Introduction

The materials contained in this document consist of guidance, techniques, procedures and other information for internal use by the PHMSA pipeline safety enforcement staff. This guidance document describes the practices used by PHMSA pipeline safety investigators and other enforcement personnel in undertaking their compliance, inspection, and enforcement activities and is intended to be used solely as a reference by PHMSA personnel. This document is U.S. Government property and is to be used in conjunction with official duties.

The Federal pipeline safety regulations (49 CFR Parts 190-199) discussed in this guidance document contains legally binding requirements. This document is not a regulation and creates no new legal obligations. In the event of a conflict between this document and any regulation, the document would not be controlling. The materials in this document are explanatory in nature and reflect PHMSA's current application of the regulations in effect at the time of the issuance of the guidance to the implementation scenarios presented in the materials. Alternative approaches are not precluded if they satisfy the requirements of the applicable regulation(s).

Nothing in this guidance document is intended to diminish or otherwise affect the authority of PHMSA to carry out its statutory, regulatory or other official functions or to commit PHMSA to taking any action that is subject to its discretion. Nothing in this document is intended to and does not create any legal or equitable right or benefit, substantive or procedural, enforceable at law by any person or organization against PHMSA, its personnel, State agencies or officers carrying out programs authorized under Federal law.

Decisions about specific investigations and enforcement cases are made according to the specific facts and circumstances at hand. Investigations and compliance determinations often require careful legal and technical analysis of complicated issues. Although this guidance document serves as a reference for the staff responsible for investigations and enforcement, no set of procedures or policies can replace the need for active and ongoing consultation with supervisors and colleagues in enforcement matters.

Comments and suggestions for future changes and additions to this guidance document are invited and should be forwarded to your supervisor.

The materials in this guidance document may be modified or revoked without prior notice by PHMSA management.

Executive Summary

In 2000, the OPS decided to update the Enforcement Manual utilized as a reference document by OPS Engineers for guidance in better understanding and enforcing the regulations included in 49 CFR Parts 192 & 195. This part of the Enforcement Manual was published on 11/17/2005 and covers Part 195, Subpart H - Corrosion Control.

It is OPS intention that the following enforcement guidelines will provide clarification to the code language by providing enforcement criteria, applicable definitions and examples of possible violations for each code section in Part 195, Subpart H. Subpart H contains the minimum requirements for the protection of metallic pipelines from external, internal, and atmospheric corrosion. While a person needs not be an expert in corrosion control area, a basic knowledge of corrosion theory is required to correctly apply to the regulations included in Subpart H. Completion of the Corrosion I and II courses at the Transportation Safety Institute should provide engineers enough knowledge to understand the application of corrosion control techniques to metallic pipeline systems and to be able to identify possible violations of the regulations included in Part 195-Subpart H. A basic understanding of corrosion control phenomena and the regulations will be sufficient for a larger percentage of pipeline carriers, regulated by the OPS. That is, most applications of corrosion control are straight forward and do not vary with physical locations. There are, however, special circumstances in the field of corrosion control that are outside normal situations encountered. OPS engineers must be vigilant and inquisitive concerning application of the minimum requirements for controlling corrosion and whenever conditions exist that are outside those routinely found, consult one of OPS' Senior Engineers for more information. Some types of situations or indications requiring additional expertise such as bacteriological corrosion, transportation fatigues, internal corrosion and cathodic protection in harsh climates.

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Terms & Definitions

Amphoteric Metal:	A metal that is susceptible to corrosion in both acidic and alkaline environments.
Close Interval Survey:	A potential survey with pipe-to-soil readings generally taken a maximum of three (3) feet apart.
Conductivity:	The ability of a substance (measured in ohm-cm) to conduct an electric charge or current due to the presence of positively or negatively charged ions.
Conventional Ground Bed:	A shallow burial ground bed using one or more anodes in one location. The anodes are usually placed in a line perpendicular to the pipeline.
Cathodic Protection:	The change of the electrode potential in the active (negative) direction caused by current across the electrode/electrolyte interface.
Coating:	A liquid, liquefiable, or mastic composition that, after application to a surface, is converted into a solid protective, decorative, or functional adherent film.
Corrosion:	The deterioration of a material, usually a metal, that results from a reaction with its environment.
Corrosion Rate:	The rate at which corrosion proceeds.
Coupon:	A small, carefully weighed and measured specimen of metal that is used to determine metal loss caused by corrosion over a specified period of time.
Criteria:	Standards for assessment of the effectiveness of a cathodic protection system.
Critical Bond:	A bond installed to mitigate interference where the damage would be caused to an operator's facilities if the bond fails.
Current Density:	The current to or from a unit area of an electrode surface.
Deep Ground Bed:	A ground bed in which the anodes are placed far below the earth's surface in a single vertical hole. Deep ground beds are typically considered 50 feet or deeper.
Disbondment:	The loss of adhesion between a coating and the substrate (pipe surface.)
Distributed Ground Bed:	A ground bed where the anodes are spread over a wide geographical area. Usually employed to protect densely routed buried piping systems, such as in compressor station yards.
Electrode:	An electronic conductor used to establish electrical contact with an electrolyte as part of a cathodic protection circuit.
Electrolytically Shorted Casing:	A casing with a low casing to pipe resistance due to the presence of an electrolyte in the casing/pipe annulus. Electrolytically shorted casings are not considered to be metallically shorted.
Erosion:	Abrasive metal loss caused by high surface velocity of the transported media, particularly when entrained solids or particulates are present.
Electrical Isolation:	The condition of being electrically separated from other metallic structures or the environment.
Electrical Resistance:	An electronic probe that can be used in systems where
Probes:	Gas or liquids (including hydrocarbons) are present to determine metal loss over time by measuring the increase in the resistance of the electrode as its cross-sectional area is reduced by corrosion. The resistance of the electrode is then compared with the resistance of a reference electrode.
Electrolyte:	A chemical substance containing ions that migrate in an electric field.
Environment:	The surroundings or conditions (physical, chemical, mechanical) in which a material exists.
Foreign Structure:	Any metallic structure that is not intended as a part of a system under cathodic protection.
Galvanic Corrosion:	Accelerated corrosion of a metal because of an electrical contact with a more noble metal or non-metallic conductor in a corrosive electrolyte.
General Corrosion:	Corrosion that is distributed more or less uniformly over the surface of a material.

Graphitization:	The formation of graphite in iron or steel, usually from decomposition of iron carbide at elevated temperatures.
Holiday:	A discontinuity in a protective coating that exposes unprotected surface to the environment.
Impressed Current:	An electric current supplied by a device employing a power source that is external to the electrode system.
Inhibitors:	An additive used to retard undesirable chemical action in product when added in small quantity.
Instant -Off Potential:	The structure to soil potential immediately after all cathodic protection current is interrupted and prior to polarization decay.
Instant - On Potential:	The structure to soil potential immediately after cathodic protection current is applied and prior to polarization.
Interference:	Ionic current discharged through the electrolytic path from a metallic structure due to the suppression with the cathodic protection system of that structure.
Interference Bond:	A metallic connection designed to control electrical current between metallic systems.
IR Drop:	The voltage drop across a resistance in accordance with Ohm's law.
Ion:	An electrically charged atom or group of atoms.
Oxidation:	(1) Loss of electrons by a constituent of a chemical reaction. (2) Corrosion of a metal that is exposed to an oxidizing gas at elevated temperatures.
pH:	The negative logarithm of the hydrogen ion concentration in a solution. A pH of 7.0 is neutral. A pH lower than 7.0 is acidic, while a pH greater than 7.0 is alkaline.
Pitting:	Localized corrosion of a metal surface that is confined to a small area and takes the form of cavities called pits
Polarization:	The change from the open circuit potential as a result of current across the electrode /electrolyte interface.
Polarized Potential:	The potential across the structure/electrolyte interface that is the sum of the corrosion potential and the cathodic polarization.
Protective Coating:	A coating applied to a surface to protect the substrate from corrosion.
Reference Electrode:	An electrode whose open-circuit potential is constant under similar conditions of measurement, which is used for measuring the relative potentials of other electrodes.
Remote Earth:	A location on the earth far enough from the affected structure that the soil Potential gradients associated with currents entering the earth from the affected structure are insignificant.
Resistance Bond:	A metallic path, where the amount of current is controlled by a permanent or adjustable resistance, installed to provide a return path for cathodic protection current thus to prevent corrosion due to interference or stray current.
Reverse-Current Switch:	A bond designed and constructed such that cathodic protection current can pass in only one direction.
Shielding:	High resistance or non-conducting material preventing cathodic protection current from reaching the structure, or low resistance material diverting the current away from the structure to be protected.
Shorted Pipeline Casing:	A casing that is in direct metallic contact with the carrier pipe.
Stray Current:	Current through paths other than the intended circuit.
Stress Corrosion Cracking:	Cracking of a material produced by the combined action of corrosion and tensile stress (residual or applied).
Ultimate Strength:	The maximum stress that a material can sustain.

