

Subpart I

Requirements for Corrosion Control

§ 192.451 **Scope**

- (a) This subpart prescribes minimum requirements for the protection of metallic pipelines from external, internal, and atmospheric corrosion.

§ 192.452 Applicability to Converted Pipelines

Notwithstanding the date the pipeline was installed or any earlier deadlines for compliance, each pipeline which qualifies for use under this part in accordance with § 192.14 must meet the requirements of this subpart specifically applicable to pipelines installed before August 1, 1971, and all other applicable requirements within 1 year after the pipeline is readied for service. However, the requirements of this subpart specifically applicable to pipelines installed after July 31, 1971, apply if the pipeline substantially meets those requirements before it is readied for service or it is a segment which is replaced, relocated, or substantially altered.

Approved: Signature on file Date: _____
 Manager, Safety, Health, and Environmental

Approved: Signature on file Date: _____
Environmental Manager

ESI RESPONSE TO § 192.452

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Reference ESI's "Gas Transmission Pipelines Plant Engineering Specification" DOT-006, Section 9.5 Pipeline Service Conversions. This section summarizes requirements to allow the Company to operate a pipeline previously used for service not covered by ASME/ANSI B31.8 to qualify the pipeline for service as a gas transmission pipeline under B31.8:

**Historical Records Study
Requirements for Conversion to Gas Service
Conversion Procedure
Records of Conversion**

<u>Documentation</u>	<u>Location Filed</u>
RKPG	
<u>Pre-DOT Construction/Maintenance Records A-1</u>	<u>DOT Files</u>
RKPG	
<u>Post-DOT Construction/Maintenance Records A-2</u>	<u>DOT Files</u>

§ 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.

ESI RESPONSE TO § 192.453

Minimum requirements and procedures for corrosion control of above-ground, buried, and submerged DOT-regulated pipelines are summarized in the ESI Plant Engineering Specification "Corrosion Control and Monitoring" DOT-005, section 10 of ESI's "Gas Transmission Pipelines Plant Engineering Specifications" DOT-006. ANSI/ASME B31.8 also contains requirements applicable to the design and installation of new piping systems and to the operation and maintenance of existing pipeline systems. Provisions for the corrosion control of DOT-regulated gas transmission pipelines shall be administered under the direction of competent corrosion control personnel. Minimum qualifications for supervisory work include NACE accreditation as a Corrosion Specialist with 10 years experience in all phases of corrosion control in gas transmission pipeline systems.

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<u>Documentation</u>	<u>Location Filed</u>
RKPG <u>Employees' Qualification Records</u> C-3	<u>Personnel Files</u>
RKPG <u>Rectifier Readings</u> D-1	<u>DOT Files</u>
RKPG <u>Pipe-To-Soil Potential Survey</u> D-2	<u>DOT Files</u>
RKPG <u>Contractors' Qualification Record</u> G-F	<u>DOT Files</u>

§ 192.455 External Corrosion Control: Buried or Submerged Pipelines Installed After July 31, 1971

- (a) Except as provided in paragraphs (b), (c), and (f) of this section, each buried or submerged pipeline installed after July 31, 1971, must be protected against external corrosion, including the following:
- (1) It must have an external protective coating meeting the requirements of § 192.461.
 - (2) It must have cathodic protection system designed to protect the pipeline in accordance with this subpart, installed and placed in operation within 1 year after completion of construction.

ESI RESPONSE TO § 192.455

All new buried pipe installed will be coated and cathodically protected as part of the construction project. Cathodic protection systems will be commissioned prior to acceptance of the pipeline.

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- (2) It must have a cathodic protection system designed to protect the pipeline in its entirety in accordance with this subpart, installed and placed in operation within one year after completion of construction.

ESI RESPONSE TO § 192.455

Soil conditions in Lake Charles are corrosive, therefore, cathodic protection systems will be installed in accordance with ESI's "Corrosion Control and Monitoring Plant Engineering Specification" DOT-005. Cathodic protection design data will be filed in ESI I & E Department and in the DOT files.

