

July 24, 1986

Mr. E. Scott Smith  
Chief Engineer  
Public Service Commission  
730 Schenkel Lane  
Post Office Box 615  
Frankfort, Kentucky 40602

Dear Mr. Smith:

Your letter of June 17, 1986, asks, "should a distribution company have a specific program whereby the inspection and electrical test of cased road crossings on cathodically protected lines would be conducted annually, or can compliance with the 192.467(c) and (d) be achieved by complying with 192.465(a), even though test stations are not always located at the cased crossings and test of the bare casing is not taken?"

When properly conducted the testing under §192.465(a) would also establish compliance with §192.467(c) and (d).

Section 192.465(a) states "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...." The tests under §192.465(a) must be sufficient to determine whether the cathodic protection meets the requirements of §192.463 for the entire pipeline, including any cathodically protected segments inside casings. If the tests under §192.465(a) show that the cathodic protection of a cased segment is adequate, then §192.467(d) has been satisfied because the electrical isolation must also be adequate, and compliance with §§192.467(a) and (c) has been achieved. If §192.465(a) tests show inadequate protection of any cased segment, then additional inspection and tests would be needed under §192.467(d) to determine the adequacy of electrical isolation.

For your information we are enclosing a copy of the "Regulation Enforcement Guidelines" for §192.467 that was prepared by OPS enforcement staff in 1983.

Sincerely,

Richard L. Beam  
Associate Director  
Pipeline Safety Regulation

REGULATION ENFORCEMENT GUIDELINES  
192.467 EXTERNAL CORROSION CONTROL: ELECTRICAL ISOLATION

Electrically shorted casing

1. A violation of Paragraph 192.467(c) exists if:

A cathodically protected transmission or distribution pipeline, other than unprotected copper inserted into ferrous pipe, is electrically connected to metallic casings that are a part of the underground system and within six months of discovery of the electrical short between the casing and pipeline, the operator has not initiated corrective action in accordance with Paragraph 3 below. Discovery shall be presumed upon conduct of on [sic] electrical survey with results as described in Paragraphs 2(a) and 2(b).

The operators Operation and Maintenance Plan should also be investigated to:

- A. determine that the operator has a procedure to react to shorted casings per 192.605, and;
  - B. follows that procedure per 192.13(c)
2. Evidence of violation - Paragraph 192.467(c):
    - A. Documentation and dates of pipe-to-soil potential surveys made pursuant to Section 192.465 that show pipe-to-soil and adjacent casing-to-soil potentials to be essentially the same, indicating an electrical short between casing and pipe.
    - B. Documentation and dates of casing-to-soil potential measurements which are more negative than normal, but not as negative as adjacent pipe-to-soil potential measurements, indicating a "partial" electrical short between casing and pipe.

Notes:

A zero resistant short, as in (a) prevents cathodic protection from reaching the pipeline inside the casing and thus prevents the operator from complying with Paragraphs 192.455(a)(2), and 192.457(a) for those pipe sections.

A "partial" short, as in (b) reduces the amount of cathodic protection current to the pipeline. It is not practical to determine the degree of protection

received by the pipe inside a "partially" shorted casing for compliance with Paragraph 192.463(a).

C. Field checks:

- i). At locations where pipe-to-soil and adjacent casing-to-soil measurements are essentially the same, the presence of an electrical short can be readily checked by connecting one output terminal of pipe locator transmitter to the pipeline and the other to the casing (this utilizes the conductive mode). Then move the receiver out to a point over the pipeline about 50 to 100 feet away from the casing. If no signal is picked up, the casing is shorted to the pipe. Also, determine if connecting test leads from casing and pipe together has any effect on signal strength. It should not. However, there will be a change in signal strength if the casing is partially shorted to the pipeline.
- ii). Have operator interrupt rectifier located some distance away from shorted or partially shorted casing; at least a mile away would be preferable. If it has to be closer, be sure that casing pipe at point of measurement is not within the voltage gradient of the rectifier groundbed.

These interrupted voltage checks will serve to verify the presence of a short or partial short between casing and pipe.

D. Operator records:

- A. Pipe-to-soil and casing-to-soil potential measurements should be retained by the operator in accordance with Paragraph 192.491(b)(2).