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.551**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.551 Scope - What do the regulations in this subpart cover?**		
Existing Code Language:	This subpart prescribes minimum requirements for protecting steel pipelines against corrosion.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Hazardous liquid and carbon dioxide pipelines are almost exclusively made of steel. §195.551 characterizes the activities that are covered by the standards in subpart H (i.e., protecting steel pipelines against external, internal, and atmospheric corrosion). The procedural requirement of this section is covered under §195.402(a) and subsequently 195.402(c)(3).		
Examples of a Violation	**A violation exists if:** 195.551 The operator is transporting a hazardous liquid by a pipeline made of a material other than steel and they do not have written approval from the Administrator. This would be a violation of 195.8, not 195.551.		
Evidence Guidance	Pipe specifications, mill reports, invoices		
Other Special Notations	**Inspector Note:** In the case of a metallic pipeline made from a material other than steel, the operator is required to notify the Administrator a minimum of 90 days prior to transporting the liquid under 195.8. The inspector should discuss this contingency with a senior inspector prior to performing an inspection.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.553**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.553 Definitions - What terms used in this subpart mean?**		
Existing Code Language:	This section provides definitions of terms such as “active corrosion”, “electrical survey” and pipeline environment”, used in subpart H. In addition, it establishes definitions of “buried” and “you.” The definition of “buried” reflects the common corrosion control practice of treating any portion of pipe in contact with the earth as if that portion were buried. The term”you” has the same meaning as “operator.”		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Refer to the attached “Glossary of Terms” for the regulatory definition of terms used in subpart H of part 195. Any questions concerning these definitions should be addressed to a senior inspector or Regional Director.		
Examples of a Violation	None		
Evidence Guidance	None		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.555**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.555 Qualification of Supervisors - What qualifications must supervisors have?**		
Existing Code Language:	This section keeps in effect the existing qualification standards in §195.403(c) for corrosion control supervisors. Under §195.403(c), each operator must require and verify that its supervisors maintain a thorough knowledge of that portion of the corrosion control procedures established under §195.402(c)(3) for which they are responsible for insuring compliance.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator should have records to show that supervisors have received formal and/or technical training commensurate with their responsibilities, e.g. if a supervisor is NACE certified in external corrosion control, this does not necessarily mean they have been adequately trained in internal corrosion control methods. These persons shall have knowledge of the physical sciences and principles of engineering and mathematics, acquired by education and related practical experience, and shall be qualified to engage in the practice of corrosion control on external, internal, and atmospheric corrosion. A qualified person may be a registered professional engineer whose professional activities include suitable experience in corrosion or a person recognized as corrosion specialists or cathodic protection specialists by NACE, or a person with practical experience and training equivalent to NACE's requirements.		
Examples of a Violation	**A violation exists if:** 195.555 The operator cannot provide documentation that supervisors have thorough knowledge and/or experience appropriate with their responsibilities.		
Evidence Guidance	Documentation of training and experience.		
Other Special Notations	**Inspector Note:** Operators may have a hierarchy of personnel responsible for ensuring adequate cathodic protection is applied to that company's pipelines. The supervisor discussed in this regulation concerns the responsible person who is in direct contact with, responsible for and who reviews actual field data for compliance and ultimately will make decisions concerning remedial action. If the operator does not have qualified personnel, they may utilize the services of a competent, qualified contractor or consultant.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.557**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.557(a) External corrosion control: Protective coating Which pipelines must have coating for external corrosion control?**		
Existing Code Language:	This section prescribes standards for external coating on certain buried or submerged pipeline components. Except bottoms of aboveground tanks, each buried or submerged pipeline must have an external coating for external corrosion control if the pipeline is: Constructed, relocated, replaced, or otherwise changed after the applicable date in §195.401(c), not including the movement of pipe covered by §195.424.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The inspector should determine whether the pipelines in question conform to the requirements of 195.401(c) concerning the installation date of the pipeline system.		
Examples of a Violation	**A violation exists if:** 195.557(a) Operator has not coated a pipeline that was constructed, relocated, replaced, or otherwise changed after the applicable dates of installation in 195.401(c).		
Evidence Guidance	Construction/repair records		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.557**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.557 (b) External corrosion control: Protective coating Which pipelines must have coating for external corrosion control?**		
Existing Code Language:	This section prescribes standards for external coating on certain buried or submerged pipeline components. Except bottoms of aboveground tanks, each buried or submerged pipeline must have an external coating for external corrosion control if the pipeline is: Converted under §195.5 and (1) Has an external coating that substantially meets § 195.559 before the pipeline is placed in service; or (2) Is a segment that is relocated, replaced, or substantially altered.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The inspector should look at design documents to ensure that coating is specified, construction documents to ensure coating was applied, and pipe dig/exposure reports to ensure the operator is evaluating the condition of the coating at each opportunity.		
Examples of a Violation	**A violation exists if:** 195.557(b)(1) Operator has not evaluated existing coating of converted pipeline per 195.559. 195.557(b)(2) Operator has not coated a pipeline as applicable for a segment that is relocated, replaced, or substantially altered.		
Evidence Guidance	Construction/repair records		
Other Special Notations	195.5 allows up to 12 months to comply with the sub-part H requirements for converted pipe		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.559**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.559(a) External corrosion control: Cathodic protection system** **What coating material may I use for external corrosion control?**		
Existing Code Language:	Coating material for external corrosion control under §195.557 must: Be designed to mitigate corrosion of the buried or submerged pipeline.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator's program should require a proper evaluation of different types of coating (e.g: organic, inorganic) in terms of their required usage.		
Examples of a Violation	**Violation exists if:** 195.559(a) Proper evaluation of coating was not performed by operator. Coating used by operator does not possess the required properties.		
Evidence Guidance	Coating specifications, O&M Manual		
Other Special Notations	**Inspector Note:** Coating specifications and procedures are usually reviewed during construction inspections or after an incident where failed coating is suspected.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.559**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.559 (b) External corrosion control: Cathodic protection system** **What coating material may I use for external corrosion control?**		
Existing Code Language:	Coating material for external corrosion control under §195.557 must: Have sufficient adhesion to the metal surface to prevent under film migration of moisture.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator's program should require a proper evaluation of different types of coating (e.g: organic, inorganic) in terms of their required usage.		
Examples of a Violation	**Violation exists if:** 195.559(a) Proper evaluation of coating was not performed by operator Coating used by operator does not possess the required properties.		
Evidence Guidance	Coating specifications, O&M Manual		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.559**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.559 (c) External corrosion control: Cathodic protection system** **What coating material may I use for external corrosion control?**		
Existing Code Language:	Coating material for external corrosion control under §195.557 must: Be sufficiently ductile to resist cracking.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator's program should require a proper evaluation of different types of coating (e.g: organic, inorganic) in terms of their required usage.		
Examples of a Violation	**Violation exists if:** 195.559(a) Proper evaluation of coating was not performed by operator Coating used by operator does not possess the required properties.		
Evidence Guidance	Coating specifications, O&M Manual, Review of any incident where disbonded coating was a contributing factor.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.559**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.559 (d) External corrosion control: Cathodic protection system What coating material may I use for external corrosion control?**		
Existing Code Language:	Coating material for external corrosion control under §195.557 must: Have enough strength to resist damage due to handling and soil stress.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator's program should require a proper evaluation of different types of coating (e.g: organic, inorganic) in terms of their required usage.		
Examples of a Violation	**Violation exists if:** 195.559(a) Proper evaluation of coating was not performed by operator Coating used by operator does not possess the required properties.		
Evidence Guidance	Coating specifications, O&M Manual		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date:11/17/2005 Revised: 11/17/2005
Code Reference Number	**195.559**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.559 (e) External corrosion control: Cathodic protection system What coating material may I use for external corrosion control?**		
Existing Code Language:	Coating material for external corrosion control under §195.557 must: Support any supplemental cathodic protection.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator's program should require a proper evaluation of different types of coating (e.g: organic, inorganic) in terms of their required usage.		
Examples of a Violation	**Violation exists if:** 195.559(a) Proper evaluation of coating was not performed by operator Coating used by operator does not possess the required properties.		
Evidence Guidance	Coating specifications, O&M Manual		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.559**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.559 (f) External corrosion control: Cathodic protection system What coating material may I use for external corrosion control?**		
Existing Code Language:	Coating material for external corrosion control under §195.557 must: If the coating is an insulating type, have low moisture absorption and provide high electrical resistance.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator's program should require a proper evaluation of different types of coating (e.g: organic, inorganic) in terms of their required usage.		
Examples of a Violation	**Violation exists if:** 195.559(a) Proper evaluation of coating was not performed by operator Coating used by operator does not possess the required properties.		
Evidence Guidance	Coating specifications, O&M Manual		
Other Special Notations	None.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.561**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.561(a) External corrosion control: Coating inspection** **When must I inspect pipe coating used for external corrosion control?**		
Existing Code Language:	You must inspect all external pipe coating required by § 195.557 just prior to lowering the pipe into the ditch or submerging the pipe.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The Inspector should check for visual and electrical testing (holiday detector/jeep) of the coating. The inspector should inquire about the voltage level used for the test; inspect the "jeep" for the required test setting; proper operation of the "jeep"(i.e. grounded, etc.). Before each use of a jeep, the instrument should be checked to ensure it is operating correctly. Note: For small replacement jobs, jeeping is not normally performed. Close visual examination is sufficient.		
Examples of a Violation	**A violation exists if:** Coating not inspected prior to lowering into ditch.		
Evidence Guidance	O&M Manual, Maintenance records, pictures, Manufacturer's maintenance recommendations		
Other Special Notations	**Inspector Note:** Jeeping is an electrical inspection. The inspector must consider the NACE standard and manufacturer's specifications (coating & instrument) to determine applicable settings for the tool being utilized.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.561**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.561 (b) External corrosion control: Coating inspection When must I inspect pipe coating used for external corrosion control?**		
Existing Code Language:	You must repair any coating damage discovered.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Coating material damaged or improperly installed must be repaired. Inspector should review operator's coating repair procedures to ensure compatibility with applied coating. If the repair is not compatible, this is a violation.		
Examples of a Violation	**A violation exists if:** 195.561(b) A lack of a compatible repair of a holiday is a violation.		
Evidence Guidance	Manufacturer(s)' inspection recommendations, O&M Manual, installation records, pictures.		
Other Special Notations	None.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.563**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.563 (a) External corrosion control: cathodic protection requirements. Which pipeline must have cathodic protection?**		
Existing Code Language:	Each buried or submerged pipeline that is constructed, relocated, replaced, or otherwise changed after the applicable date in §195.401(c) must have cathodic protection. The cathodic protection must be in operation not later than 1 year after the pipeline is constructed, relocated, replaced, or otherwise changed, as applicable.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The inspector should identify when the pipeline in question was installed in accordance with 195.401(c). This will tell you if the pipeline must have an effective external coating as required by 195.557(a). All segments required to have an external coating must have cathodic protection installed and "in operation" within 1 year after the pipeline was constructed, relocated, replaced, or otherwise changed, as applicable.		
Examples of a Violation	**A violation exists if:** The new, replaced, or relocated pipeline segment has an external coating and cathodic protection was not installed and "in operation" within 1 year. 195.563(a)		
Evidence Guidance	None		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.563**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.563 (b) External corrosion control: cathodic protection requirements. Which pipeline must have cathodic protection?**		
Existing Code Language:	Each buried or submerged pipeline converted under §195.5 must have cathodic protection if the pipeline: 1. Has cathodic protection that substantially meets § 195.571 before the pipeline is placed in service; or 2. Is a segment that is relocated, replaced, or substantially altered.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.563(b) If an operator has converted a pipeline to service under 195.5, there are two alternatives for the operator to consider: 1. If the pipeline originally had cathodic protection applied that substantially meets the requirements of 195.571 before the conversion, the operator must maintain the cathodic protection. 2. If the pipeline is a segment that has been relocated, replaced, or substantially altered, it must have cathodic protection applied that meets the requirements of 195.571.		
Examples of a Violation	**A violation exists if:** 195.563(b) For a converted pipeline - operator did not maintain the cathodic protection previously applied. For a pipeline segment that has been relocated, replaced, or substantially altered, cathodic protection has not been applied.		
Evidence Guidance	None.		
Other Special Notations	195.5 allows up to 12 months to comply with the sub-part H requirements for converted pipe		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.563**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.563 (c) External corrosion control: cathodic protection requirements. Which pipeline must have cathodic protection?**		
Existing Code Language:	All other buried or submerged pipelines that have an effective external coating must have cathodic protection. Except as provided by paragraph (d) of this section, this requirement does not apply to breakout tanks and does not apply to buried piping in breakout tank areas and pumping stations until December 29, 2003.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	All pipelines not identified in 563(a) or 563(b) above that are buried or submerged that have an effective external coating, must have cathodic protection. A coating is not considered "effective" if the current required to cathodically protect the pipeline is substantially the same as if the pipe were bare. (For additional information on determining effectiveness of coating, see guidance for §192.457(a)) Section (c) does not apply to breakout tanks or buried piping in breakout tank areas and pumping stations until 2 years after the effective date of the rule unless the operator conducted an electrical survey as previously required by §195.414(c) as to the need for cathodic protection and installed a cathodic protection system as necessary. Section (d) covers this requirement.		
Examples of a Violation	**A violation exists if:** 195.563(c) All pipelines not identified in (a) or (b) above that are buried or submerged that have an effective external coating, that do not have cathodic protection.		
Evidence Guidance	None		
Other Special Notations	None		

