATING)? | YES ☐ | NO ☒ | |
| 4. | ANY DELAMINATION (COATING)? | YES ☐ | NO ☒ | |
| 5. | ANY EMBRITTLEMENT (COATING)? | YES ☒ | NO ☐ | at high spots, where coating applied excessively at elbow transition to horizontal and toward elbow intrados |
| 6. | ANY EMBEDDED ROCKS (COATING AND/OR METAL)? | YES ☐ | NO ☒ | |
| 7. | ANY CRACKING (COATING AND/OR METAL)? | YES ☒ | NO ☐ | small, fine cracks in top layer of wrap, but no unprotected metal |
| 8. | ANY RUST (METAL)? | YES ☐ | NO ☐ | n/a |
| 9. | ANY CORROSION (METAL)? | YES ☐ | NO ☐ | n/a |
| 10. | ANY FLAKING OR SCALING (METAL)? | YES ☐ | NO ☐ | n/a |
| 11. | ANY MECHANICAL DAMAGE (METAL)? | YES ☐ | NO ☐ | n/a |
| 12. | ANY NICKS, GOUGES OR ARC STRIKES (METAL)? | YES ☐ | NO ☐ | n/a |
| 13. | ANY TUBERCLES (METAL – IF INTERNAL INSPECTION)? | YES ☐ | NO ☐ | n/a |

GENERAL APPEARANCE (Inspector):
Approximately 12 linear feet of piping was excavated and inspected. The inspected piping included horizontal and vertical sections and included a 90 degree elbow. In general, the coating on the straight horizontal and vertical sections of pipe had been uniformly applied. The outer pipe wrap layers appearance was uniform (no wrinkles) and the edges were well sealed with coating material. There was no noticeable deterioration or gaps in the coating, The coating and tape wrap at the access point was generally well adhered to the pipe, with little separation of the tape edges. One exception was at the 12 o'clock position, but here, the tape separation was limited only to the top tape layer, and the coating and wrap beneath appeared sound. The access point flanges and bolting appeared in good condition, with the hex nuts' edges remaining square, with little corrosion. A CR was written for the coating degradation observed on both lines 408 and 409. The coating and outer pipe wrap at the elbow and its transition to the horizontal pipe section was problematic for both elbows, but with Line 408 elbow being exhibiting the more dramatic coating degradation. At the sides of the horizontal pipe at the transition coating appeared unevenly applied and excessively. CR-IP2-2011-0248 was written for the coating degradation observed on both lines 408 and 409. The results of this inspection should consider the post-mod configuration of the piping inspected, as discussed under "FUTURE MONITORING."

DEGRADATION FOUND? YES ☒ NO ☐ CR-IP2-2011-06248

FURTHER EVALUATION REQUIRED? YES ☒ NO ☐

**ATTACHMENT 7.1** **INSPECTION CHECKLIST**

Sheet 2 of 2

COMMENTS (Inspector): Opportunistic inspection of As-Found coating condition of section of 24-in. SW Lines 408 & 409, excavated under EC 25313. The initial inspection was performed on 11/23/11, with a subsequent inspection by the IPEC coatings specialist of the as-found condition performed on 12/1/11. See attached e-mails for inspection notes by the Underground Piping & Tank Program engineer and the coatings engineer.
Piping is to be UT'd and guided wave inspected as part of assessment of this piping.

INSPECTOR(S) PRINT/SIGN/DATE: M. Terpening 12/15/11

EVALUATION: ACCEPTABLE ☐ ACCEPTABLE WITH DEFICIENCIES ☒ UNACCEPTABLE ☐

RECOMMENDED ACTION (Program Owner):

FUTURE MONITORING: ☐

Not required. The visual inspection performed is one element of a focused inspection of SW Line 409. Due to the coating degradation noted on both 24-inch Lines 408 and 409, a subsequent inspection by the IPEC coatings specialist was performed. The other elements that will be used to assess this piping will be direct UT and guided wave inspection of this piping. It should be noted that SW Lines 408 and 409 were excavated for mod EC 25313 (2R20 mod) which installs a concrete vault around the piping, and removes the existing 14-inch blind flanged access point, and installs larger 20-inch blind flanged access point in SW Line 409. A similar mod will modify SW Line 408 in the future. However, following concrete vault installation, the piping exposed by this excavation will in the future, no longer be subject to soil/pipe corrosion mechanisms. Therefore, the results of this inspections will provide data to assess this class of piping under the UPT Program, but as the piping will no longer be in contact with soil, future inspection of this piping will not be required. Coating deficiencies will be addressed and the protected as required by the applicable piping and coating specifications.

PREVENTIVE MAINTENANCE: ☐

None required for this specific location, as it will no longer be subject to soil/pipe corrosion effects. Additional piping inspections of the Service Water system will be performed, as required to meet Underground Piping & Tank Program requirements.

