



REGISTRATION  
1/14/08

## BEAR PAW ENERGY, LLC

A SUBSIDIARY OF ONEOK PARTNERS, L.P.

January 11, 2008

VIA FEDERAL EXPRESS

Mr. Chris Hoidal  
Director, Western Region  
Pipeline and Hazardous Materials Safety Administration  
U.S. Department of Transportation  
12300 W. Dakota Ave., Suite 110  
Lakewood, CO 80228

Re: CPF 5-2007-5044M

Dear Mr. Hoidal:

Bear Paw Energy, LLC ("BPE") received a Notice of Amendment ("Notice") relating to CPF-5-2007-5044M in our Tulsa offices on December 17, 2007. The Notice is in follow up to inspection of BPE's operations and maintenance procedures for its Riverview Pipeline. The inspection was conducted on June 13, 2007 and July 18, 2007 by a representative of the Pipeline and Hazardous Materials Safety Administration ("PHMSA") pursuant to Chapter 601 of 49 United States Code of Federal Regulations. The Notice cites eleven (11) apparent inadequacies in BPE's procedures. Specific inadequacies cited and BPE's responses are as follows.

1. **§195.5 Conversion to service subject to this part.**
  - (a) **A steel pipeline previously used in service not subject to this part qualifies for use under this part if the operator prepares and follows a written procedure to accomplish the following:**
    - (1) **The design, construction, operation, and maintenance history of the pipeline must be reviewed and, where sufficient historical records are not available, appropriate tests must be performed to determine if the pipeline is in satisfactory condition for safe operation. If one or more of the variables necessary to verify the design pressure under §195.106 or to perform the testing under paragraph (a) (4) of this section is unknown, the design pressure may be verified and the maximum operating pressure determine by-**

- (i) Testing the pipeline in accordance with ASME B31.8, Appendix N, to produce a stress equal to the yield strength; and**
- (ii) Applying, to not more than 80 percent of the first pressure that produces a yielding, the design factor F in §195.106(a) and the appropriate factors in §195.106(e).**
- (2) The pipeline right-of-way, all aboveground segments of the pipeline, and appropriately selected underground segments must be visually inspected for physical defects and operating conditions which reasonably could be expected to impair the strength or tightness of the pipeline.**
- (3) All known unsafe defects and conditions must be corrected in accordance with this part.**
- (4) The pipeline must be tested in accordance with the subpart E of this part to substantiate the maximum operating pressure permitted by §195.406.**
- (b) A pipeline that qualifies for use under this section need not comply with the corrosion control requirements of subpart H of this part until 12 months after it is placed into service, notwithstanding any previous deadlines for compliance.**
- (c) Each operator must keep for the life of the pipeline a record of the investigations, tests, repairs, replacements, and alterations made under the requirements of paragraph (a) of this section.**

BPE has a form to be documented during a conversion of service activity however the form does not give adequate instructions to operator personnel on how to satisfactorily complete the conversion. An operator is required to have procedures that will provide detailed instructions to employees during conversion to service activities.

BPE Response to Item 1:

The following language is found in the BPE O&M Manual on page 3-8 in Section 3.1, "General Procedures":

"Pipeline facilities will be abandoned according to ONP TG1602.204 'Inactive and Abandoned Pipeline Management.' This Tech Guideline provides directive to employees involved in converting an abandoned or inactive pipeline into service."

BPE will revise this language as follows:

"Pipeline facilities will be abandoned or **converted** to service according to ONP TG1602.204 'Inactive and Abandoned Pipeline Management.'"

Note: The following document is enclosed for your reference: ONP TG1602.204, "Inactive and Abandoned Pipeline Management."

2. **§195.402 Procedural manual for operations, maintenance, and emergencies.**  
**(c) Maintenance and normal operations. The manual required by paragraph (a) of this section must include procedures for the following to provide safety during maintenance and normal operations:**  
**(3) Operating, maintaining, and repairing the pipeline system in accordance with each of the requirements of this subpart and subpart H of this part.**

**And**

**§195.422 Pipeline Repairs.**

- (a) Each operator shall, in repairing its pipeline systems, ensure that the repairs are made in a safe manner and are made so as to prevent damage to persons or property.**

The following procedure was inadequate to address welding of pipeline repairs:

**§195.226 Welding: Arc burns.**

- (c) A ground may not be welded to the pipe or fitting that is being welded.**

The adopted ONEOK welding procedure TG 1602.201 Appendix, Welding Pipelines states that welding of the ground wire to the pipe *should* not be allowed. Federal pipeline regulations mandate that welding of a ground wire to the pipe *must not* be allowed.

BPE Response to Item 2:

BPE will make the following change to TG1602.201 "ONP Welding Manual" Appendix B, Page B-1:

"Note: Welding the ground lead of the welding unit to the carrier pipe results in arc burn and therefore **must** not be allowed."