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Code Reference Number	**195.563**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.563 (d) External corrosion control: cathodic protection requirements. Which pipeline must have cathodic protection?**		
Existing Code Language:	Bare pipelines, breakout tank areas, and buried pumping station piping must have cathodic protection in places where previous editions of this part required cathodic protection as a result of electrical inspections.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	§195.563(d): In the previous edition of part 195, section 414(c) required operators to electrically inspect breakout tank areas and pump station piping and apply cathodic protection as needed. Also in the previous edition of part 195, section 416(d) required operators to electrically inspect all bare pipelines not cathodically protected at intervals not exceeding 5 years and apply cathodic protection as applicable. Operators would only apply cathodic protection to areas where needed. For pipelines in any of these three areas, the cathodic protection previously applied must be maintained.		
Examples of a Violation	**A violation exists if:** §195.563(d) On bare pipelines or for piping in breakout tank areas or pump stations where the cathodic protection was previously applied and has not been maintained. §195.563(d) Any pipeline, piping in breakout tank areas, or piping in pump stations which does not have cathodic protection installed and in operation.		
Evidence Guidance	None		
Other Special Notations	None		

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Code Reference Number	**195.563**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.563 (e) External corrosion control: cathodic protection requirements. Which pipeline must have cathodic protection?**		
Existing Code Language:	Unprotected pipe must have cathodic protection if required by § 195.573(b).		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	§195.563(e) Operators must perform electrical surveys on their unprotected pipe per the requirements of 195.573(b) and apply cathodic protection as required.		
Examples of a Violation	**A violation exists if:** §195.563(e) Operators have not performed electrical surveys on their unprotected pipe per the requirements of 195.573(b) or applied cathodic protection as required.		
Evidence Guidance	None		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.565**	**Corrosion Control Procedure Rewrite committee**	
Heading	**195.565 Cathodic Protection on breakout tanks: How do I install cathodic protection on breakout tanks?**		
Existing Code Language:	After October 2, 2000, when you (operator) install cathodic protection under §195.563(a) to protect the bottom of an aboveground breakout tank of more than 500 barrels capacity built to API Specification 12F, API Standard 620, or API Standard 650 (or its predecessor Standard 12C), you must install the system in accordance with API Recommended Practice 651. However, installation of the system need not comply with API Recommended Practice 651 on any tank for which you note in the corrosion control procedures established under §195.402(c)(3) why compliance with all or certain provisions of API Recommended Practice 651 is not necessary for the safety of the tank.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	The operator must develop procedures for corrosion control in accordance with §195.402(c)(3). Whenever the operator installs cathodic protection on an aboveground breakout tank, the installation must be in accordance with API Recommended Practice 651 unless the operator documents and justifies why compliance with all or certain provisions of the standard are not necessary.		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Under 195.402(c)(3), operators are required to identify those breakout tanks which require CP and to install CP in accordance with API 651. As an alternative, operators' procedures should document and justify why they are not required to comply with all or certain provisions of API Recommended Practice 651.		
Examples of a Violation	The operator has not installed cathodic protection on required tanks in accordance with API Recommended Practice 651 within the specified time period and has not justified why all or certain provisions of the Recommended Practice are not necessary for the safety of the tank.		
Evidence Guidance	O&M Manual, API Recommended Practice 651, API Standard 653		
Other Special Notations	None		

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Code Reference Number	**195.567**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.567(a): Test Leads - Which pipelines must have test leads and what must I do to install and maintain the leads?**		
Existing Code Language:	General: Except for offshore pipelines, each buried or submerged pipeline or segment of pipeline under cathodic protection required by this subpart must have electrical test leads for external corrosion control. However, this requirement does not apply until December 27,2004 to pipelines or pipeline segments on which test leads were not required by regulations in effect before January 28, 2002.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	<u>Some factors to consider:</u> Pipe coating-(Coating Quality Surveys, e.g. C- Scan) Age of pipe - (pipe coating may deteriorate with age) Increasing current requirements over time * increasing current output from rectifiers over time River crossings - current measuring test stations on either side of the crossing. A comparison of the magnitude of current pick up from each side of the river will allow one to calculate current pick up in the river. A review should be made of the operator's standards for making test lead connections to ensure proper application and continuity. **Inspector Note:** The inspector must be cognizant of test station readings. If the line is cathodically protected and the reading is <0.5 mV, you may have a problem with the test lead, e.g. a short. Additional investigation is needed to determine whether the operator is reading the unattached copper lead to ground or if the lead is shorted. 1 INSTALLATION METHODS Some acceptable methods include the following. 1.1 Thermit welding. (a) Steel. Attachment of electrical leads directly to steel pipe by the thermit welding process using copper oxide and aluminum powder. The thermit welding charge should be limited to a 15-gram cartridge. 1.2 Solder connections. Attachment of electrical leads directly to steel pipe with the use of soft solders or other materials which do not involve temperatures exceeding those for soft solders.		

	1.3 Mechanical connections. Mechanical connections should remain secure and electrically conductive. 2 OTHER CONSIDERATIONS For convenience, conductors may be coded or permanently identified. Wire should be installed with slack. Damage to insulation should be avoided. Repairs should be made if damage occurs. Test leads should not be exposed to excessive heat or excessive sunlight.
Examples of a Violation	**A violation exists if:** • 195.567(a) The P/S measurements at or between two adjacent test stations does not meet the operator's criteria for cathodic protection or the operator has had a corrosion leak or if between two subsequent smart pig surveys, new corrosion is discovered. If new corrosion is occurring on a line, the operator does not have adequate cathodic protection and by default may not have an adequate number of test stations to effectively evaluate the system or an isolated shielding problem. • The test lead is not connected to the pipe. • The test lead is not mechanically secure. • The test lead is not electrically conductive. • The operator has not repaired or replaced required test leads when found. • The thermit welding charge is greater than a 15-gram cartridge. • The connection is not coated.
Evidence Guidance	None
Other Special Notations	**Inspector Note:** The operator should indicate the test points used to show adequacy of cathodic protection. Measurements should be taken at these test stations while conducting the annual survey. Operators may install additional wires on their pipe to perform special tests on the cathodic protection system. Potentials at these locations are not required during annual CP surveys.

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Code Reference Number	**195.567**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.567 (b): Test Leads - Which pipelines must have test leads and what must I do to install and maintain the leads?**		
Existing Code Language:	Installation: You must install test leads as follows: 1. Locate the leads at intervals frequent enough to obtain electrical measurements indicating the adequacy of cathodic protection. 2. Provide enough looping or slack so backfilling will not unduly stress or break the lead and the lead will otherwise remain mechanically secure and electrically conductive. 3. Prevent lead attachments from causing stress concentrations on pipe. 4. For leads installed in conduits, suitably insulate the lead from the conduit. 5. At the connection to the pipeline, coat each bared test lead wire and bared metallic area with an electrical insulating material compatible with the pipe coating and the insulation on the wire.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.567(a) The operator must have sufficient test stations where data is collected to demonstrate that their entire pipeline is cathodically protected. Common industry practice is to install test stations at convenient locations along the ROW. Has the operator performed a close-interval-survey (CIS) on the pipeline? Close interval surveys not only confirm P/S readings at the established test stations but also give cathodic protection's effectiveness between the two test stations. After performing a CIS, the operator may have found areas of low P/S potentials between the test stations which indicate a need to take remedial action. This may include adding additional galvanic anodes, new rectifier and ground bed, and increasing the output of the rectifiers on either side of the area of low readings. If the inspector expects that there are insufficient test stations, he may require the operator to reel out wire from the existing test stations to check potentials in between. Also, leak history should be reviewed and if corrosion leak occurs, the number of test stations may be insufficient to ensure the adequacy of cathodic protection. <u>Some factors to consider:</u> Pipe coating-(Coating Quality Surveys, e.g. C- Scan) Age of pipe - (pipe coating may deteriorate with age) Increasing current requirements over time * increasing current output from rectifiers over time River crossings - current measuring test stations on either side of the crossing. A comparison of the magnitude of current pick up from each side of the river will allow one to calculate current pick up in the river.		

	A review should be made of the operator's standards for making test lead connections to ensure proper application and continuity. **Inspector Note:** The inspector must be cognizant of test station readings. If the line is cathodically protected and the reading is <0.5 mV, you may have a problem with the test lead, e.g. a short. Additional investigation is needed to determine whether the operator is reading the unattached copper lead to ground or if the lead is shorted. 1 INSTALLATION METHODS Some acceptable methods include the following. 1.1 Thermit welding. (a) Steel. Attachment of electrical leads directly to steel pipe by the thermit welding process using copper oxide and aluminum powder. The thermit welding charge should be limited to a 15-gram cartridge. 1.2 Solder connections. Attachment of electrical leads directly to steel pipe with the use of soft solders or other materials which do not involve temperatures exceeding those for soft solders. 1.3 Mechanical connections. Mechanical connections should remain secure and electrically conductive. 2 OTHER CONSIDERATIONS For convenience, conductors may be coded or permanently identified. Wire should be installed with slack. Damage to insulation should be avoided. Repairs should be made if damage occurs. Test leads should not be exposed to excessive heat or excessive sunlight.
Examples of a Violation	**A violation exists if:** • 195.567(b): Cannot locate the test leads to obtain electrical measurements. • If the test leads are not mechanically secure and electrically conductive. • The test lead installation does not prevent lead attachments from causing stress concentrations on pipe. • If installed in the conduits, the lead is not insulated from the conduit. • The bared test lead is not coated at the connection to the pipeline.
Evidence Guidance	None
Other Special Notations	None.