- (b) An operator need not comply with paragraph (a) of this section, if the operator can demonstrate by tests, investigation, or experience in the area of application, including, as a minimum, soil resistivity measurements and tests for corrosion accelerating bacteria, that a corrosive environment does not exist. However, within 6 months after an installation made pursuant to the preceding sentence, the operator shall conduct tests, including pipe-to-soil potential measurements with respect to either a continuous reference electrode or an electrode using close spacing, not to exceed 20 feet, and soil resistivity measurements at potential profile peak locations, to adequately evaluate the potential profile along the entire pipeline. If the tests made indicate that a corrosive condition exists, the pipeline must be cathodically protected in accordance with paragraph (a)(2) of this section.
- (c) An operator need not comply with paragraph (a) of this section, if the operator can demonstrate by tests, investigation, or experience that---
 - (1) For a copper pipeline, a corrosive environment does not exist; or
 - (2) For a temporary pipeline with an operating period of service not to exceed 5 years beyond installation, corrosion during the 5-year period of service of the pipeline will not be detrimental to public safety.
- (d) Notwithstanding the provisions of paragraph (b) or (c) of this section, if a pipeline is externally coated, it must be cathodically protected in accordance with paragraph (a)(2) of this section.

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- (e) Aluminum may not be installed in a buried or submerged pipeline if that aluminum is exposed to an environment with a natural pH in excess of 8, unless tests or experience indicate its suitability in the particular environment involved.
- (f) This section does not apply to electrically isolated, metal alloy fittings in plastic pipelines, if:
 - (1) For the size fitting to be used, an operator can show by test, investigation, or experience in the area of application that adequate corrosion control is provided by the alloy composition; and
 - (2) The fitting is designed to prevent leakage caused by localized corrosion pitting.

ESI RESPONSE TO § 192.455

All buried or submerged metallic pipelines will receive corrosion protection based on the requirements of the ESI Plant Engineering Specification “Corrosion Control and Monitoring” DOT-005.

<u>Documentation</u>	<u>Location Filed</u>
RKPG <u>Post-DOT Construction/Maintenance Records A-2</u>	<u>DOT Files</u>
RKPG <u>Rectifier Readings</u> D-1	<u>DOT Files</u>
<u>Documentation</u>	<u>Location Filed</u>
RKPG <u>Pipe-to-Soil Potential Survey</u> D-2	<u>DOT Files</u>
RKPG <u>Galvanic Anode Bed Readings</u> D-6	<u>DOT Files</u>

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§ 192.457 External Corrosion Control: Buried or Submerged Pipelines Installed Before August 1, 1971

- (a) Except for buried piping at compressor, regulator, and measuring stations, each buried or submerged transmission line installed before August 1, 1971, that has an effective external coating must be cathodically protected along the entire area that is effectively coated, in accordance with this subpart. For the purposes of this subpart, a pipeline does not have an effective external coating if its cathodic protection current requirements are substantially the same as if it were bare. The operator shall make tests to determine the cathodic protection current requirements.
- (b) Except for cast iron or ductile iron, each of the following buried or submerged pipelines installed before August 1, 1971, must be cathodically protected in accordance with this subpart in areas in which active corrosion is found:
- (1) Bare or ineffectively coated transmission lines.
 - (2) Bare or coated pipes at compressor, regulator, and measuring stations.
 - (3) Bare or coated distribution lines. The operator shall determine the areas of active corrosion by electrical survey, or where electrical survey is impractical, by the study of corrosion and leak history records, by leak detection survey, or by other means.
- (c) For the purpose of this subpart, active corrosion means continuing corrosion which, unless controlled, could result in a condition that is detrimental to public safety.

ESI RESPONSE TO § 192.457

ESI DOT buried gas transmission pipelines will be cathodically protected.

§ 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,

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or if the coating is deteriorated. If external corrosion is found, remedial action must be taken to the extent required by § 192.483 and the applicable paragraphs of §§§ 192.485, 192.487, or 192.489.