3. **§195.402 Procedural manual for operations, maintenance, and emergencies.**  
**(a) General. Each operator shall prepare and follow for each pipeline system a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies. This manual shall be reviewed at intervals not exceeding 15 months, but at least once each calendar year, and appropriate changes made as necessary to insure that the manual is effective. This manual shall be prepared before initial operations of a pipeline commence, and appropriate parts shall be kept at locations where operations and maintenance activities are conducted.**

BPE's manual Section 3.1 General Provisions, page 3-2 only requires a review of normal operation procedures annually. Federal regulation requires that procedures for normal operation as well as those for maintenance and emergencies be reviewed once each calendar year not to exceed 15 months.

BPE Response to Item 3:

The following language is found in the BPE O&M Manual on page 3-2 in Section 3.1, "General Procedures":

"The Bear Paw Manager or his/her designee shall be responsible for conducting a review of the work done by personnel, incidents and near miss reports to determine the effectiveness of operating procedures at intervals not exceeding 15 months, but at least once each calendar year. Suggested changes or improvement to the procedures discussed during the review shall be forwarded to Bear Paw Manager or his/her designee to be considered for incorporation into the procedures.

"The annual review consists of a review of maintenance and normal operations procedures."

BPE will revise this language as follows:

"The annual review consists of a review of maintenance and normal operations procedures as well as Emergency Response procedures."

4. **§195.402 Procedural manual for operations, maintenance, and emergencies.**  
**(c) Maintenance and normal operations. The manual required by paragraph (a) of this section must include procedures for the following to provide safety during maintenance and normal operations:**  
**(7) Starting up and shutting down any part of the pipeline in a manner designed to assure operation within the limits prescribed by paragraph §195.406, consider the hazardous liquid or carbon dioxide in transportation, variations in altitude along the pipeline, and pressure monitoring and control devices.**

The current BPE manual for normal operations does not contain a procedure for starting up and shutting down their Riverview pipeline. There is no shutdown procedure in the operations manual.

5. **§195.402 Procedural manual for operations, maintenance, and emergencies.**  
**(c) Maintenance and normal operations. The manual required by paragraph (a) of this section must include procedures for the following to provide safety during maintenance and normal operations:**  
**(8) In the case of pipeline that is not equipped to fail safe, monitoring from an attended location pipeline pressure during startup until steady state pressure and flow conditions are reached and during shut-in to assure operation within limits prescribed by §195.406.**

The BPE manual does not give adequate direction to require monitoring of pipeline pressures during startup and during shut-in to ensure that pressures remain within the limits prescribed in §195.406.

BPE Response to Items 4 and 5:

BPE has addressed items 4 and 5 with the completion of two procedures for start up and shut down of the Riverview Pipeline. BPE will add the following statement to BPE O&M Manual Section 3.1, "General Procedures," page 3-3:

"Pipeline Start Up and Shut Down 195.402(c)(7)-(8)  
BPE will refer to procedure P195.402(c)SU and P195.402(c)SD for proper start up, monitoring, and the shutting down of the Riverview Pipeline."

Note: The following documents are enclosed for your reference: 195.402(c)SU, "Starting Up Riverview Pipeline," and 195.402(c)SD, "Shutting Down Riverview Pipeline."

6. **§195.402 Procedural manual for operations, maintenance, and emergencies.**  
**(c) Maintenance and normal operations. The manual required by paragraph (a) of this section must include procedures for the following to provide safety during maintenance and normal operations:**

**(11) Minimizing the likelihood of accidental ignition of vapors in areas near facilities identified under paragraph (c)(4) of this section where the potential exists for the presence of flammable liquids or gases.**

BPE manual Section 3.2 Design and Operating Parameters does not provide adequate direction for minimizing the likelihood of accidental ignition of vapors in areas that would require an immediate response by the operator to prevent hazards to the public if the facilities failed or malfunctioned. An operator is required to at least list common practices to be taken that will minimize the likelihood of accidental ignition of vapors in areas that would require an immediate response by the operator to prevent hazards to the public if the facilities failed or malfunctioned.

BPE Response to Item 6:

BPE's O&M Manual addresses this item in Section 2.3, "Emergency Action Plan," rather than in Section 3.2, "Design and Operating Parameters." The BPE O&M Manual addresses 195.402(c)(11) with the following statements on page 4 of Section 2.3, "Emergency Action Plan":

"Based on event particulars, an evacuation may be required. The person reporting a potential emergency shall identify the type and location of the emergency and may announce an immediate evacuation.

"If the situation calls for an immediate evacuation, company personnel should ensure the following actions take place:

- "Evacuate everyone to an upwind or crosswind location
- "Do not attempt to start any vehicles in the vicinity of the leak or spill
- "Do not drive into or near a vapor cloud
- "Eliminate ALL ignition sources

"Once you have reached a safe location, immediately contact the Pipeline Control Center, they will begin the process of contacting your supervisor and all applicable emergency response agencies."

7. **§195.402 Procedural manual for operations, maintenance, and emergencies.**  
**(e) Emergencies. The manual required by paragraph (a) of this section must include procedures for the following to provide safety when an emergency condition occurs;**  
**(3) Having personnel, equipment, instruments, tools, and material available as needed at the scene of an emergency.**

BPE's Emergency Action Plan discusses personal protection equipment (PPE) and first aid equipment and then states, "Additional equipment will be furnished by emergency responders at the scene of an incident." There is no list of possible equipment that would most likely be required during an emergency nor are there any locations of where anticipated emergency equipment could be obtained.