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Code Reference Number	**195.567**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.567 (c): Test Leads - Which pipelines must have test leads and what must I do to install and maintain the leads?**		
Existing Code Language:	Maintenance: You must maintain the test lead wires in a condition that enables you to obtain electrical measurements to determine whether cathodic protection complies with §195.571.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	When the operator discovers that a required test lead is damaged or defective to the point that the ability to perform electrical measurements is impaired, the operator must take action to repair or replace the test lead. Remediation must be completed prior to the next monitoring cycle.		
Examples of a Violation	The operator did not maintain the test lead wires so that electrical measurements could not be obtained to determine whether cathodic protection is adequate.		
Evidence Guidance	None		
Other Special Notations	None.		

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Code Reference Number	**195.569**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.569: Remedial actions - Exposed pipe** **Do I have to examine exposed portions of buried pipelines?**		
Existing Code Language:	Whenever you have knowledge that any portion of a buried pipeline is exposed, you must examine the exposed portion for evidence of external corrosion, if the pipe is bare or if the coating is deteriorated. If you find external corrosion requiring corrective action under § 195.585, you must investigate circumferentially and longitudinally beyond the exposed portion (by visual examination, indirect method, or both) to determine whether additional corrosion requiring remedial action exists in the vicinity of the exposed portion.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		

Guidance Material	The Inspector should check for this procedure in the operator's O&M manual. Determine if they have a reporting requirement listed. Ask to see these reports and any subsequent maintenance orders generated by these reports. Leak reports may contain this information also. If the operator does not have this procedure spelled out in their manual; ask how they comply and what evidence they have to confirm that it is carried out. This may be a violation. The purpose of the regulation is to prevent accidents due to the existence of harmful corrosion near the area of pipe exposure. This regulation was intentionally designed to permit varying approaches to compliance because of the different conditions that are encountered at excavation sites. Assuming each operator's approach is sufficient to determine the extent of harmful corrosion found at an excavation, the regulation should be effective overall. There is an issue of how far to carry an investigation of harmful corrosion found at an excavation. The operator should be concerned that harmful corrosion located near the exposed portion of pipe would go undetected if operators investigated only for corrosion that adjoins corrosion observed on the exposed portion. However, recognizing the complexity of specifying the scope of investigation, the regulation allows operators to use their own judgment on where to stop investigating for corrosion. The inspector should be sensitive to the position that the proposed rule could be interpreted to set in motion a seemingly endless search for harmful corrosion on some pipelines. In conclusion, a reasonable effort should be required to find corrosion in the vicinity of an exposed, corroded pipe. If deteriorated coating or external corrosion is found, the operator shall continue to investigate further until corroded or other damaged areas requiring remedial action are no longer encountered.
Examples of a Violation	**A Violation exists if:** Exposed pipe is not examined for evidence of external corrosion, i.e. No documentation.
Evidence Guidance	**Evidence:** Exposed pipe is not examined for evidence of external corrosion, i.e. no documentation.
Other Special Notations	**Inspector Note:** Inspector should correlate one-call tickets with exposed pipe reports and check alignment sheets for updates of foreign line crossings.

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.571**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.571: Cathodic protection criteria** **What criteria must I use to determine the adequacy of cathodic protection?**		
Existing Code Language:	Cathodic protection required by this subpart must comply with one or more of the applicable criteria and other considerations for cathodic protection contained in paragraphs 6.2 and 6.3 of NACE Standard RPO169-96.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Section 6: Criteria and Other Considerations for Cathodic Protection See Also: Bibliography for Section 6 6.1 Introduction 6.1.1 This section lists criteria and other considerations for cathodic protection that will indicate, when used either separately or in combination, whether adequate cathodic protection of a metallic piping system has been achieved (see also Section 1, Paragraphs 1.2 and 1.4). 6.1.2 The effectiveness of cathodic protection or other external corrosion control measures can be confirmed by visual observation, by measurements of pipe wall thickness, or by use of internal inspection devices. Because such methods sometimes are not practical, meeting any criterion or combination of criteria in this section is evidence that adequate cathodic protection has been achieved. When excavations are made for any purpose, the pipe should be inspected for evidence of corrosion and/or coating condition. 6.1.3 The criteria in this section have been developed through laboratory experiments and/or verified by evaluating data obtained from successfully operated cathodic protection systems. Situations may exist where a single criterion for evaluating the effectiveness of cathodic protection may not be satisfactory for all conditions. Often a combination of criteria is needed for a single structure. 6.1.4 Sound engineering practices shall be used to determine the methods and frequency of testing required to satisfy these criteria. 6.1.5 Corrosion leak history is valuable in assessing the effectiveness of cathodic protection. Corrosion leak history by itself, however, shall not be used to determine whether adequate levels of cathodic protection have been achieved unless it is impractical to make electrical surveys. 6.2 Criteria		

6.2.1 It is not intended that persons responsible for external corrosion control be limited to the criteria listed below. Criteria that have been successfully applied on existing piping systems can continue to be used on those piping systems. Any other criteria used must achieve corrosion control comparable to that attained with the criteria herein.

6.2.2 Steel and Cast Iron Piping

6.2.2.1 External corrosion control can be achieved at various levels of cathodic polarization depending on the environmental conditions. However, in the absence of specific data that demonstrate that adequate cathodic protection has been achieved, one or more of the following shall apply:

6.2.2.1.1 A negative (cathodic) potential of at least 850 mV with the cathodic protection applied. This potential is measured with respect to a saturated copper/copper sulfate reference electrode contacting the electrolyte. Voltage drops other than those across the structure-to-electrolyte boundary must be considered for valid interpretation of this voltage measurement.

NOTE: Consideration is understood to mean the application of sound engineering practice in determining the significance of voltage drops by methods such as:

6.2.2.1.1.1 Measuring or calculating the voltage drop(s);
6.2.2.1.1.2 Reviewing the historical performance of the cathodic protection system;
6.2.2.1.1.3 Evaluating the physical and electrical characteristics of the pipe and its environment; and
6.2.2.1.1.4 Determining whether or not there is physical evidence of corrosion.
6.2.2.1.2 A negative polarized potential (see definition in Section 2) of at least 850 mV relative to a saturated copper/copper sulfate reference electrode.
6.2.2.1.3 A minimum of 100 mV of cathodic polarization between the structure surface and a stable reference electrode contacting the electrolyte. The formation or decay of polarization can be measured to satisfy this criterion.

6.2.2.2 Special Conditions

6.2.2.2.1 On bare or ineffectively coated pipelines where long-line corrosion activity is of primary concern, the measurement of a net protective current at predetermined current discharge points from the electrolyte to the pipe surface, as measured by an earth current technique, may be sufficient.
6.2.2.2.2 In some situations, such as the presence of sulfides, bacteria, elevated temperatures, acid environments, and dissimilar metals, the criteria in Paragraph 6.2.2.1 may not be sufficient.
6.2.2.2.3 When a pipeline is encased in concrete or buried in dry or aerated high-resistivity soil, values less negative than the criteria listed in Paragraph 6.2.2.1 may be sufficient.

6.2.2.3 PRECAUTIONARY NOTES

6.2.2.3.1 The earth current technique is often meaningless in multiple pipe rights-of-

	way, in high-resistivity surface soil, for deeply buried pipe, in stray-current areas, or where local corrosion cell action predominates. 6.2.2.3.2 Caution is advised against using polarized potentials less negative than -850 mV for cathodic protection of pipelines when operating pressures and conditions are conducive to stress corrosion cracking (see references on stress corrosion cracking in the Bibliography for Section 6). 6.2.2.3.3 The use of excessive polarized potentials on externally coated pipelines should be avoided to minimize cathodic disbondment of the coating. 6.2.2.3.4 Polarized potentials that result in excessive generation of hydrogen should be avoided on all metals, particularly higher strength steel, certain grades of stainless steel, titanium, aluminum alloys, and prestressed concrete pipe. 6.2.3 Aluminum Piping 6.2.3.1 The following criterion shall apply: a minimum of 100 mV of cathodic polarization between the structure surface and a stable reference electrode contacting the electrolyte. The formation or decay of this polarization can be used in this criterion. 6.2.3.2 PRECAUTIONARY NOTES 6.2.3.2.1 Excessive Voltages: Notwithstanding the minimum criterion in Section 6.2.3.1, if aluminum is cathodically protected at voltages more negative than -1200 mV measured between the pipe surface and a saturated copper/copper sulfate reference electrode contacting the electrolyte and compensation is made for the voltage drops other than those across the pipe-electrolyte boundary, it may suffer corrosion as the result of the buildup of alkali on the metal surface. A polarized potential more negative than -1,200 mV should not be used unless previous test results indicate that no appreciable corrosion will occur in the particular environment. 6.2.3.2.2 Alkaline Conditions: Aluminum may suffer from corrosion under high-pH conditions and application of cathodic protection tends to increase the pH at the metal surface. Therefore, careful investigation or testing should be made before applying cathodic protection to stop pitting attack on aluminum in environments with a natural pH in excess of 8.0. 6.2.4 Copper Piping 6.2.4.1 The following criterion shall apply: a minimum of 100 mV of cathodic polarization between the structure surface and a stable reference electrode contacting the electrolyte. The formation or decay of this polarization can be used in this criterion. 6.2.5 Dissimilar Metal Piping 6.2.5.1 A negative voltage between all pipe surfaces and a stable reference electrode contacting the electrolyte equal to that required for the protection of the most anodic metal should be maintained. 6.2.5.2 PRECAUTIONARY NOTE 6.2.5.2.1 Amphoteric materials that could be damaged by high alkalinity created by

	cathodic protection should be electrically isolated and separately protected. 6.3 Other Considerations 6.3.1 Methods for determining voltage drop(s) shall be selected and applied using sound engineering practices. Once determined, the voltage drop(s) may be used for correcting future measurements at the same location, providing conditions such as pipe and cathodic protection system operating conditions, soil characteristics, and external coating quality remain similar. (Note: Placing the reference electrode next to the pipe surface may not be at the pipe-electrolyte interface. A reference electrode placed at an externally coated pipe surface may not significantly reduce soil voltage drop in the measurement if the nearest coating holiday is remote from the reference electrode location.) 6.3.2 When it is impractical or considered unnecessary to disconnect all current sources to correct for voltage drop(s) in the structure-to-electrolyte potential measurements, sound engineering practices should be used to ensure that adequate cathodic protection has been achieved. 6.3.3 Where feasible and practicable, in-line inspection of pipelines may be helpful in determining the presence or absence of pitting corrosion damage. Absence of external corrosion damage or the halting of its growth may indicate adequate external corrosion control. The in-line inspection technique, however, may not be capable of detecting all types of external corrosion damage, has limitations in its accuracy, and may report as anomalies items that are not external corrosion. For example, longitudinal seam corrosion and general corrosion may not be readily detected by in-line inspection. Also, possible thickness variations, dents, gouges, and external ferrous objects may be detected as corrosion. The appropriate use of in-line inspection must be carefully considered. 6.3.4 Situations involving stray currents and stray electrical gradients may exist that require special analysis. For additional information, see Section 9 , "Control of Interference Currents."
Examples of a Violation	Operator does not meet one of the criteria listed in NACE RP-0169-96.
Evidence Guidance	Records of annual Cathodic protection readings, O&M Manual, operator personnel statements, maintenance records, operator’s procedural requirements.
Other Special Notations	None