ESI RESPONSE TO § 192.459

When a pipeline is exposed for any reason, the pipeline will be examined by the Inspection Department for evidence of external corrosion and coating deterioration.

DocumentationLocation Filed

RKPG

P/L Patrol/Leak/Marker Insp.Reports E-1DOT Files**§ 192.461 External Corrosion Control: Protective Coating**

- (a) Each external protective coating, whether conductive or insulating, applied for the purpose of external corrosion control must---
 - (1) Be applied on a properly prepared surface;
 - (2) Have sufficient adhesion to the metal surface to effectively resist underfilm migration of moisture;
 - (3) Be sufficiently ductile to resist cracking;
 - (4) Have sufficient strength to resist damage due to handling and soil stress; and
 - (5) Have properties compatible with any supplemental cathodic protection.
- (b) Each external protective coating which is an electrically insulating type must also have low moisture absorption and high electrical resistance.

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- (c) Each external protective coating must be inspected just prior to lowering the pipe into the ditch and backfilling, and any damage detrimental to effective corrosion control must be repaired.
- (d) Each external protective coating must be protected from damage resulting from adverse ditch conditions or damage from supporting blocks.
- (e) If coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation.

ESI RESPONSE TO § 192.461

Steel pipelines will be coated and installed with a nonconductive coating material that meets the criteria of ANSI/ASME B31.8 section 862.112.

EXTERNAL CORROSION CONTROL: PROTECTIVE COATING**COATING AND WRAPPING MATERIALS:**

New types or modifications of present types of protective coatings and materials shall be approved by ESI's LCCC Engineering Department.

Test result on new material shall be initiated by the Technology Managers or Project Manager. Qualifying test shall be performed in accordance with industry standards. Reference Standards listed in appendix A "Coating Reference Index" in the ESI's "Corrosion Control and Monitoring Plant Engineering Specification" DOT-005.

COATING INSPECTION:

Qualified personnel shall assure compliance with provisions of this section.

Each protective coating shall be inspected in accordance with established practices at the time of application and when the pipe is installed. In addition to the requirements of § 192.461, the following shall also apply to coating inspections.

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- (a) The girth welds shall be inspected for irregularities that could protrude through the pipe coating material. Any such irregularities must be removed.
- (b) Coating personnel shall be suitably instructed and provided with all the equipment necessary to coat the pipe and evaluate the completed application of coating and patching.
- (c) Where backfilling does not follow directly behind the lowering of the pipe in a ditch, the protective coating shall be inspected just prior to backfilling.

EXTERNAL CORROSION CONTROL: PROTECTIVE COATING**STORAGE:**

Wrapping and reinforcing materials shall be stored under cover in a dry place and kept from contact with dampness. Any coating material which shows evidence of deterioration or damage shall not be used.

<u>Documentation</u>		<u>Location Filed</u>
RKPG		
<u>Post-DOT Construction/Maintenance Records A-2</u>		<u>DOT Files</u>
RKPG		
<u>Employees' Qualification Records</u>	<u>C-3</u>	<u>DOT Files</u>

§ 192.463 **External Corrosion Control: Cathodic Protection**

- (a) Each cathodic protection system required by this subpart must provide a level of cathodic protection that complies with one or more of the applicable criteria contained in appendix D of this part. If none of these criteria is applicable, the cathodic protection system must provide a level of cathodic protection at least equal to that provided by compliance with one or more of these criteria.

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- (b) If amphoteric metals are included in a buried or submerged pipeline containing a metal or different anodic potential---
 - (1) The amphoteric metals must be electrically isolated from the remainder of the pipeline and cathodically protected; or
 - (2) The entire buried or submerged pipeline must be cathodically protected at a cathodic potential that meet the requirements of appendix D of this part for amphoteric metals.
- (c) The amount of cathodic protection must be controlled so as not to damage the protective coating or the pipe.