An operator's emergency procedures must have sufficient detail to provide guidance to those responding to emergencies so they will know where anticipated emergency response equipment resides and how to obtain it.

BPE Response to Item 7:

The following language is found in the BPE O&M Manual on page 7 in Section 2.3, "Emergency Action Plan":

"Current emergency equipment consists of first-aid kits and fire extinguishers. Additional equipment will be furnished by emergency responders at the scene of an incident."

BPE will revise this statement as follows:

"Current emergency equipment including but not limited to Fire Extinguishers, First Aid Kits, multi gas monitors, phones, radio and maps located in company vehicles as well as Fire Extinguishers located at the Riverview Terminal and the Grasslands Complex. There is (1) Safety Trailer dedicated for the Riverview pipeline located at the Grasslands complex as well as (1) safety trailer dedicated to the Grasslands complex located at the Grasslands complex. There are also (2) Safety Trailers used by the construction segment of BPE which may be located at any site within our business unit and which could be brought in and utilized if needed in an emergency. All (4) trailers contain fire extinguishers, 3 way monitors, safety harnesses and ropes as well as supplied breathing air. Any additional fire fighting equipment will be furnished by responding local emergency response equipment and personnel."

8. **§195.402 Procedural manual for operations, maintenance, and emergencies.**  
**(e) Emergencies. The manual required by paragraph (a) of this section must include procedures for the following to provide safety when an emergency condition occurs;**  
**(7) Notifying fire, police, and other appropriate public officials of hazardous liquid or carbon dioxide pipeline emergencies and coordinating with them preplanned and actual responses during an emergency, including additional precautions necessary for an emergency involving a pipeline transporting a highly volatile liquid.**

BPE's Emergency Action Plan does not describe preplanned precautions that have been coordinated with the responding fire, police, and other appropriate public officials in the event of a HVL emergency.

An operator is not only required to perform preplanning of precautions to be taken in the event of an HVL emergency with public officials, they are also required to describe those preplanned precautions in their emergency response procedures.

BPE Response to Item 8:

The following language is found in the BPE O&M Manual on page 13 in Section 2.3., "Emergency Action Plan":

"In addition, all employees, as required by role, will participate in an annual emergency response drill. **(Note:** These drills will be in the form of a table-top, equipment deployment, or simulation. If the employee has responded to an actual incident, this will satisfy the requirement provided proper documentation has been provided).

BPE will revise this language as follows:

In addition, all employees, as required by role, will participate in an annual emergency response drill. **(Note:** These drills will be in the form of a table-top, equipment deployment, or simulation and will include Local Emergency Officials. During this drill it will be discussed what the role of Emergency Officials are and the hazards faced by them during a response to an emergency. If the employee has responded to an actual incident, this will satisfy the requirement provided proper documentation has been provided).

9. **§195.557 Which pipelines must have coating for external corrosion control?**  
**(b) Converted under Sec. 195.5 and--**  
**(1) Has an external coating that substantially meets Sec. 195.559 before the pipeline is placed in service; or**  
**(2) Is a segment that is relocated, replaced, or substantially altered.**

BPE manual Section 3.3 Corrosion Prevention does not adequately address coating requirements for pipelines that are being converted to hazardous liquid service, or are being relocated, replaced, or substantially altered.

An operator must have guidance that requires adequate coating if a pipeline is relocated, replaced or substantially altered or if a pipeline had coating meeting §195.559 before it was converted to service.

BPE Response to Item 9:

The following language is found in the BPE O&M Manual on page 3-34 in Section 3.3., "Corrosion Prevention":

"Buried or submerged pipelines constructed, relocated, replaced, or otherwise changed after March 31, 1970 on an interstate pipeline, or October 20, 1985 on an intrastate pipeline, except bottoms of aboveground breakout tanks, must have an external coating for corrosion control that meets the following criteria.

- "Be designed to mitigate corrosion of the buried or submerged pipeline.
- "Have sufficient adhesion to the metal surface to prevent under film migration of moisture.
- "Be sufficiently ductile to resist cracking.
- "Have enough strength to resist damage due to handling and soil stress."

BPE will add the following language to the preceding statement:

"Note: For pipeline conversion to service, refer to ONP TG1602.204, 'Inactive and Abandoned Pipeline Management.'"

In ONP TG1602.204, "Inactive and Abandoned Pipeline Management," ONP TG1603.206, "Cathodic Protection Criteria and Requirements for Survey and Remedial Action Technical Guideline," is referenced for guidance in coating requirements for pipelines converted to service.

Note: The following documents are enclosed for your reference: TG1603.206, "Cathodic Protection Criteria and Requirements for Survey and Remedial Action Technical Guideline," and ONP TG1602.204, "Inactive and Abandoned Pipeline Management."



10. **§195.563 Which pipelines must have cathodic protection?**  
b) **Each buried or submerged pipeline converted under Sec. 195.5 must have cathodic protection if the pipeline--**  
(1) **Has cathodic protection that substantially meets Sec. 195.571 before the pipeline is placed in service; or**  
(2) **Is a segment that is relocated, replaced, or substantially altered.**

BPE manual Section 3.3 Corrosion Prevention does not adequately address cathodic protection requirements for pipelines that are being converted to hazardous liquid service, or are being relocated, replaced, or substantially altered.