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Code Reference Number	**195.573**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.573 (a): Cathodic protection monitoring** **What must I do to monitor external corrosion control?**		
Existing Code Language:	Protected pipelines: You must determine whether cathodic protection required by this subpart complies with § 195.571: (1) Conduct tests on the protected pipeline at least once each calendar year, but with intervals not exceeding 15 months. However, if tests at those intervals are impractical for separately protected short sections of bare or ineffectively coated pipelines, testing may be done at least once every 3 calendar years, but with intervals not exceeding 39 months. (2)Identify before December 29, 2003 or not more than 2 years after cathodic protection is installed, whichever comes later, the circumstances in which a close interval survey or comparable technology is practicable and necessary to accomplish the objectives of paragraph 10.1.1.3 of NACE Standard RPO169-96(incorporated by reference, see §195.3).		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Existing Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.573(a)(1) This requirement is usually referred to as the “annual CP survey”. The inspector needs to be able to identify a few different requirements in order to determine if a pipeline is adequately protected in its entirety, such as: The inspector needs to determine if the operator has a sufficient number of test points read annually to show the adequacy of the CP system. The inspector needs to know which criteria the operator is using to show adequate CP. The inspector should review past ~~year's~~ annual surveys to find out if an on/off survey has ever been performed on this system or any other means the operator is using to account for I/R drop. The inspector should review past annual CP surveys to identify areas of questionable or low CP readings. A cathodically protected pipeline is not inspected at least once each calendar year or at intervals less than 15 months to determine whether one or more requirements of §195.571 are met.		

	Inspector Note: Operators who are electrically monitoring their entire bare (ineffectively coated) sections of pipeline on a 5-year basis would not have to include their hot spot protected sections of pipe in their annual CP survey. **Evidence of violation - § 195.573(a)(1):** Documentation showing pipeline is cathodically protected and not tested within required interval and/or documentation showing that P/S potentials do not meet a criteria contained in section 6.2 or 6.3 of NACE RP-0169-96. 195.573(a)(2) - Section 10.1.1.3 states, "Where practicable and determined necessary by sound engineering practice, a detailed (close-interval) potential survey should be conducted to (a) assess the effectiveness of the cathodic protection system; (b) provide base line operating data; (c) locate areas of inadequate protection levels; (d) identify locations likely to be adversely affected by construction, stray currents, or other unusual environmental conditions; or (e) select areas to be monitored periodically." The inspector should discuss this with the operator to determine if the objectives of the NACE recommendations have been met within the 2 year time frame. The operator should have records to show compliance with this section. Also, the operator has to rely on its CIS procedural requirement in terms of frequency and spacing.
Examples of a Violation	None
Evidence Guidance	None
Other Special Notations	None

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Code Reference Number	**195.573**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.573 (b): Cathodic protection monitoring** **What must I do to monitor external corrosion control?**		
Existing Code Language:	Unprotected pipe: You must reevaluate your unprotected buried or submerged pipe and cathodically protect the pipe in areas in which active corrosion is found, as follows: (1)Determine the areas of active corrosion by electrical survey, or where an electrical survey is impractical, by other means that include review and analysis of leak repair and inspection records, corrosion monitoring records, exposed pipe inspection records, and the pipeline environment. (2) For the period in the first column, the second column prescribe the frequency of evaluation. Period: — Evaluation Frequency Before December 29, 2003: — At least every 5 calendar years, but with intervals not exceeding 63 months Beginning December 29, 2003: — At least once every 3 calendar years, but with intervals not exceeding 39 months		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Existing Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.573(b) This section requires the operator to conduct an electrical survey or, if the operator declares an electrical survey to be impractical, review other applicable records to determine areas of “active corrosion.” The operator must demonstrate why it is "impractical." The operator need not prove physical impossibility. If such areas are discovered, the operator must cathodically protect them in accordance with subpart H. One method to identify areas of “active corrosion” on a bare or poorly coated pipeline is to perform a 2 half cell survey (also called a “side-drain survey”). The inspector is cautioned that this survey may not work in multiple pipeline ROW’s. This electrical survey will identify current discharge points which indicate anodic areas where corrosion is occurring. Galvanic anodes are installed at these points on the pipeline and tests should be made to ensure that the problem has been remediated. This is known as “net protective current” as discussed in the NACE Standard RP0169-96 under “Special Conditions, section 6.2.2.2.1. The inspector is cautioned that this survey may not work in all areas. Refer to “Precautionary Notes” section 6.2.2.3.1 in NACE Standard RP-0169-96.		

	Operators who do not run electrical surveys over their unprotected metallic pipelines must have developed a separate program (documented) to effectively monitor unprotected coated and bare (ineffectively coated) pipelines. The operators must demonstrate that they are effectively using their review and analysis of leak repair and inspection records, corrosion monitoring records, exposed pipe inspection records and the pipeline environment. Based on the results of this monitoring, operators must take action to cathodically protect areas of active corrosion on their system. **Inspector Note:** If an operator completes their 5 year survey in May of 2000. The next survey must be completed by August of 2005. **Inspector Note:** Unless an operator is attempting to cathodically protect a bare pipeline in its entirety, the operator is not required to monitor anodes installed to mitigate an area of active corrosion as defined in the regulation on an annual basis.
Examples of a Violation	A non-cathodically protected pipeline initially evaluated pursuant to § 195.573, is not reevaluated at least every 5 years not to exceed 63 months.
Evidence Guidance	None
Other Special Notations	None

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.573**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.573 (c): Cathodic protection monitoring** **What must I do to monitor external corrosion control?**		
Existing Code Language:	Rectifier and other devices: You must electrically check for proper performance each of the following devices at the intervals indicated: Rectifier: Six times each calendar year, but with intervals not exceeding 2½ months. Reverse current switch: Same as above Diode: Same as above Interference bond whose failure would jeopardize structural protection: Same as above Other interference bond: At least once each calendar year, but with intervals not		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Existing Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.573(c) Inspector should review each of the required records to ensure appropriate time frames were met. **For rectifiers:** Current output should be sufficient to protect the pipeline and should be kept at appropriate levels. The inspector should compare each bi-monthly inspection to identify areas where problems may exist. **Inspector Note**: There is the possibility that the rectifier case is shorted to the AC side of the rectifier and the possibility of becoming the ground for the system and receiving a severe (fatal) shock is prevalent. If you must be the first person to touch a rectifier box, do so with the back of your hand. Other impressed current power sources include propane or natural gas driven thermocouples, photovoltaic power sources must include sufficient battery power to maintain adequate CP overnight. **Ensure operation:** Acceptable remote monitoring devices (lights, whirlybirds, spinners) must be driven by the DC side of the rectifier and must be designed to shut off if the required level of protection for that segment of line falls below the criteria for required current output. If the operator has procedures that require more frequent monitoring than required by the code, e.g. monthly rectifier inspections, the inspector must endeavor to ascertain whether the increased frequency is due to a safety concern. If the added frequency		

	is due to a safety concern or integrity issue, then the OPS inspector should look for the number of inspections required in the operator's manual. OPS policy is to require the operator to follow their O&M plan. For Reverse Current Switch, Diode, Interference Bonds: The inspector must review records for compliance with appropriate time frames. There are 2 types of interference bonds the operator must consider. The first type is one that if broken, the operator's pipeline is not in jeopardy which is known as a "non-critical" bond. This bond must be monitored once per year not to exceed 15 months. The second type is one that if broken, the operator's pipeline is in jeopardy which is known as a "critical" bond. This bond must be monitored 6 times per year not to exceed 2 ½ months. Each other interference bond must be checked at least once each calendar year, but with intervals not exceeding 15 months. Bonds across insulators utilized by an operator to facilitate CP (continuity bonds) are not required to be tested as interference bonds.
Examples of a Violation	The rectifiers, reverse current switches, diodes and interference bonds (critical bonds) whose failure would jeopardize structural protection, are not inspected six times each calendar year and with intervals not exceeding 2 1/2 months. The operator did not inspect its interference bonds at least once each calendar year but with intervals not exceeding 15 months.
Evidence Guidance	Operator's O & M procedure, maintenance records.
Other Special Notations	None

