



Indiana Utility Regulatory Commission
Pipeline Safety Division

2010 Master Meter Operator Compliance Seminar **November 4, 2010**

Corrosion Control Activities

Corrosion Control Activities

192 Subpart I addresses the requirements for
Corrosion Control

Are procedures satisfactory?

- Do you have procedures describing all the corrosion control activities to be performed on your gas piping?
- Are the people performing these tasks qualified?
(§192.453 General. The corrosion control procedures required by §192.605(b)(2), including those for the design, installation, operation, and maintenance of cathodic protection systems, **must be carried out by, or under the direction of, a person qualified in pipeline corrosion control methods.**)

External Corrosion Control

192.465 External corrosion control: Monitoring

(a) Each pipeline that is under cathodic protection must be **tested at least once each calendar year, but with intervals not exceeding 15 months**, to determine whether the cathodic protection meets the requirements of §192.463...

- What does the code require?

As stated above, CP pipe to soil surveys

- What does the IURC expect?

Same as above

- What are we seeing?

The soil-to-air interface needs more attention, including disbonded coating. Anodes may not always solve the problem. It may require more expertise.

Remedial Action

Repairs and Anodes

§192.487 Remedial measures: Distribution lines...

(a) General corrosion... Each segment of **generally corroded distribution line pipe** with a **remaining wall thickness less than that required for the MAOP** of the pipeline, **or a remaining wall thickness less than 30 percent of the nominal wall thickness, must be replaced.**

However, corroded **pipe may be repaired** by a method that reliable engineering tests and analyses show **can permanently restore the serviceability** of the pipe. Corrosion pitting so closely grouped as to affect the overall strength of the pipe is considered general corrosion for the purpose of this paragraph.

(b) Localized corrosion pitting.... Each segment of distribution line **pipe with localized corrosion pitting to a degree where leakage might result must be replaced or repaired.**

Remedial Measures cont.

- **§192.465** (d) Each operator shall take prompt remedial action to correct any deficiencies indicated by the monitoring.

External Corrosion Control

- What does the code require?

Remedial action – replace or repair corroded pipe.

As a rule- If the cathodic protection is measured more positive than -0.850mV then insulated unions must be checked or anodes added to the system.

- What does the IURC expect?

Each operator shall take prompt remedial action to correct any deficiencies indicated by the monitoring.

We expect remedial action within one year of time of discovery or next CP survey period.

- What are we seeing?

Inconsistent action.

Atmospheric Corrosion

§192.481

§192.479

§192.481 Atmospheric corrosion control: Monitoring.

- (a) Each operator must inspect each pipeline or portion of pipeline that is exposed to the atmosphere for evidence of atmospheric corrosion, as follows:**

Code states: At least once every 3 calendar years, but with intervals not exceeding 39 months

- (b) During inspections the operator must give particular attention to pipe at soil-to-air interfaces, under thermal insulation, under disbonded coatings, at pipe supports, in splash zones, at deck penetrations, and in spans over water.**
- (c) If atmospheric corrosion is found during an inspection, the operator must provide protection against the corrosion as required by Sec. 192.479.**

§192.479 Atmospheric corrosion control; General.

- (a) Each operator must clean and coat each pipeline or portion of pipeline that is exposed to the atmosphere...**

- (b) Coating material must be suitable for the prevention of atmospheric corrosion.**

Atmospheric Corrosion

- What does the code require?

Conduct every 3 years and monitor per code

Recommend yearly during annual leak surveys

- What does the IURC expect?

For those that use consultants, review their submitted documentation for any remedial action items. We expect remedial action within one year of time of discovery or next survey period.

- What are we seeing?

The soil-to-air interface needs more attention. Disbonded coating can hold water next to the pipe and cause severe rusting and delaminating of the steel.

Visual Inspections

of Underground Piping

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§192.459 External corrosion control: Examination of buried pipeline when exposed.

Whenever an operator has knowledge that any portion of a buried pipeline is exposed, the **exposed portion must be examined for evidence of external corrosion if the pipe is bare, or if the coating is deteriorated.** If external corrosion requiring remedial action under Secs. 192.483 through 192.489 is found...

§192.475 Internal corrosion control: General.

- (b) **Whenever any pipe is removed** from a pipeline for any reason, the **internal surface must be inspected for evidence of corrosion**. If internal corrosion is found-
- (1) The adjacent pipe must be investigated to determine the extent of internal corrosion:
 - (2) Replacement must be made to the extent required by the applicable paragraphs of §§192.485, 192.487, or 192,489; and,
 - (3) Steps must be taken to minimize the internal corrosion.

Visual Inspections of Underground Piping

- What does the code require?

Requires that the exposed pipe be examined for coating and corrosion issues. Document findings

- What does the IURC expect?

Any time a leak is repaired below ground, an exposed line exists, a section of pipe replaced, a Pipe Exam (visual) form must be completed. Excellent opportunity to verify maps and records as well.

- What are we seeing?

Very few visual inspections being performed.

Records Retention

§192.491

§192.491 Corrosion control records.

- (a) Each operator shall maintain records or maps to show the location of cathodically protected piping, cathodic protection facilities, galvanic anodes, and neighboring structures bonded to the cathodic protection system. Records or maps showing a stated number of anodes, installed in a stated manner or spacing, need not show specific distances to each buried anode.**
- (b) Each record or map required by paragraph (a) of this section must be retained for as long as the pipeline remains in service.**
- (c) Each operator shall maintain a record of each test, survey, or inspection required by this subpart in sufficient detail to demonstrate the adequacy of corrosion control measures or that a corrosive condition does not exist. These records must be retained for at least 5 years, except that records related to §§192.465(a) and (e) and 192.475(b) must be retained for as long as the pipeline remains in service.**

Corrosion control records

- §192.1011 What records must an operator keep?

An operator **must maintain records** demonstrating compliance with the requirements of this subpart **for at least 10 years**. The records must include copies of superseded integrity management plans developed under this subpart.

[Amdt. 192-113, 74 FR 63905, December 4, 2009]

Records Retention

- What does the code require?

Since the records of pipe-to-soil readings and internal corrosion are to remain for the life of the pipe, these records must be transferred to a new owner or management company.

- What does the IURC expect?

Expect records to be accurate and retrievable at time of inspection

- What are we seeing?

Records not available at time of inspection. Incomplete information when reviewed. Poor transfer of records from previous owners.

Corrosion- Be Serious??

- Corrosion is the **second leading cause** for natural gas pipeline reportable incidents. The first is third party damage.
- Items to be on the lookout for in your gas system.

Disbonded Coating



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Disbonded and pipe wall loss



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Ground interface corrosion



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Cracked coating at ground level



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Pipe wall loss- Extensive



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