ESI RESPONSE TO § 192.463

The amount of protection must be controlled so as not to damage the protective coating or the pipe. The level of cathodic protection provided will be such that a negative voltage of at least 0.85 volts, with reference to a saturated copper-copper sulfate half cell exists.

Tests to determine the amount of cathodic protection current required in the field prior to actual installation of cathodic protection is necessary providing prior experience and test data is not available to estimate cathodic protection current requirements, resistivity, and corrosion interference problems to be expected. Reference Standard 38, NACE STD. RP-01-69.

DocumentationLocation Filed

RKPG

Rectifier ReadingsD-1DOT Files

RKPG

Pipe-to-Soil Potential SurveyD-2DOT Files**§ 192.465 External Corrosion Control: Monitoring**

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- (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. However, if tests at those intervals are impractical for separately protected short sections of mains or transmission lines, not in excess of 100 feet, or separately protected service lines, these pipeline may be surveyed on a sampling basis. At least 10 percent of these protected structures, distributed over the entire system must be surveyed each calendar year, with a different 10% checked each subsequent year, so that the entire system is tested in each 10-year period.
- (b) Each cathodic protection rectifier or other impressed current power source must be inspected six times each calendar year, but with intervals not exceeding 2-1/2 months, to insure that it is operating.
- (c) Each reverse current switch, each diode, and each interference bond whose failure would jeopardize structure protection must be electrically checked for proper performance six times each calendar year, but with intervals not exceeding 2-1/2 months. Each other interference bond must be checked at least once each calendar year, but with intervals not exceeding 15 months.
- (d) Each operator shall take prompt remedial action to correct any deficiencies indicated by the monitoring.
- (e) After the initial evaluation required by paragraphs (b) and (c) of § 192.455 and paragraph (b) of § 192.457, each operator shall, at intervals not exceeding 3 years, reevaluate its unprotected pipelines and cathodically protect them in accordance with this subpart in areas in which active corrosion is found. The operator shall determine the areas of active corrosion by electrical survey, or where electrical survey is impractical, by the study of corrosion and leak history records, by leak detection survey, or by other means.

DocumentationLocation Filed

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Post-DOT Construction/Maintenance Records A-2DOT Files

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Rectifier ReadingsD-1DOT Files**ESI RESPONSE TO § 192.465**

Any deficiency located during the annual (not to exceed 15 months) cathodic protection monitoring or routine inspections shall be reported to the Ethylene Terminal/Unit Manager immediately. Each rectifier will be checked monthly. Prompt remedial action should be taken. Otherwise, the problem will be assessed by the Ethylene Terminal/Unit Manager with consideration of any potential for a hazardous situation. The Ethylene Terminal/Unit Manager will then formulate a plan for correcting the deficiency with the aid of the Technology Manager if necessary. This plan will then be approved by the Ethylene Terminal/Unit Manager and implemented within 90 days of discovery. A waiver from the Office of Pipeline Safety is required to exceed this time period.

§ 192.467 External Corrosion Control: Electrical Isolation

- (a) 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.

ESI RESPONSE TO § 192.467

Buried or submerged pipelines will be electrically isolated from other underground metallic structures whenever practical. Interference testing will be performed and interference problems will be corrected in accordance to ESI's Plant Engineering Specification "Corrosion Control and Monitoring" DOT-005.

- (b) One or more insulating devices must be installed where electrical isolation of a portion of a pipeline is necessary to facilitate the application of corrosion control.
- (c) Except for unprotected copper inserted in a ferrous pipe, each pipeline must be electrically isolated from metallic casing that are a part of the underground

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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.

- (d) Inspection and electrical tests must be made to assure that electrical isolation is adequate.
- (e) An insulating device may not be installed in an area where a combustible atmosphere is anticipated unless precautions are taken to prevent arcing.
- (f) Where a pipeline is located in close proximity to electrical transmission tower footings, ground cables or counterpoise, or in other areas where fault currents or unusual risk of lightning may be anticipated, it must be provided with protection against damage due to fault currents or lightning, and protective measures must also be taken at insulating devices.