CORRECTIVE ACTIONS: ☐

None. The piping and new access point will be externally protected per applicable piping specifications under the EC installation.

PHOTOGRAPHIC OR VIDEO RECORDS ATTACHED? YES ☒ NO ☐

PROGRAM OWNER PRINT/SIGN/DATE: Robert C. Lee 12/15/11

INSPECTION NOTES BY PROGRAM OWNER

**Lee, Robert C**

**From:** Lee, Robert C
**Sent:** Wednesday, November 23, 2011 3:33 PM
**To:** Azevedo, Nelson F; Guarnaccia, Stephen; Tesoriero, Michael V
**Cc:** Beasley, Thomas J; DeChristopher, Mike; Tesoriero, Michael V; Peterson, Joseph F; Vasely, Michael J; Terpening, Michael; Kempski, Michael
**Subject:** SW Line 408 & 409 Visual Inspection - As-Found Coating Condition - In a nutshell

**Attachments:** IMG_0623.jpg; IMG_0585.jpg; IMG_0621.jpg; IMG_0628.jpg; IMG_0609.jpg; IMG_0606.jpg; IMG_0604.jpg; IMG_0613.jpg; IMG_0614.jpg; IMG_0624.jpg; IMG_0625.jpg; IMG_0626.jpg

Mike Terpening conducted the visual as-found inspection of the coating of SW Lines 408 & 409 at the access point mod excavation on Wed afternoon.
I'd like Steve Guarnaccia to examine the areas of the piping that exhibited degraded coating condition, as detailed below, next week. A CR should be will be written after the follow-up coating inspection.

In general, it looked like the coating on the straight section was uniformly applied and is holding up. The Coating at the access point branch connect also looked OK. The coating at the elbows, however, looked to have been applied non-uniformly, and in some spots, excessively. Perhaps resulting in poor cure, air gaps, etc. Need Steve G. to inspect and weigh in.

Mike Kempski - see bottom for 26 CWP discharge pipng photos.

The following is a summary of the inspection, additional photos are available:

The horizontal sections (tops and bottoms) of the two 24-inch headers were generally in good condition. The layers of overwrap could be seen with a layer of coating to seal the edges of the edges of the overwrap.


IMG_0623.jpg (680 KB)


IMG_0585.jpg (733 KB)


IMG_0621.jpg (405 KB)

There were no obvious sign of missing or degraded coating, except for:

- On Line 408 (river side) have one area (approx. 4 sq. in) on the underside of the straight section of pipe that separated from the pipe and came off with the application of moderate finger pressure.


IMG_0628.jpg (639 KB)

- Line 408 90 deg elbow, at the inner radius, had an area of coating that had separated from the pipe and came apart upon application of finger pressure. When probed the area of coating that had come off was estimated to be approx. a one ft. square.


IMG_0609.jpg (527 KB)

The coating at the access point branch connections appeared to be carefully and methodically applied, although there was incomplete tape adhesion at the edges on Line 408.

IMG_0606.jpg (748 KB)

The quality of the Line 409 coating and wrap at the access point branch connection was slightly, but noticeably better.

IMG_0604.jpg (754 KB)

The bolting hardware at the access point blind flanges for Line 408 was corroded. Picture of 409 acces pt also provided.

IMG_0613.jpg (671 KB)

IMG_0614.jpg (723 KB)

Also exposed was the adjacent 26 Circ Water Discharge pipe (84-in. dia.) Although formal inspection was not conducted (I want to have it performed next week, while the excavation remains open) the exposed coating looked good

IMG_0624.jpg (699 KB)

IMG_0625.jpg (944 KB)

IMG_0626.jpg (595 KB)