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.573**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.573 (d): Cathodic protection monitoring** **What must I do to monitor external corrosion control?**		
Existing Code Language:	Breakout tanks: You must inspect each cathodic protection system used to control corrosion on the bottom of an aboveground breakout tank to ensure that operation and maintenance of the system are in accordance with API Recommended Practice 651. However, this inspection is not required if you note in the corrosion control procedures established under § 195.402(c)(3) why compliance with all or certain operation and maintenance provisions of API Recommended Practice 651 is not necessary for the safety of the tank.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Existing Enforcement Language	The inspector should review operator's procedures and records for cathodic protection of aboveground breakout tanks. API Recommended Practice 651 is commonly utilized by industry and the inspector should be familiar with its requirements. The operator must develop procedures for corrosion control in accordance with §195.402(c)(3). Whenever the operator inspects its cathodic protection systems on an aboveground breakout tank, the inspection must be in accordance with API Recommended Practice 651 unless the operator documents and justifies why compliance with all or certain operation and maintenance provisions of the standard are not necessary.		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Whenever the operator inspects its cathodic protection systems on an aboveground breakout tank, the inspection must be in accordance with API Recommended Practice 651 unless the operator documents and justifies why compliance with all or certain operation and maintenance provisions of the standard are not necessary.		
Examples of a Violation	The cathodic protection system of breakout tank's bottom is not inspected to ensure that operation and maintenance of the system are in accordance with API Recommended Practice 651 except if the operator's corrosion control procedure list the reasons why they do not comply with all or part of API 651		
Evidence Guidance	Operator's O & M procedure, maintenance records, API Recommended Practice 651		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.573**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.573 (e): Cathodic protection monitoring** **What must I do to monitor external corrosion control?**		
Existing Code Language:	Corrective action: You must correct any deficiency in corrosion control identified by monitoring as soon as required by §195.401(b). However, if the deficiency involves a pipeline in an integrity management program under §195.452, you must correct the deficiency as required by §195.452(h).		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Existing Enforcement Language	A violation of § 192.465(d) exists if: Prompt remedial action is not taken to correct a deficiency indicated by monitoring. Inspection guidelines for §192.465 (d) The definition of "prompt" will vary with the circumstances. Enforcement should be sought only when the investigator is convinced that corrective action was unreasonably delayed. Inspector must state why he determined the delay to be unreasonable. The operator should be required to have procedures (per 192.453) for responding to deficiencies found by the required monitoring. Those procedures should include as a minimum: 1. A time frame for evaluating data and determining a course of action. 2. A time frame for any new installation to be operational and Cathodic Protection to be in the adequate range. These time frames should give consideration to the population density and environmental concerns of the area that could potentially be affected by released gas. They may also consider climatic conditions, availability of material, work loads, and an estimate of a relative rate of detrimental corrosion. As a rule of thumb, the OPS would expect that, under normal conditions, the operator should have the evaluations and decisions made and action started within a few months, proportionally less where required monitoring is less than a year or where deficiencies could result in an immediate hazard to the public), and correction completed by the time of the next scheduled monitoring. If the operator has no procedure for promptly responding and deficiencies exist, it is a violation of 192.465(d). If you can demonstrate that the operator's established time frame for action is inadequate, you may cite him for a violation or proceed with a notice of amendment or both. Evidence of violation - § 192.465 (d): 1. a. Documentation showing that deficiency was discovered, including operator's records of monitoring performed and the operator's written procedures per § 192.605; and 2. b. Documentation showing that corrective action has not been taken; including:		

	i. Statement of absence of action by operator or investigator; or ii. Documentation showing that corrective action was not taken promptly, including operator's record of date of discovery and date of corrective action.
Pending NPRM	None
Interpretation 1 Excerpts	None
Other Ref. Material & Source	NACE RP-0169-96
Guidance Material	The inspector should review operator’s procedure on how the prompt remedial action is defined and then review its maintenance records to assure proper compliance.
Examples of a Violation	The operator did not take prompt remedial action in correcting the defiiencies as indicated by the corrosion control monitoring.
Evidence Guidance	Operator’s corrosion control procedure, maintenance records. Pipe-to-soil readings of last two consecutive years, remedial action records.
Other Special Notations	None

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.575**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.575 (a): Electrical isolation** **Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**		
Existing Code Language:	You must electrically isolate each buried or submerged pipeline from other metallic structures, unless you electrically interconnect and cathodically protect the pipeline and the other structures as a single unit.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	To facilitate current distribution, pipelines may be divided into segments or isolated from pump station piping by isolating devices. Unintentional shorts to other metallic structures may drop the P/S potentials below the required CP criteria. These shorts should be cleared. Electrical isolation may be accomplished by using: Insulating flange kits, unions, insulating joints, polarization cells, or grounding cells. An operator does not necessarily need to take P/S potentials on non-jurisdictional metallic structures (water, electrical, or grounding systems) that are part of the cathodically protected system. As long as the operator's annual survey on their pipeline meets applicable CP criterion, they are in compliance with 195.573(a)(1). Usually, it is a good practice to take pipe-to-soil readings on both sides of an insulator. **Casing Policy**: Casings are electrically isolated from carrier pipeline because usually they are uncoated and will rob the current away from the carrier pipeline. To avoid this loss of current form the carrier pipeline, casings are electrically isolated from the pipeline. However sometime this isolation cannot be maintained. This failure may be classified as either direct or electrolytic shorts. Direct shorts occur when the carrier pipe and the casing are in metallic contact. The electrical resistance between the carrier pipe and the casing would be zero ohms. If it is not practical to clear the short, the operator must consider introducing a high dielectric into the annulus. If the operator considers introducing a high dielectric impractical, the operator must physically monitor a shorted casing with a leak detection instrument or internal monitoring on a periodic basis. Electrolytic shorts occur when the casing is filled with an electrolyte. This type of short may or may not be low resistance. The rule of thumb is that the carrier pipe is protected when there is an electrolytic short and, therefore, corrosion engineers do not see this short as an operational concern. This is because when a casing has an		

	electrolyte in the annulus, the protective current will discharge from the casing to pipe which protects the carrier pipe. A violation exists if there is a metallic or direct short between the carrier pipe and the casing. The operator is required to clear the short or take other measures to minimize corrosion of the pipeline inside the casing. After the cathodic protection survey has been completed and a shorted casing has been identified, the operator should determine a course of action 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 or an equivalent option developed by the operator: (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 impractical, 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 over-pressure, and environmental factors, the operator may choose to monitor the casing with leak detection instruments at intervals not exceeding the requirements of this subpart. 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. In lieu of the above options, an operator may use an internal inspection device (pigging) to periodically monitor a shorted casing. If corrosion is detected on the carrier pipe inside the casing, the operator must have a written procedure to evaluate the extent and severity of the corrosion and a means for correction. The written procedure must contain a frequency for reevaluation.
Examples of a Violation	**A violation exists if:** 195.575(a) Operator did not demonstrate through inspection & electrical tests, that electrical isolation is adequate. The operator does not have records to show that testing has been performed and that the isolation is effective.
Evidence Guidance	CP records, written procedures(or lack there of), inspector observation, pictures
Other Special Notations	None