ESI RESPONSE TO § 192.467

Casing potentials will be monitored once each calendar year to detect shorts. These will be promptly investigated if the potentials are 100 mv or less.

If the casing potential indicates that the casing is shorted, the short will be verified and remedial action will be taken within 6 months of discovery. Every effort will be made to clear the short. If this is impractical, the casing/pipe interstice will be filled with high-dielectric casing filler or other material which provides a corrosion inhibiting environment.

An insulating device will not be installed in an area where combustible atmosphere is anticipated unless precautions are taken to prevent arcing. A combustible atmosphere may exist in an area defined as Class I or II by the National Electric Code.

Where a pipeline is located in close proximity to electrical transmission tower footings, ground cables or counterpoise, or in other areas where fault currents or unusual risk of lightning may be anticipated, it will be provided with protection. Protective measures will be taken at insulating devices.

§ 192.469 External Corrosion Control: Test Stations

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Each pipeline under cathodic protection required by this subpart must have sufficient test stations or other contact points for electrical measurement to determine the adequacy of cathodic protection.

ESI RESPONSE TO § 192.469

Test stations will be installed on casings to determine the adequacy of cathodic protection. The intervals (approximately 1 mile apart) will be frequent enough to obtain electrical measurements indicating the adequacy of the cathodic protection.

<u>Documentation</u>	<u>Location Filed</u>
RKPG <u>Post-DOT Construction/Maintenance Records</u>	<u>A-2</u> <u>DOT Files</u>
RKPG <u>Pipe-to-Soil Potential Survey</u>	<u>D-2</u> <u>DOT Files</u>
RKPG <u>Casing Status Summary</u>	<u>D-3</u> <u>DOT Files</u>

§ 192.471 External Corrosion Control: Test Leads

- (a) Each test lead wire must be connected to the pipeline so as to remain mechanically secure and electrically conductive.
- (b) Each test lead wire must be attached to the pipeline so as to minimize stress concentration on the pipe.
- (c) Each bared test lead wire and bared metallic area at point of connection to the pipeline must be coated with an electrical insulating material compatible with the pipe coating and the insulation on the wire.

ESI RESPONSE TO § 192.471

Each test lead wire will be connected to the pipeline so as to remain mechanically secure and electrically conductive while minimizing stress concentration on the pipe. Each bared

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test lead wire and bared metallic area at point of connection to the pipeline will be coated with an electrical insulating material compatible with the pipe coating and the insulation on the wire. NOTE: Place approximately 1 mile apart and locations will be shown on maps.

<u>Documentation</u>	<u>Location Filed</u>
RKPG	
<u>Post-DOT Construction/Maintenance Records A-4</u>	<u>DOT Files</u>
RKPG	
<u>Rectifier Readings</u>	<u>DOT Files</u>

§ 192.473 External Corrosion Control: Interference Currents.

- (a) Each operator whose pipeline system is subjected to stray currents shall have in effect a continuing program to minimize the detrimental effects of such currents.
- (b) Each impressed current type cathodic protection system or galvanic anode system must be designed and installed so as to minimize any adverse effects on existing adjacent underground metallic structures.

§ 192.475 Internal Corrosion Control: General

- (a) Corrosive gas may not be transported by pipeline, unless the corrosive effect of the gas on the pipeline has been investigated and steps have been taken to minimize internal corrosion.

ESI RESPONSE TO § 192.475

ESI will not transport any corrosive gas that would corrode the pipe or other components of its pipeline system, unless it has investigated the corrosive effect of the gas on the system and has taken adequate steps to mitigate corrosion. Quality Control tests are performed on product by the VISTA Laboratory:

East Laboratory runs tests: **Ethylene by GC 3 times a week for purity**
Hydrogen by GC once a week for purity

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VCM Laboratory runs tests on vinyl chloride tanks by GC 6 times a day for:

**Alkalinity
Hydrochloric Acid
Water**

VCM Laboratory runs tests on vinyl chloride spheres by GC 2 times a day for:

**Alkalinity
Hydrochloric Acid
Water
Iron
Color**

A vinyl chloride process sample is ran once a day for acidity and water.