Bob

**Lee, Robert C** COATINGS ENGINEER

**From:** Guarnaccia, Stephen

**Sent:** Thursday, December 01, 2011 11:11 AM

**To:** Culeton, Thomas

**Cc:** Beasley, Thomas J; Lee, Robert C; Pineda, Juan J; Drake, Richard S; Skonieczny, John F; Arcate, John

**Subject:** Service Water Piping Coating

Tom,

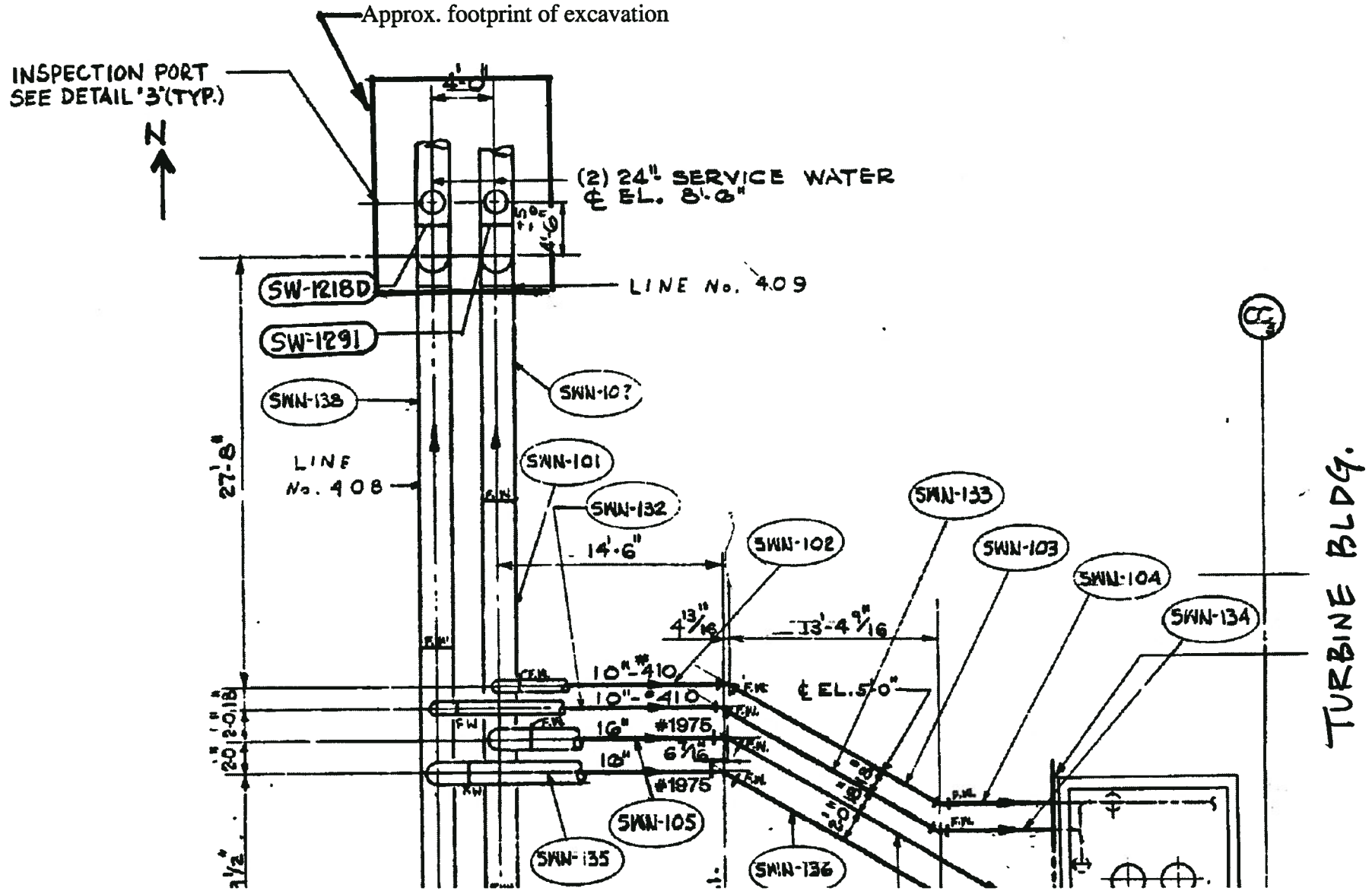
I inspected the coatings on service water lines 408 & 409 in the excavation on the riverfront. For the most part the coatings are in fairly good shape. My main concern is for the condition of the elbow on Line 408, riverside pipe, for the proper application of a coating repair. Thus this elbow needs to be stripped of the existing coating and wrap down to the pipe. The condition of the surface shall be roughened for the application of the new coating repair system. The inspection sites and the adjacent several inches of coatings shall also be roughened for the acceptance of the new coating.

Since the temperatures are trending down below 50 deg. F the standard system of coating can not be used. I'm referring to the Carboline 300M product which will not cure at these lower temperatures. Carboline has suggested the use of Carbomastic 615 which has not been previously used here on site. The VOC content is acceptable but the coating will need to be approved for use by Chemistry. I will generate the paperwork to add the 615 to the ACL today.

Thanks for your support,
Steve x6609

IP2 Service Water Lines 408 & 409 Inspections (Nov. 2011)

Ref: drawing 9321-2700



84-in. Circulating Water Pipe
flow is to the Turbine Building
(east)
14-in. blind flanged
access point
24-inch SW Line 408
flow is to the left (North)
24in SW Line 409
flow is to the left
(North)
11/28/2011 12:18


24"3W LINE 409

2" STATION AIR LINE CROSSING @ 90°


11/23/2011 14:45


11/23/2011 14:46


11/23/2011 14:46


ACCESS POINT ↓
NORTH END ↑
11/23/2011 14:46


11/23/2011 14:46


11/23/2011 14:49


LINE 408 ↓ ↑ LINE 409 ↓


FINE CRACKS IN TOP LAYER OF WRAP