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.575**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.575 (b): Electrical isolation** **Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**		
Existing Code Language:	You must install one or more insulating devices where electrical isolation of a portion of a pipeline is necessary to facilitate the application of corrosion control.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	To facilitate the application of corrosion control, the operator must install one or more insulating devices in a segment of pipeline where electrical isolation is necessary. Electrical isolation may be achieved by using insulating flange kits or any other suitable devices. The pipe-to-soil readings should be taken on both sides of an insulator during annual cathodic protection monitoring or when it is deemed necessary.		
Examples of a Violation	**A violation exists if:** The operator does not have records to show that insulating devices installed and testing has been performed and that the isolation is effective.		
Evidence Guidance	CP records, written procedures(or lack there of), inspector observation, pictures		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.575**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.575 (c): Electrical isolation** **Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**		
Existing Code Language:	You must inspect and electrically test each electrical isolation to assure the isolation is adequate.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator should compile a list of all its electrical isolation locations and must inspect and test them periodically, at least each calendar year.		
Examples of a Violation	**A violation exists if:** 195.575(c) Operator did not demonstrate through inspection & electrical tests, that electrical isolation is adequate. The operator does not have records to show that testing has been performed and that the isolation is effective.		
Evidence Guidance	CP records, written procedures(or lack there of), inspector observation, pictures		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.575**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.575 (d): Electrical isolation** **Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**		
Existing Code Language:	If you install an insulating device in an area where a combustible atmosphere is reasonable to foresee, you must take precautions to prevent arcing.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Electrical isolation devices should not be installed in areas where a combustible atmosphere may exist unless suitable precautions are taken to prevent electrical arcing. Examples of such areas are: Vaults, buildings, other enclosed areas, etc Usually these situations would be found during the field inspection or after accidents. The O & M standard engineering drawing of vaults, buildings, and other enclosed areas, etc. should have cautionary notes regarding the installation of electrical devices in these areas. Some precautionary measures might include the installation of grounding cells or polarization cells.		
Examples of a Violation	An insulating device is installed in a area where a combustible atmosphere is anticipated and no precautions are taken.		
Evidence Guidance	Operator's procedure on insulating devices, maintenance records, photographs.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.575**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.575 (e): Electrical isolation** **Which facilities must I electrically isolate and what inspections, tests, and safeguards are required?**		
Existing Code Language:	If a pipeline is in close proximity to electrical transmission tower footings, ground cables, or counterpoise, or in other areas where it is reasonable to foresee fault currents or an unusual risk of lightning, you must protect the pipeline against damage from fault currents or lightning and take protective measures at insulating devices.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator must be aware of all electrical transmission tower footings, ground cables, etc. that are in close proximity to its pipeline. A testing program must be in place to test the possible adverse effects of high power transmission lines and ground cables.		
Examples of a Violation	**A violation exists if:** 195.575(e) The operator did not protect its pipeline against damage from fault currents or lightning and as such no protective measures at insulating devices are taken. Inspector should inquire if there are high voltage electrical transmission lines or substations adjacent to their pipeline and ask the operator what are the mitigating steps taken to protect the pipeline from fault currents and lightning. An engineering analysis should be performed to determine the effects of fault currents and lightning.		
Evidence Guidance	CP records, written procedures(or lack there of), inspector observation, pictures		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.577**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.577 (a): Interference currents - What must I do to alleviate interference currents?**		
Existing Code Language:	For pipelines exposed to stray currents, you must have a program to identify, test for, and minimize the detrimental effects of such currents.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The inspector should ask the operator if there are any foreign pipeline crossings or other structures that might subject the pipeline system to stray currents. Other potential stray current sources include direct current (DC) transit systems, DC mining operations, DC welding operations, and high voltage electric transmission systems. If so, then the operator must have a written plan to identify, test for, and minimize the detrimental effects of such currents. Annual test station surveys are generally insufficient to determine whether stray currents are present on the pipeline. An operator, particularly of a pipeline in a congested area with a lot of other cathodically protected structures, will generally need to perform close-interval surveys or turn suspected foreign rectifiers on and off to obtain sufficient information to determine whether stray currents are present on the pipeline. The operator must then take action to mitigate the detrimental effects of the stray current. Mitigative actions may include the installation of an interference bond between the structures, the addition of magnesium anodes to bleed away the stray current, recoating selected portions of one or both of the structures, reverse current switches, etc.		
Examples of a Violation	**A violation exists if:** 195.577(a) The operator does not have a written procedure to identify and test for stray current. If there are potential sources of interference , the operator should have records that show results of tests performed and that mitigating action was performed, if necessary. Lack of documentation regarding stray current identification and periodic testing. Leak record indicating interference as a cause.		
Evidence Guidance	O & M manual, maintenance records.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.577**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.577 (b): Interference currents - What must I do to alleviate interference currents?**		
Existing Code Language:	You must design and install each impressed current or galvanic anode system to minimize any adverse effects on existing adjacent metallic structures.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Note that this is a design requirement. When designing and installing a cathodic protection system, the operator should evaluate the potential for causing adverse effects on existing nearby structures. The operator's documentation should indicate that some effort was made to identify such structures and to perform testing, if necessary, after the installation to demonstrate that stray currents from the system are not adversely affecting any existing adjacent structures. If found to be, then the operator should cooperate with the owner of the foreign structure as necessary to mitigate the adverse effects. Mitigation measures may include galvanic anodes, bonds, coating, polarization cell, relocating pipeline or CP facilities.		
Examples of a Violation	**A violation exists if:** The operator did not design and install its impressed current type cathodic protection system or galvanic anode system to minimize the detrimental effects of stray currents. The operator did not perform any post-installation testing, particularly if requested by the owner of the existing structure.		
Evidence Guidance	Design documents and installation records. Cathodic protection records.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.579**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.579 (a): Internal corrosion control** **What must I do to mitigate internal corrosion?**		
Existing Code Language:	**General:** If you transport any hazardous liquid or carbon dioxide that would corrode the pipeline, you must investigate the corrosive effect of the hazardous liquid or carbon dioxide on the pipeline and take adequate steps to mitigate internal corrosion.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator should have a procedure to determine if the hazardous liquid or carbon dioxide being transported is corrosive. The procedure should identify the factors that influence the formation of internal corrosion. Special attention should be given to pipeline alignment features such as changes in elevation, low points, sharp bends, and dead legs that may contribute to internal corrosion by allowing water to settle out. Free water inside a pipeline can combine with carbon dioxide and hydrogen sulfide to form acids that cause serious damage to the internal surfaces of pipelines and their associated appurtenances. Microbiologically influenced corrosion (MIC) can also cause serious internal corrosion problems in pipelines. Bacterial colonies can form deposits on metal surfaces and produce organic acids that accelerate corrosion and cause localized pitting. Internal corrosion is more of a concern in crude oil pipelines than in refined products pipelines. Operators may have a pigging regime identified in their procedures to help mitigate the formation of internal corrosion. The operator should be sampling the solids and liquids that are removed during pigging operations for corrosivity. They should also have records to show that this information has been reviewed by qualified personnel.		
Examples of a Violation	**Violation exists if:** 1. The corrosive potential of the hazardous liquid or carbon dioxide is not determined by appropriate test. 2. Suitable monitoring methods are not used to determine the effectiveness of steps taken to minimize internal corrosion. 3. The operator did not investigate the corrosive effect of the hazardous liquid or carbon dioxide on its pipeline and as such failed to take adequate steps to mitigate internal corrosion.		
Evidence Guidance	Operator's corrosion control procedures, maintenance records, review of accident investigation records.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.579**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.579 (b): Internal corrosion control** **What must I do to mitigate internal corrosion?**		
Existing Code Language:	**Inhibitors:** If you use corrosion inhibitors to mitigate internal corrosion, you must: (1) Use inhibitors in sufficient quantity to protect the entire part of the pipeline system that the inhibitors are designed to protect; (2) Use coupons or other monitoring equipment to determine the effectiveness of the inhibitors; (3) Examine the coupons or other monitoring equipment at least twice each calendar year, but with intervals not exceeding 7 ½ months.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.579(b) The inspector should review procedures for testing to determine the existence or severity of internal corrosion associated with the pipelines. If the operator has determined that the potential for internal corrosion exists, they must take some mitigating action. If the operator chooses to use inhibitors to mitigate internal corrosion, they must take the additional required steps identified in 195.579 (b) to ensure its effectiveness. Some methods for monitoring internal corrosion are weight loss coupons, radiography, water chemistry tests, in-line inspection tools, and electrical, galvanic, resistance or hydrogen probes. Special attention should be given to specific conditions, including flow characteristics and pipeline configuration (especially dead legs, sags, and overbends) which are areas in a pipeline that may not be flushed or cleaned by pigging or other methods). Internal corrosion is influenced by flow regimen, pipeline configuration, operating temperature, water content, hydrogen sulfide content, oxygen, bacteria and sediment deposits. **Violation exists if:** Suitable monitoring methods are not used to determine the effectiveness of steps taken to minimize internal corrosion.		
Examples of a Violation	The operator did not use inhibitors in sufficient quantity as a selected means of monitoring internal corrosion, to protect the entire pipeline system. The coupons or other monitoring equipment as used to monitor the internal corrosion, did not determine the effectiveness of the inhibitors. The operator did not examine its monitoring coupons at least twice each calendar year but with intervals not exceeding 7 ½ months.		
Evidence Guidance	Operator' internal corrosion control procedures, maintenance records, manufacturer's recommended practice.		