- (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---

ESI RESPONSE TO § 192.475

Control of internal corrosion will be in accordance with NACE Std. RP-01-75, Recommended Practice for the “Control of Internal Corrosion in Steel Pipelines and Piping Systems,” and NACE Publ. 3D170 “Modern Electrical Methods for Determining Corrosion Rates.” Whenever a pipe segment is removed from a pipeline the internal surface will be inspected for evidence of corrosion.

- (1) The adjacent pipe must be investigated to determine the extent of internal corrosion:

ESI RESPONSE TO § 192.475

If the pipe is generally corroded such that the remaining wall thickness is less than the minimum thickness required by the pipe specification tolerances, ESI will investigate adjacent pipe in the same area, to determine the extent of the corrosion. Remedial action plans will be performed within 90 days.

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- (2) Replacement must be made to the extent required by the applicable paragraphs of §§§ 192.485, 192.487, or 192,489; and

ESI RESPONSE TO § 192.475

The corroded pipe will be replaced with pipe that meets the requirements of this part or, based on the actual remaining wall thickness, the operating pressure must be reduced to be commensurate with the limits on operating pressure.

- (3) Steps must be taken to minimize the internal corrosion.

ESI RESPONSE TO § 192.475

ESI will take all steps possible to minimize internal corrosion. Refer to ESI's "Gas Transmission Pipelines Plant Engineering Specification" DOT-006, section 10.3 Internal Corrosion Control and the "Corrosion Control and Monitoring Plant Engineering Specification" DOT-005.

- (c) Gas containing more than 0.25 grain of hydrogen sulfide per 100 standard cubic feet (4 parts per million) may not be stored in pipe-type or bottle-type holders.

<u>Documentation</u>	<u>Location Filed</u>
RKPG <u>Post-DOT Construction/Maintenance Rpts.A-2</u>	<u>DOT Files</u>
RKPG <u>Corrosion Coupon Reports</u> D-4	<u>DOT Files</u>
RKPG <u>DOT Determination Study for Gas</u> F-1	<u>DOT Files</u>
RKPG <u>Pipeline Data Reference Sheet</u> F-3	<u>DOT Files</u>
RKPG <u>P/L Patrol/Marker/Leak Insp. Reports</u> E-1	<u>DOT Files</u>

§ 192.477 Internal Corrosion Control: Monitoring

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If corrosive gas is being transported, coupons or other suitable means must be used to determine the effectiveness of the steps taken to minimize internal corrosion. Each coupon or other means of monitoring internal corrosion must be checked two times each calendar year, but with interval not exceeding 7-1/2 months.

ESI RESPONSE TO § 192.477

Control of internal corrosion will be in accordance with NACE Std. RP-01-75, Recommended Practice for the "Control of Internal Corrosion in Steel Pipelines and Piping Systems," and NACE Publ. 3D170 "Modern Electrical Methods for Determining Corrosion Rates." Quality Control analysis of product(s) are performed by ESI Laboratory.

DocumentationLocation Files

RKPG

Corrosion Coupon Reports D-4DOT Files**§ 192.479 Atmospheric Corrosion Control; General**

- (a) *Pipeline installed after July 31, 1971.* Each aboveground pipeline or portion of a pipeline installed after July 31, 1971 that is exposed to the atmosphere must be cleaned and either coated or jacketed with a material suitable for the prevention of atmospheric corrosion. An operator need not comply with this paragraph, if the operator can demonstrate by test, investigation, or experience in the area of application, that a corrosive atmosphere does not exist.
- (b) *Pipelines installed before August 1, 1971.* Each operator having an above-ground pipeline or portion of a pipeline installed before August 1, 1971 that is exposed to the atmosphere, shall---
- (1) Determine the areas of atmospheric corrosion on the pipeline;
 - (2) If atmospheric corrosion is found, take remedial measures to the extent required by the applicable paragraphs of §§§ 192.485, 192.487, or 192.489; and

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- (3) Clean and either coat or jacket the areas of atmospheric corrosion on the pipeline with a material suitable for the prevention of atmospheric corrosion.