E. Operator's O&M Plan:

- A. To comply with the requirements of Sections 192.467(c), 192.453, and 192.605, the operator's O&M Plan must incorporate procedures to be used for correcting or negating the adverse effects of shorted casings. Then, consistent with Paragraph 192.13(c), the operator is to follow the procedures that it has established.

3. Reasonable time allowance and method for operator's correction of shorted casings:

A. After the cathodic protection survey has been completed and a shorted casing has been identified, the operator should determine a course of action intended to correct or negate the adverse effects of shorted casings. The operator's plan of action should be initiated within six months of completion of the survey and should include one of the following options:

- i). Clear the short if practical;
- ii). Fill the casing/pipe interstice with high dielectric casing filler or other material which provides a corrosion inhibiting environment.
- iii). If options i or ii would be impracticable and, if in the judgement of the operator the risk of corrosion is minimized by conditions including the location and condition of the pipe, the risk of overpressure, and environmental factors, the operator may choose to monitor the casing with leak detection instruments at intervals not exceeding the requirements of 192.705 and 192.721 until such time as options i or ii become practicable or conditions change which render option iii inadequate to minimize the risk of corrosion.

If the operator chooses to monitor the shorted casing with leak detection instruments, immediate corrective action must be taken if and when a leak is discovered. A corrosion leak is a condition that would render option iii inadequate.

E. In connection with the use of inhibitors in the water between shorted casing and pipe, the operator should demonstrate that galvanic currents cannot flow. Otherwise, corrosion will take place.

If the inhibitor is effective, the operator should also be able to demonstrate by periodic sampling that the inhibitor will stay in the casing/pipe interstice without leaching out the ends into the soil during low water tables.

4. Road and Railroad casings are in areas where continuing pipeline corrosion is considered to be detrimental to public safety.

- A. The OOE Pipeline Safety Enforcement Manual, page 14d (Rev. 1/19/81), under Part D relative to definition and enforcement guidelines for Paragraph 192.457(c), provide the following guide material:

"In order to achieve uniform enforcement policy, all regions should consider continuing corrosion occurring in the following areas to be detrimental to public safety (active corrosion):

- 1. . . .
- 2. . . .
- 3. At highway and railroad crossings.
- 4. . . .

- B. Thus, all highway and railroad crossings involving cathodically protected gas pipelines must be electrically isolated from the casing, or other measures must be used to mitigate [sic] or monitor galvanic corrosion of the pipeline inside the shorted casings.

5. General notes:

- A. To cathodically protect a pipeline means to cathodically protect it in its entirety. It should be noted that a pipeline is not protected in its entirety, as required by 192.455 or 192.457, whenever casings are shorted to the pipelines because of the shielding effect of the casings that prevents cathodic protection current from reaching the pipeline inside the casing.

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June 17, 1986

Mr. Richard L. Beam, Director  
Office of Pipeline Safety Regulation  
Materials Transportation Bureau  
400 Seventh Street, S.W.  
Washington, D.C. 20590

Dear Mr. Beam:

Columbia Gas of Kentucky, Inc. (Columbia) is an intrastate natural gas distribution company and is jurisdictional to this Commission through our 5a agreement. While conducting a comprehensive inspection of one of its districts, our inspector discovered that Columbia does not have a specific program of inspecting and electrically testing carrier pipe at cased crossings or the casing to assure that it is not shorted or partially shorted.

To comply with 192.467(c) and (d), it appears that specific tests must be conducted at these locations on a periodic (annual) basis.

This is a request for interpretation of the following regulations:

49 CFR 192.467(a) states:

"Each buried or submerged pipeline must be electrically isolated from other underground metallic structures, unless the pipeline and the other structures are electrically interconnected and cathodically protected as a single unit."

49 CFR 192.467(c) states:

"Except for unprotected copper inserted in ferrous pipe, each pipeline must be electrically isolated from metallic casings that are a part of the underground system. However, if isolation is not achieved because it is impractical, other measures must be taken to minimize corrosion of the pipeline inside the casing."

49 CFR 192.467(d) states:

"Inspection and electrical tests must be made to assure that electrical isolation is adequate."

Should a distribution company have a specific program whereby the inspection and electrical test of cased road crossings on cathodically protected lines would be conducted annually, or can compliance with the 192.467(c) and (d) be achieved by complying with 192.465(a), even though test stations are not always located at the cased crossings and test of the bare casing is not taken?

Sincerely,

E. Scott Smith, Chief Engineer