An operator must have guidance that requires adequate cathodic protection if a pipeline is relocated, replaced or substantially altered or if a pipeline had cathodic protection meeting §195.571 before it was converted to service.

BPE Response to Item 10:

The following language is found in the BPE O&M Manual on page 3-34 in Section 3.3., "Corrosion Prevention":

"2. The Cathodic Protection Supervisor or designee will review the evaluation and will initiate appropriate remedial action. Remedial action will be completed pursuant to **ONP TG1603.206**, 'Cathodic Protection Criteria and Requirements for Survey and Remedial Action.'"

Note: The following document is enclosed for your reference: TG1603.206, "Cathodic Protection Criteria and Requirements for Survey and Remedial Action Technical Guideline."

11. **§195.567 Which pipelines must have test leads and what must I do to install and maintain the leads?**  
(c) **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 Sec. 195.571.**

BPE manual Corrosion Prevention does not provide detailed instruction to operator personnel on how to maintain test leads. The current BPE manual references §195.567(c) for those instructions. Referencing §195.567 "alone" is not sufficient guidance to operator personnel for ensuring test leads are maintained so that electrical measurements can be taken.

BPE Response to Item 11:

The following language is found in the BPE O&M Manual on page 3-36 in Section 3.3., "Corrosion Prevention":

"Test leads or stations are required to be maintained according to 195.567(c). Bear Paw must document all repairs and maintenance to test stations."

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BPE will add the following language to BPE O&M Manual Section 3.3, "Corrosion Prevention", page 3-37:

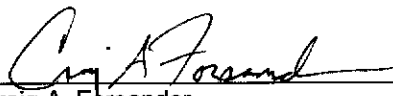
"Test leads or stations are required to be maintained according to 195.567(c). Bear Paw will refer to ONP TG 1602.206, "Cathodic Protection Design and Installation Requirements", page 22 and 23, for guidance with test station maintenance and must document all repairs and maintenance to test stations as required by the technical guide."

Note: The following document is enclosed for your reference: TG1603.206, "Cathodic Protection Criteria and Requirements for Survey and Remedial Action Technical Guideline."

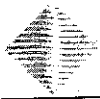
All proposed changes herein will be finalized and incorporated to Bear Paw's O&M Manual and Technical Guidelines as applicable by January 31, 2008. Please advise of any questions or concerns regarding our response to the subject Notice. I can be reached at (918) 588-7414 if you wish to discuss further.

Sincerely,

BEAR PAW ENERGY, LLC

By:   
Craig A. Forsander  
Vice President  
Natural Gas Gathering & Processing Operations

CAF:jr  
Enclosures



## Inactive and Abandoned Pipeline Management

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## 1.0 SCOPE

This Technical Guideline establishes the following requirements for ONP operated hazardous liquid Pipelines.

- Inactive and Abandoned Pipeline listing requirements.
- Requirements for deactivation of Pipelines.
- Periodic maintenance and operational activities required for Inactive Pipelines.
- Requirements for abandoning a Pipeline.
- Requirements for reactivating an Inactive Pipeline.

The requirements established in this Technical Guideline apply when ONP deactivates, abandons, or reactivates a Pipeline on or after the effective date of this Technical Guideline.

Deviations from this Technical Guideline must follow the deviation process defined in ONP TG010.100, Development and Use of ONP Standards and Technical Guidelines.

## 2.0 DEFINITIONS

**Abandoned** – A Pipeline that ONP will not reactivate and for which an abandonment plan, as defined in this Technical Guideline, has been executed.

**Disconnected** – A Pipeline is disconnected when the piping is physically separated from the active piping.

**Inactive-Regulated** – An Inactive Pipeline that is under the jurisdiction of the U.S. Department of Transportation (DOT) or the Texas Railroad Commission (RRC) or other State agency.

**Inactive** – A Pipeline with service discontinued and has no contractual obligation for operation that ONP has intention to reactivate or sell in the future.

**Isolated** – A Pipeline is isolated when the piping is Disconnected or when a skillet blind (blinking plate) is installed between the active and inactive piping. A closed and locked valve is not a method for isolating an Inactive Pipeline.

**ONP** – ONEOK NGL Pipeline, L.P.

**Pipeline** - Piping between pump, booster, or valve station that extends from station outlet valve to station inlet valve.

**Shall, Must, Will** – Mandatory requirements.

**Should**– A highly preferred or recommended action or methodology.

**Technical Team** – The Inactive Pipeline Management Technical Team.



### 3.0 RESPONSIBILITIES

#### 3.1 Inactive and Abandoned Pipeline Coordinator

The Inactive and Abandoned Pipeline Coordinator is responsible for:

- Their division's implementation and compliance with this Technical Guideline.
- Creation and maintenance of the Inactive and Abandoned Pipeline List.
- Serving as the Technical Team member for their division.
- Review of reactivation plans and direct the notification of pertinent division personnel.