ESI RESPONSE TO § 192.479

ESI will clean, coat with material suitable for the prevention of atmospheric corrosion, and maintain this protection for each component in its pipeline system that is exposed to the atmosphere. Above ground pressure piping and the supports upon which pressure piping is dependent shall be visually inspected for atmospheric corrosion each calendar year with intervals not to exceed 15 months.

If corrosion is discovered on pressure piping, determination of whether to re-coat, repair or replace shall be made according to ASME Guide Material Appendix G-6 "Determination of Maximum Size of Corrosion Pit", ASME Guide Material Appendix G-7 "Tables for Corrosion Limits", ASME Guide Material Appendix G-8 "Evaluation of MAOP in Corroded Areas". Should repairs be made as a result of atmospheric corrosion documentation of such repairs shall be maintained in the DOT permanent files for the life of the pipeline.

Documentation of the above inspections will be in the Annual Thickness Inspection Reports.

<u>Documentation</u>	<u>Location Filed</u>
RKPG	
<u>P/L Leak & Inspection Reports</u> A-2	<u>DOT Files</u>
RKPG	
<u>Pipeline Patrol/Marker/Leak Inspection</u> E-1	<u>DOT Files</u>

§ 192.481 Atmospheric Corrosion Control: Monitoring

After meeting the requirements of § 192.479 (a) and (b), each operator shall, at intervals not exceeding 3 years for onshore pipeline and least once each calendar year, but with intervals not exceeding 15 months, for offshore pipelines, reevaluate each pipeline that is

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exposed to the atmosphere and take remedial action whenever necessary to maintain protection against atmospheric corrosion.

ESI RESPONSE TO § 192.481

Every three years, pipelines exposed to the atmosphere will be reevaluated and reinspected by the Inspection Department to determine if any remedial action is needed. Documentation of atmospheric corrosion inspections shall be on Pipeline Patrol/Marker/Leak Inspection Reports.

DocumentationLocation Filed

RKPG

Pipeline Patrol/Marker/Leak Inspection E-1DOT Files**§ 192.483 Remedial Measures: General**

- (a) Each segment of metallic pipe that replaces pipe removed from a buried or submerged pipeline because of external corrosion must have a properly prepared surface and must be provided with an external protective coating that meets the requirements of § 192.461.
- (b) Each segment of metallic pipe that replaces pipe removed from a buried or submerged pipeline because of external corrosion must be cathodically protected in accordance with this subpart.
- (c) Except for cast iron or ductile iron pipe, each segment of buried or submerged pipe that is required to be repaired because of external corrosion must be cathodically protected in accordance with this subpart.

DocumentationLocation Filed

RKPG

Post-DOT Construction/Maintenance Records A-2DOT Files

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RKPG

Rectifier ReadingsD-1DOT Files

RKPG

Pipe-to-Soil Potential SurveyD-2DOT Files**ESI RESPONSE TO § 192.483**

After repairing a corrosion leak, magnesium anode(s) shall be installed. Anode(s) are to be installed as far as practical from both the pipe being protected and any foreign lines present. The only exceptions to this mandatory requirement are:

- (a) The pipeline is under cathodic protection,
- (b) A suitably designed cathodic protection system is to be installed,
- (c) The pipeline is scheduled for retirement or replacement within one year.

All replacement steel pipe will be properly coated, prepared, and cathodically protected.

§ 192.485 Remedial Measures: Transmission Lines

- (a) *General corrosion.* Each segment of transmission line with general corrosion and with a remaining wall thickness less than that required for the maximum allowable operating pressure of the pipeline must be replaced or the operating pressure reduced commensurate with the strength of the pipe based on actual remaining wall thickness. However, if the area of general corrosion is small, the corroded pipe may be repaired. Corrosion pitting so closely grouped as to affect the overall strength of the pipe is considered general corrosion for the purpose of this paragraph.