Other Special Notations	None

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.579**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.579 (c): Internal corrosion control** **What must I do to mitigate internal corrosion?**		
Existing Code Language:	**Removing pipe:** Whenever you remove pipe from a pipeline, you must inspect the internal surface of the pipe for evidence of corrosion. If you find internal corrosion requiring corrective action under § 195.585, you must investigate circumferentially and longitudinally beyond the removed pipe(by visual examination, indirect method, or both) to determine whether additional corrosion requiring remedial action exists in the vicinity of the removed pipe.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Any time a pipe section is removed or cut an inspection for corrosion inside the pipe must be performed. If corrosion is found to be occurring on the inside surface of the pipeline then remaining strength calculations should be performed and the line segment de-rated, replaced or repaired according to the extent of internal corrosion found. If internal corrosion is found, the operator must have a program for mitigation.		
Examples of a Violation	**Violation of 195.579(c) exists if:** The operator does not have records to show that an internal inspection of a removed section of pipe occurred. Internal corrosion was found by inspection of a removed section of pipe and the operator failed to determine the extent and determine if additional pipe must be removed, identified the cause of the corrosion and take steps to correct the problem. If internal corrosion is found, and the operator does not have a program for mitigation. The operator did not inspect the internal surface of the removed segment of the pipeline for evidence of internal corrosion. The operator did not investigate circumferentially and longitudinally beyond the removed pipe to determine whether additional corrosion requiring remedial action exists in the vicinity of the removed pipe.		
Evidence Guidance	Operator dig records, Operator program for monitoring internal corrosion, Remedial/corrective action records.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.579**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.579 (d): Internal corrosion control What must I do to mitigate internal corrosion?**		
Existing Code Language:	Breakout tanks: After October 2, 2000, when you install a tank bottom lining in an aboveground breakout tank built to API Specification 12F, API Standard 620, or API Standard 650 (or its predecessor Standard 12C), you must install the lining in accordance with API Recommended Practice 652. However, installation of the lining need not comply with API Recommended Practice 652 on any tank for which you note in the corrosion control procedures established under §195.402(c)(3) why compliance with all or certain provisions of API Recommended Practice 652 is not necessary for the safety of the tank.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.579(d) Inspector should review operator's procedures and records for installation of linings in aboveground breakout tanks. API Recommended Practice 652 is commonly utilized by industry and the inspector should be familiar with its requirements. If an operator states in their procedures that they are not going to comply with this Recommended Practice, the inspector should seek advice from a senior inspector.		
Examples of a Violation	The operator did not install the tank bottom lining in accordance with API Recommended Practice 652 after October 2, 2000, if the tank bottom is built to API Specification 12F, API Standard 620 or API Standard 650.		
Evidence Guidance	Operator's internal corrosion procedure, maintenance records.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.581**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.581 (a): Atmospheric corrosion control - Which pipelines must I protect against atmospheric corrosion and what coating material may I use?**		
Existing Code Language:	You must clean and coat each pipeline or portion of pipeline that is exposed to the atmosphere, except pipelines under paragraph ©) of this section.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96; Glossary		
Guidance Material	A pipeline exposed to the atmosphere is a pipeline that is not buried or submerged in an electrolyte such as soil or seawater. Atmospheric Corrosion is an area of metal loss due to extensive general corrosion, localized corrosion pitting, or peeling scale on the steel surface that has damaged the pipe. Surface oxide is corrosion and, if allowed to continue, may affect the safe operation of the pipeline at some point in the future. Oxidation (or "light surface oxide") can be defined as the slow rusting of pipe which is not yet considered to be atmospheric corrosion because there is no evidence of metal loss at this time.		
Examples of a Violation	**A Violation exists if:** 1. The operator did not determine areas of atmospheric corrosion. 2. The operator did not take remedial actions once atmospheric corrosion is found. 3. The operator has no procedures for locating and remediating areas of atmospheric corrosion.		
Evidence Guidance	Pictures, operator's personnel statements, maintenance records, pit depth measurement, documented evidence of pipe wall loss.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.581**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.581 (b): Atmospheric corrosion control - Which pipelines must I protect against atmospheric corrosion and what coating material may I use?**		
Existing Code Language:	Coating material must be suitable for the prevention of atmospheric corrosion.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Typical coating materials are non-conductive paints, coatings, or jackets which will isolate the metal from the atmosphere. In order to prevent atmospheric corrosion, the coating material's physical, chemical and electrical characteristics must be evaluated before its application.		
Examples of a Violation	**A Violation exists if:** 1. The operator did not coat areas of aboveground pipe with a suitable material. 2. The coating material is found unsuitable for the prevention of atmospheric corrosion. 3. The operator did not take remedial actions if the paint or coating is in poor condition and atmospheric corrosion is occurring. 4. The operator has no purchase orders or specifications for coating materials.		
Evidence Guidance	Pictures, operator's personnel statements, purchase orders, specifications.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.581**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.581 (c): Atmospheric corrosion control - Which pipelines must I protect against atmospheric corrosion and what coating material may I use?**		
Existing Code Language:	Except portions of pipelines in offshore splash zones or soil-to-air interfaces, you need not protect against atmospheric corrosion any pipeline for which you demonstrate by test, investigation, or experience appropriate to the environment of the pipeline that corrosion will: (1) Only be a light surface oxide; or (2) Not affect the safe operation of the pipeline before the next scheduled inspection.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	"Light surface oxide" is general oxidation of the metal where there is no associated loss of metal. Some corrosion experts consider a light surface oxide to be protective to the metal surface. The exceptions do not include offshore splash zones (where tides and wave actions intermittently impact the pipe) and soil-to-air interfaces (where the pipe first leaves the soil and is exposed to the atmosphere. These areas are critical because of the transient conditions and must be protected from atmospheric corrosion. Protection is typically accomplished by ensuring that the pipe is coated and painted several inches (or feet, in the offshore case) above and below these interfaces.		
Examples of a Violation	**A Violation exists if:** 1. The operator has no tests, investigations, or demonstrated experience that unprotected pipe exposed to the atmosphere does not require coating or painting. 2. The operator did not provide protection to offshore splash zones and/or soil-to-air interfaces, as appropriate.		
Evidence Guidance	Pictures, operator's personnel statements, records, documented evidence of pipe wall loss at interfaces.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.583**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.583 (a): Atmospheric corrosion control: Monitoring** **What must I do to monitor atmospheric corrosion control?**		
Existing Code Language:	(a) If a pipeline or portion of pipeline is exposed to the atmosphere, you must inspect the pipeline or portion of pipeline at the following intervals for evidence of atmospheric corrosion: Onshore pipelines: At least once every 3 calendar years, but with intervals not exceeding 39 months. Offshore pipelines: At least once each calendar year, but with intervals not exceeding 15 months.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator must have procedures specifying the required time intervals for inspecting all aboveground piping facilities, and subsequent inspection and maintenance records meeting the stated intervals.		
Examples of a Violation	**A Violation exists if:** The operator has no monitoring procedures or dated maintenance records which meet the required inspection intervals.		
Evidence Guidance	Maintenance records, O&M Procedures Manual, operator's personnel statements.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.583**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.583 (b): Atmospheric corrosion control: Monitoring** **What must I do to monitor atmospheric corrosion control?**		
Existing Code Language:	During inspections you must give particular attention to pipe at soil-to-air interfaces, under thermal insulation, under disbonded coating, at pipe supports, in splash zones, at deck penetrations, and in spans over water.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	Industry Standards/Glossary		
Guidance Material	For onshore pipelines, particular attention shall be given to corrosion at soil-to-air interfaces, under thermal insulation, under disbonded coatings, and at pipe supports. For offshore pipelines, particular attention shall be given to corrosion under disbonded coatings, in splash zones, at pipe supports, and at wall and deck penetrations. All spans over water shall be inspected. Operators shall specify these locations in O&M procedures and inspection records. The most difficult areas to inspect may be under pipe supports and under thermal insulation.		
Examples of a Violation	**A Violation exists if:** The operator did not provide for these specific areas in their procedures or include these areas when performing inspections of aboveground facilities. Atmospheric corrosion is found at one or more of the specified areas.		
Evidence Guidance	Pictures, maintenance records, pit measurements, pipe wall measurements, O&M Procedures Manual, operator's personnel statements.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.583**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.583(c): Atmospheric corrosion control: Monitoring** **What must I do to monitor atmospheric corrosion control?**		
Existing Code Language:	If you find atmospheric corrosion during an inspection, you must provide protection against the corrosion as required by Sec.195.581.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	If the operator identified areas of atmospheric corrosion during an inspection, those areas must be protected before the next scheduled inspection. However, if the corrosion is severe, remediation or replacement of the pipe or components may be necessary before coating or jacketing is performed.		
Examples of a Violation	**A Violation exists if:** The operator did not correct areas of atmospheric corrosion found during an inspection. If necessary, the operator did not replace corroded pipe or components before protecting for atmospheric corrosion.		
Evidence Guidance	Pictures, maintenance records, O&M Procedures Manual, operator's personnel statements.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.585**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.585 (a): Remedial Measures - What must I do to correct corroded pipe?**		
Existing Code Language:	**General corrosion**: If you find pipe with general corrosion and with a remaining wall thickness less than that required for the maximum operating pressure of the pipeline, you must replace the pipe. However, you need not replace the pipe if you: (1) Reduce the maximum operating pressure commensurate with the strength of the pipe needed for serviceability based on actual remaining wall thickness; or (2) Repair the pipe by a method that reliable engineering tests and analyses show can permanently restore the serviceability of the pipe.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Review all segments of the pipeline for internal, external or atmospheric corrosion that has reduced the wall thickness to less than that required for the maximum operating pressure of the pipeline. The operator should have all the records on the replaced segments, repairs and appropriately reduced pressures. The source of these information are: pig logs, exposed pipe reports, etc. Note: See also § 195.452(h), repair criteria for IMP in HCA's.		
Examples of a Violation	**A Violation exists if:** The operator did not repair or replace a generally corroded segment of pipe. The remaining strength of the pipe segment is not computed based on actual remaining wall thickness. No Safety related condition report filed for generally corroded pipe.		
Evidence Guidance	Repair records, pictures		
Other Special Notations	**Inspector Note:** If an operator has generally corroded pipe that is stated to be effectively coated and cathodically protected under subpart H, the inspector should question the effectiveness of the cathodic protection. Reference 195.571(a) for CP criterion used Compare leak records to CP records (location). Does the operator consider IR Drop? How? For generally corroded pipe: a safety -related condition report is to be filed in writing within five working days after the day a representative of the operator first determines that the condition exists, but not later than 10 working days after the day a representative of the operator discovers the condition.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.585**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.585 (b): Remedial Measures - What must I do to correct corroded pipe?**		
Existing Code Language:	Localized corrosion pitting: If you find pipe that has localized corrosion pitting to a degree that leakage might result, you must replace or repair the pipe, unless you reduce the maximum operating pressure commensurate with the strength of the pipe based on actual remaining wall thickness in the pits.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	Review areas of localized corrosion pitting in terms of repair or reduction in pressure.		
Examples of a Violation	**A Violation exists if:** No reduction in the pressure based on localized corrosion pitting. The remaining strength of the pipe segment is not computed based on actual remaining wall thickness.		
Evidence Guidance	Repair records, pictures		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.587**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.587: Remedial Measures: Remaining strength** **What methods are available to determine the strength of corroded pipe?**		
Existing Code Language:	Under §195.585, you may use the procedure in ASME B31G, Manual for Determining the Remaining Strength of Corroded Pipelines, or the procedure developed by AGA/Battelle, A Modified Criterion for Evaluating the Remaining Strength of Corroded Pipe (with RSTRENG disk), to determine the strength of corroded pipe based on actual remaining wall thickness. These procedures apply to corroded regions that do not penetrate the pipe wall, subject to the limitations set out in the respective procedures.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	The operator should have a procedure on the strength of the pipeline based on actual remaining wall thickness and it may be determined by ASME/ANSI B31G or A Modified Criterion for Evaluating the Remaining Strength of Corroded Pipe (RSTRENG disk).		
Examples of a Violation	No procedure on the strength of the pipeline based on actual remaining wall thickness.		
Evidence Guidance	O&M Manual, ASME/ANSI B31G, RSTRENG disk.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.589**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.589 (a): Records - What corrosion control information do I have to keep ?**		
Existing Code Language:	(a) You must maintain current records or maps to show the location of: (1) Cathodically protected pipelines. (2) Cathodic protection facilities, including galvanic anodes, installed after 30 days after the rule's effective date. (3) Neighboring structures bonded to cathodic protection system.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.589(a)(1) The inspector should review the operator's records or maps of all its cathodically protected pipelines to ensure the operator is updating them. 195.589(a)(2) The inspector should review the operator's records or maps of its cathodic protection facilities and galvanic anodes installed after January 28, 2002. CP facilities include rectifiers, test stations, bonds, etc. The inspector should review the records to ensure that changes reflected in rectifier readings correspond to P/S changes in that area. .		
Examples of a Violation	**A Violation exists if:** 195.589(a) An operator has not retained records or maps showing location of cathodically protected piping, facilities, and neighboring structures bonded to the cathodic protection system.		
Evidence Guidance	O&M Manual, Maintenance records, maps, inspector's observations.		
Other Special Notations	**Inspector Note:** An operator may choose to isolate and separately cathodically protect segments of their pipeline system. For example, pump station piping may be isolated and separately cathodically protected from their pipeline. The operator should have records to show when this is done.		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H**: **CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.589**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.589 (b): Records - What corrosion control information do I have to keep ?**		
Existing Code Language:	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.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.589(b) The inspector should review the operator's maps or records including cathodically protected piping, cathodic protection facilities, galvanic anodes installed after January 28, 2002, and neighboring structures bonded to the cathodic protection system. The records may be kept in either electronic or hard copy format. These records must be retained as long as the pipelines remain in service.		
Examples of a Violation	**A Violation exists if:** 195.589(b) An operator has not retained records of each test, survey, or inspection required.		
Evidence Guidance	O&M Manual, Maintenance records, maps, inspector's observations.		
Other Special Notations	None		

Enforcement Manual, Code Compliance Guidelines **PART 195, SUBPART H: CORROSION CONTROL**			Date: 11/17/2005 Revised:11/17/2005
Code Reference Number	**195.589**	**Corrosion Control Procedure Rewrite committee**	
Heading	**§195.589 c): Records - What corrosion control information do I have to keep ?**		
Existing Code Language:	You must maintain a record of each analysis, check, demonstration, examination, inspection, investigation, review, survey, and test required by this subpart in sufficient detail to demonstrate the adequacy of corrosion control measures or that corrosion requiring control measures does not exist. You must retain these records for at least 5 years, except that records related to §195.569, §195.573(a) and (b), and §195.579(b)(3) and c) must be retained for as long as the pipeline remains in service.		
Origin of Code	HLPLSA 1979		
Last FR Amendment	Amdt 195-73, 66 FR 66994, Dec. 27, 2001		
Enforcement Language	None		
Pending NPRM	None		
Interpretation 1 Excerpts	None		
Other Ref. Material & Source	NACE RP-01-69-96		
Guidance Material	195.589(c) The operator also shall maintain a record of each test, survey, and inspection in sufficient detail to demonstrate the adequacy of their corrosion control procedures. Sufficient detail is recognized to mean that the data is error free, has been interpreted correctly and demonstrate that the operator's corrosion control systems for atmospheric, internal, and external corrosion are adequate.		
Examples of a Violation	**A Violation exists if:** 195.589(c) The operator has not maintained a record of each test, survey, and inspection in sufficient detail to demonstrate the adequacy of their corrosion control procedures or that a corrosive condition does not exist. These records must be retained for at least 5 years, except that records related to §195.569, §195.573(a) and (b), and §195.579(b)(3) and (c) must be retained for as long as the pipeline remains in service. Inspector must determine the length of time for violations and determine the extent of such violations.		
Evidence Guidance	O&M Manual, Maintenance records, maps, inspector's observations.		
Other Special Notations	None		