#### 3.2 Prevention, Maintenance, and Inspection Execution Leader

The Prevention, Maintenance, and Inspection (PMI) Execution Leader is responsible for the review of reactivation plans.

#### 3.3 Inactive and Abandoned Pipeline Management Technical Team

The Inactive and Abandoned Pipeline Management Technical Team is responsible for maintaining this Technical Guideline and reviewing deviation requests as necessary.

### 4.0 PROCEDURES AND KEY ELEMENTS

#### 4.1 General Process Overview

This Technical Guideline defines the requirements for deactivating and subsequent maintenance of an ONP operated Pipeline, abandoning a Pipeline, and reactivating an inactive Pipeline. These requirements are summarized below.

Change in status of a Pipeline such as from active to Inactive or Inactive to Abandoned requires a management of change review in accordance with ONP TG1450.100, ONP Management of Change.

REQUIREMENTS FOR CHANGE IN STATUS TO	
INACTIVE	ABANDONED
<ul style="list-style-type: none"> <li>• Make necessary applications and notifications.</li> <li>• Management of Change Review</li> <li>• Deactivate the Pipeline               <ul style="list-style-type: none"> <li>- Isolate piping from active piping.</li> <li>- Displace the product.</li> <li>- Fill piping with an inert material.</li> </ul> </li> <li>• Maintain Inactive Pipelines according to Table 1, Maintenance Requirements for Inactive Pipelines.</li> <li>• Update Inactive and Abandoned Pipeline List</li> </ul>	<ul style="list-style-type: none"> <li>• Review of Pipeline Easements</li> <li>• Develop an abandonment plan to include:               <ul style="list-style-type: none"> <li>- Applications and notifications.</li> <li>- Regulatory requirements.</li> <li>- Disconnection from active piping.</li> <li>- Deactivation status.</li> </ul> </li> <li>• Management of Change Review</li> <li>• Review and approval of abandonment plan by:               <ul style="list-style-type: none"> <li>- Division Manager.</li> <li>- Senior Vice President of Operations.</li> </ul> </li> <li>• Execute plan upon approval.</li> <li>• Update Inactive and Abandoned Pipeline List</li> </ul>

REQUIREMENTS FOR THE REACTIVATION OF AN INACTIVE PIPELINE
<ul style="list-style-type: none"> <li>• Division develops a reactivation plan (See Table 1, Maintenance Requirements for Inactive Pipelines, for plan development guidance).</li> <li>• Review reactivation plan by the following review team: (This review can be used as the Management of Change review)               <ul style="list-style-type: none"> <li>- Area Operations Leader</li> <li>- Reactivation plan author</li> <li>- Division PMI Execution Leader</li> <li>- Inactive and Abandoned Pipeline Coordinator</li> <li>- Others, as required.</li> <li>- Additional review members, if reactivating an Inactive non-Regulated Pipeline not maintained as an Inactive-Regulated Pipeline.                   <ul style="list-style-type: none"> <li>- PMI Execution Leader from another ONP division.</li> <li>- ONP PMI Implementation Leader</li> <li>- Others, as required.</li> </ul> </li> </ul> </li> <li>• Approval of reactivation plan by the following:               <ul style="list-style-type: none"> <li>- Division Manager</li> <li>- Vice President of ONP Operations Services</li> </ul> </li> <li>• Update Inactive and Abandoned Pipeline List</li> </ul>

## 4.2 Inactive and Abandoned Pipeline List

ONP divisions shall maintain a listing of Inactive and Abandoned Pipeline segments. The list must contain the information in Appendix A, Inactive and Abandoned Pipeline List Requirements.

Inactive Pipeline segments shall remain listed until such time that the segment is reactivated, Abandoned, or sold.

Abandoned Pipeline segments shall remain listed as long as pipe is not removed and remains in place, whether or not the right-of-way is released.

## 4.3 Pipeline Deactivation Requirements

Prior to starting deactivation activities, any applications or notifications required by regulatory agencies must be made. Note that a specific deactivation plan may be required for the application or notification.

The requirements to deactivate a Pipeline are as follows:

- Isolate piping from active piping.
- Displace the product.
- Fill the piping with an inert material.
- Maintain the segment in accordance with Table 1, Maintenance Requirements for Inactive Pipelines

These items are discussed in more detail in the following sections.

### 4.3.1 Isolate Piping

The Pipeline must be Isolated from active piping. The Pipeline is isolated when its piping is disconnected from active piping or when a skillet blind (blanking plate) is installed between the Pipeline and the active piping. Disconnected piping can be sealed off with a weld cap or blind flange.

When cathodic protection is required to be maintained on the Pipeline (see Table 1), consideration must be given to how the protection will be applied and tested. Bonds and test points must be maintained or installed to enable the determination of the effectiveness of the cathodic protection system. The Division Cathodic Protection Coordinator should be contacted for specific requirements.

A pressure relief system should be considered for isolated piping depending upon the method or location of isolation.



#### 4.3.2 Displace the Product

The product transported by the Pipeline shall be displaced using cleaning and/or displacement-type pigs. The product should be removed to reasonably minimize safety and environmental hazards in the event that the piping was to be inadvertently opened to the environment.