ESI RESPONSE TO § 192.485

Any pipe that is found to be generally corroded so that the remaining wall thickness is less than the minimum thickness required by ESI standard condemning thickness or calculated thickness required for the MAOP of the pipe, will be replaced or repaired and proper coating applied. A remedial action plan will be developed within 90 days.

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- (b) *Localized corrosion pitting.* Each segment of transmission line pipe with localized corrosion pitting to a degree where leakage might result must be replaced or repaired, or the operating pressure must be reduced commensurate with the strength of the pipe, based on the actual remaining wall thickness in the pits.
- (c) Under paragraphs (a) and (b) of this section, the strength of pipe based on actual remaining wall thickness may be determined by the procedure in ASME/ANSI B31G or the procedure in AGA Pipeline Research Committee Project PR3-805(with RSTRENG disk). Both procedures apply to corroded regions that do not penetrate the pipe wall, subject to the limitations prescribed in the procedures.

ESI RESPONSE TO § 192.485

If isolated corrosion pitting is found, ESI Inspection Department will determine the extent of corrosion and forward to the appropriate Unit Manager to initiate repairs or replace the pipe, if necessary.

<u>Documentation</u>		<u>Location Filed</u>
RKPG		
P/L Patrol/Leak/Marker Inspection	E-1	<u>DOT Files</u>
RKPG		
DOT Determination Study for Gas	F-1	<u>DOT Files</u>
RKPG		
Pipeline Data Reference Sheet	F-3	<u>DOT Files</u>

§ 192.487 Remedial Measures: Distribution Lines Other Than Cast Iron or Ductile Iron Lines

- (a) *General corrosion.* Except for cast iron or ductile iron pipe, each segment of generally corroded distribution line pipe with a remaining wall thickness less than that required for the maximum allowable operating pressure of the pipeline, or a remaining wall thickness less than 30% of the nominal wall thickness, must be replaced. However, if the area of general corrosion is small, the corroded pipe may be repaired. Corrosion pitting so closely grouped as to

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affect the overall strength of the pipe is considered general corrosion for the purpose of this paragraph.

- (b) *Localized corrosion pitting.* Except for cast iron or ductile iron pipe, each segment of distribution line pipe with localized corrosion pitting to a degree where leakage might result must be replaced or repaired.

§ 192.489 Remedial Measures: Cast Iron and Ductile Iron Pipelines

- (a) *General graphitization.* Each segment of cast iron or ductile iron pipe on which general graphitization is found to a degree where a fracture or any leakage might result, must be replaced.
- (b) *Localized graphitization.* Each segment of cast iron or ductile iron pipe on which localized graphitization is found to a degree where any leakage might result, must be replaced or repaired, or sealed by internal sealing methods adequate to prevent or arrest any leakage.

§ 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.

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ESI RESPONSE TO § 192.491

Cathodic protection records will be maintained on existing buried pipelines, for the life of the system. Maps and reports of cathodic protection and all records of each test, survey, and inspection will be maintained by the DOT Coordinator.

<u>Documentation</u>	<u>Location Filed</u>
RKPG <u>Plat Maps</u>	<u>A-4</u> <u>DOT Files</u>
RKPG <u>Rectifier Readings</u>	<u>D-1</u> <u>DOT Files</u>
RKPG <u>Pipe-to-Soil Potential Survey</u>	<u>D-2</u> <u>DOT Files</u>
RKPG <u>Casing Status Summary</u>	<u>D-3</u> <u>DOT Files</u>
RKPG <u>Corrosion Coupon Reports</u>	<u>D-4</u> <u>DOT Files</u>
RKPG <u>Interference Bonds</u>	<u>D-5</u> <u>DOT Files</u>
RKPG <u>Rectifier Repair Reports</u>	<u>D-1</u> <u>DOT Files</u>
RKPG <u>Pipeline Patrol/Marker/Leak Inspection</u>	<u>E-1</u> <u>DOT Files</u>