#### 4.3.3 Fill Piping

The Pipeline must be filled with nitrogen or other suitable inert material. A displacement-type pig shall be used during the filling process.

The inert material used to fill the Pipeline should be suitable for the intended duration of deactivation with consideration of the effects of the material on the pipe integrity and the potential consequences of a release.

A nominal amount of pressure should remain within the piping to ascertain the status of the inert material.

Displacement and filling the Pipeline can be accomplished with the same pigging operation.

#### 4.3.4 Maintenance Requirements for Inactive Pipelines

Inactive Pipelines must be maintained in accordance with Table 1, Maintenance Requirements for Inactive Pipelines. For details on a specific maintenance requirement consult the applicable Technical Guideline, the Operating and Maintenance Procedures Manual, or regulatory code.

When maintenance activities are performed on Inactive Pipelines, the records and documentation shall be completed and retained in accordance with the applicable procedures and guidelines for that specific maintenance activity.

**Note:** For Inactive, non-regulated Pipelines, special consideration should be given to the extent of maintenance management applied to the Pipeline. The scope of a reactivation plan will depend upon the level of maintenance of the Pipeline.

#### 4.4 Abandonment of Pipelines

Abandonment is the act of relinquishing rights to a Pipeline and its appurtenances and is a viable option for terminating ownership of a Pipeline. In most cases this includes releasing the right-of-way easements associated with the Pipeline. Abandonment will be treated

with the same formality as other types of divestiture and will require the appropriate corporate approval.

A Pipeline shall not be abandoned until an assessment to determine the viability of abandonment has been completed by the development and approval of an abandonment plan.

Prior to the development of an abandonment plan the division shall perform a review of the easements associated with the subject Pipeline. The easement review will result in the determination of the pipeline owner's rights and obligations in the event of a permanent cessation of service and/or Abandonment of the Pipeline.

The abandonment plan shall specify the steps to be taken by the division in preparation for abandonment. It shall address deactivation status if the Pipeline is Inactive. An active Pipeline shall be deactivated in accordance with the requirements of Section 4.3 of this Technical Guideline. The Pipeline must be disconnected from active piping. The abandonment plan shall also include, at a minimum, any applications or notifications for abandonment required by regulatory agencies and state and local requirements, including one-call requirements and any requirements or obligations determined by the easement review.

**Note:** For each abandoned onshore Pipeline facility crossing over, under, or through a commercially navigable waterway, a notification to the Office of Pipeline Safety is required in accordance with CFR 49 Part 195.59.

The abandonment plan shall be reviewed and approved by the Division Manager. If approved, the abandonment plan shall be presented to the ONP Senior Vice President of Operations for permission to implement the plan and abandon the Pipeline. The act of abandonment shall not be deemed to occur until such time as the abandonment plan is fully executed.

For the case of a replacement section of an active Pipeline where some portion or all of the replaced section would be abandoned and the pipe left in place, the project plan is equivalent to an abandonment plan. A separate abandonment plan, as described in this section, is not required. The replacement project shall address the abandonment of any pipe within the scope of the project when a separate abandonment plan is not prepared.

#### **4.5 Requirements for Reactivation of Pipelines**

An Inactive Pipeline shall not be reactivated until an assessment to determine the suitability of the intended service has been completed by the development, review, and approval of a reactivation plan.

#### 4.5.1 Reactivation Plan Development

A reactivation plan shall be developed that describes the work required to ascertain the suitability for service of the Inactive Pipeline and to meet the requirements of the ONP Technical Guidelines referenced in Section 7.0 of this Technical Guideline. The reactivation plan shall include a schedule for any surveys, inspections, and assessments, including any necessary remedial work, to be completed with reference to the anticipated commissioning date of the Pipeline.

In addition, the plan shall include any work required to meet the requirements of regulatory codes as necessary.

#### 4.5.2 Reactivation Plan Review

A review team made up of the following members shall review the reactivation plan prior to approval.

- Area Operations Leader
- Reactivation plan author
- Division PMI Execution Leader
- Inactive and Abandoned Pipeline Coordinator
- Other members as required

In the case of reactivation of an Inactive-non-regulated Pipeline that has not been maintained as an Inactive-Regulated Pipeline, the following additional members shall be included in the review of the reactivation plan.

- A division PMI Execution Leader from an another ONP division.
- ONP PMI Implementation Leader

The Inactive and Abandoned Pipeline Coordinator shall direct the notification of any division personnel whose responsibilities would be affected by the reactivation of the Pipeline. Personnel that may need notification are operation and maintenance technicians, Public Awareness Coordinators, compliance coordinators, and safety coordinators.

#### 4.5.3 Reactivation Plan Approval

The Division Manager and the Vice President of ONP Operations Services shall approve the reactivation plan prior to the commissioning of the Inactive Pipeline.

**Table 1: Maintenance Requirements for Inactive Pipelines**

Pipeline Classification	Initial Waterway Crossing Identification Survey (TG 1601.193)	3 Year Waterway Crossing Surface Evaluation (TG 1601.193)	5 Year Waterway Crossing Subsurface Evaluation-type A crossings (TG 1601.193)	3 Year Exposed Pipe Identification Survey (TG 1601.191)	3 Year Exposed Pipe Evaluation (TG 1601.191)	3 Year Right-of-Way and Marker Survey (TG 1601.192)	Right-of-Way & Marker Finding Evaluation (TG 1601.192)	Verification of Established MOP (TG 1601.190)	MOP Control Evaluation (TG 1605.212)	Pipeline Repair Review (TG 1602.198)	Initial Internal Corrosion Assessment Plan Development (TG 1603.205)	3 Year Internal Corrosion Assessment Plan Review (TG 1603.205)	Catholic Protection (in accordance with TG 1603.199 and 206)	Integrity Management Plan Requirements (PGM 1620.100 or 110) (see Appendix B)	Pipeline Assessment & Integrity Evaluation (TG 1601.197)	One-call Program - Locating	Mapping - Alignment Sheets in accordance with TG 1525.120, 130, 140	Maintain Current Maps and Records	Regulatory Periodic Maintenance and Inspection Activities (see Appendix B)	Leak Detection System Selection (TG 1604.208)	Pressure Monitoring Device Selection and Installation (TG 1605.211 and 213)	Federal and State Operating Fees and Taxes
Active	1	X	X	X	X	X	X	X	X	1	X	X	X	X	X	X	1	X	X	X	X	X
Inactive - Regulated <sup>a</sup>	-	-	X	-	X	X	X	-	-	-	-	-	X	X	-	X	-	X	X	-	-	X
Inactive - Non-regulated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X <sup>b</sup>	-	-	-	-	-	X
Considerations for reactivation plans	1	C	C	C	C	C	C	X	X	1	1	C	X	X	C	X	1	X	X	C	C	X

X - Activity required to be performed in accordance with the applicable Technical Guideline or Operating & Maintenance Procedures Manual  
 1 - Activity performed once on a Pipeline in accordance with the applicable Technical Guideline, must be scheduled if the activity has not been conducted.

C - Considering the last survey or inspection conducted, if any, the survey or inspection must be scheduled if it has not been conducted within the prescribed frequency.

<sup>a</sup> Inactive - Regulated is an Inactive Pipeline that is under the jurisdiction of the DOT or the Texas RRC or other State agency.

<sup>b</sup> State one-call regulations may require Inactive Pipelines be maintained in their mapping system and locates performed.

## 5.0 ASSESSMENT CRITERIA

Assessments of compliance with this Technical Guideline should consist of a review of the Inactive and Abandoned Pipeline Lists. The assessor should validate sufficient data to determine that the requirements of this Technical Guideline are consistently met.

## 6.0 TRAINING AND QUALIFICATION REQUIREMENTS

Technical Team members, the Management of Change Coordinators, and the PMI Execution Leaders must be familiar with the requirements of this Technical Guideline. Training is accomplished through self study and materials distribution.

Personnel must meet the applicable requirements of ONP PGM 520.181, ONP Operator Qualification Program.

## 7.0 REFERENCES AND RESOURCES

ONP Technical Guidelines referenced below have requirements that must be considered in the development of a reactivation plan as discussed in Section 4.5.

PGM 1620.100, Pipeline Integrity Management Plan for Active, Jurisdictional, Intrastate Texas Pipelines

PGM 1620.110, Pipeline Integrity Management Plan for Pipelines Subject to 49 CFR Part 195 that could affect High Consequence Areas

TG 1601.190, MOP Establishment and Pressure Testing of Pipelines

TG 1601.191, Evaluation of Exposed Underground Pipelines and Aboveground Pipelines

TG 1601.192, Right-of-Way and Pipeline Marker Evaluation

TG 1601.193, Evaluation of Pipeline Crossings Under Waterways

TG 1601.197, Pipeline Assessment and Integrity Evaluation

TG 1602.198, Pipeline Defect Evaluation and Repair

TG 1603.199, Recognizing, Testing, and Repairing Shorted Casings

TG 1603.205, Internal Corrosion Program for Pipelines

TG 1603.206, Operation of Cathodic Protection on Completed Pipelines and in Completed Facilities

TG 1604.208, Selecting Leak Detection Systems

TG 1605.211, Pressure Data Capture, Retrieval, Storage, and Utilization

TG 1605.212, Establishing Pressure Controller and Shutdown Device Set Points

TG 1605.213, Selecting and Installing Pressure Recording and Monitoring Devices

TG 1525.120, Requirements for Existing Alignment Sheets

TG 1525.130, Requirements for CAD Alignment Sheet Creation on Existing Pipelines

TG 1525.140, Requirements for LEPC Maps

Federal and industry code references with respect to the scope of this Technical Guideline.

49 CFR 195.5, 195.59, 195.402 (c)(10)

ASME B31.4, Paragraph 457.

The division Regulations Coordinator should be contacted for references to State regulations with respect to the scope of this Technical Guideline.

## 8.0 VERSION LOG

VERSION NUMBER	VERSION DATE	DESCRIPTION
Version 1	1/1/2006	First Issued Version.

## 9.0 APPENDICES

Appendix A: Inactive and Abandoned Pipeline List Requirements.

Appendix B: Regulatory Periodic Maintenance and Inspection Activities

## Appendix A: Inactive and Abandoned Pipeline List Requirements

Each division shall maintain an Inactive and Abandoned Pipeline List with the following information:

- Line name
- Segment name
- Segment index number
- Length of segment
- Pipe diameter
- Date of deactivation
- Method of Isolation
- Line fill material

## Appendix B: Regulatory Periodic Maintenance and Inspection Activities

A. Title 49 Code of Federal Regulations Part 195 requires operators of hazardous liquids Pipelines to conduct inspections, surveys, and maintenance activities periodically. A generalized list of these activities is as follows:

- Maintain signs and markers along the pipeline
- Inspection of over pressure safety devices
- Patrolling the pipeline right-of-way
- Maintain the pipeline right-of-way
- Inspection of Commercially Navigable Waterways
- Inspection, maintenance, and protection of mainline valves
- Pipeline repair and maintenance documentation
- Inspection of pipe when exposed by excavations (Bell Hole Inspection)
- Maintain current maps and records
- Inspections of cathodic protection systems
  1. Bi-monthly rectifier and critical bond report
  2. Cathodic protection test point survey
  3. Monitoring casings
  4. Maintaining test leads
- Internal corrosion control
  1. Investigate corrosive effects of the product
  2. Coupon analysis, if corrosion inhibitor is used
  3. Visual inspection of internal surfaces of pipe when sections are removed
- Liaison with fire, police, and other appropriate public officials
- Public education programs
- Damage prevention programs (includes participation in one-call systems)

B. Integrity Management Plan requirements (see PGM 1620.100 and 1620.110)

- Identification of Pipeline sections that could affect high consequence areas
- Baseline and periodic integrity testing plan
- Evaluation of emergency flow restricting device placement
- Reactivation plans
- For intrastate Pipelines in Texas, selection of the integrity management plan method, prescriptive or performance based



# Starting Up Riverview Pipeline

P-195.402(c) (7) SU

**Purpose:** To give the steps that an operator will take to ensure that the pipeline is properly started.

---

**Applies to:** Riverview Pipeline

---

**Frequency:** As needed.

---

**Safety and Environmental Precautions:**

---

**References:** O&M Manual PRC1410.100, Section 3.0, "Normal Operations"  
49 CFR 195.402(c)(7) "Starting up and shutting down a pipeline"

---

**Prerequisites:** Ensure all personnel who receive from or input into the pipeline know that the pipeline will be started.  
Ensure the block valve at the Yellowstone River is in the open position.

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**Forms:** N/A

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**Related Procedures:**

---

## Procedure Steps

**Note:** This pipeline is designed to fail safe.

**Currently, the system is operated by the Plant Operators at the plant and another Operator is at the terminal while the line is operating. Normally the line is operated 10-14 hours per day during day shift time frame.**

Review the pumping schedule with the Operator at the terminal and make plans on when to start the line and how long the system will operate each day.

1. Open valve V4 (see schematic) at the Riverview Terminal. **Terminal Operator**
2. Align valves at the Grasslands Complex to permit the flow of product from storage through the meter station to the pipeline. **Plant Operator**
3. Open valve V3 (see schematic) at the Grasslands Complex.
4. Start pumps at the Grasslands Complex to begin sending liquids through the pipeline.
5. Monitor the flow and pressure at both ends. Normal pressure runs 410-430 psi at the pump station and 125-150 psi at the terminal. Normal flow is 390 BPH with Unit # 1 and 390 BPH with Unit # 2.
6. Record the pressures and flows each hour and prepare an over and short summary over the pumping time.

# **Shutting Down Riverview Pipeline**      P-195.402(c) (7) SD

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**Purpose:**                      To give the steps to ensure that the pipeline is properly shutdown.

---

**Applies to:**                Riverview Pipeline

---

**Frequency:**                As needed for the normal operation and maintenance of the pipeline.

---

**Safety and  
Environmental  
Precautions:**

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**References:**                O&M Manual PRC1410.100, Section 3.0, "Normal Operations"  
   49 CFR 195.402(c)(7) *"Starting up and shutting down a pipeline"*

---

**Prerequisites:**            Ensure all personnel who receive from or input into the pipeline know that  
the pipeline will be shutdown.

---

**Forms:**                      N/A

---

**Related  
Procedures:**

## Procedure Steps: Emergency Shutdown

(Follow Normal Shutdown)

## Procedure Steps: Normal Shutdown

**Note:** The pipeline will still be pressurized and full of liquids after this procedure.

1. Shutdown Riverview product pumps at the Grasslands Complex. **Plant Operator**
2. Close valve V4 at the Riverview Terminal upon completion of pipeline shipment and the pipeline is shut down. **Terminal Operator**
3. Close valve V3 at the Grasslands Complex. **Plant Operator**
4. **Monitor the pressure at the plant end while down.**

## Procedure Steps: Isolate Pipeline

1. Follow Normal Shutdown Procedure.
2. If Blow down of line is required:
  - a. open vapor recovery valve V8 on launcher.
  - B. crack open valve V2 to slowly bleed pressure off pipeline.

## **Cathodic Protection Criteria and Requirements for Survey and Remedial Action Technical Guideline**

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## 1.0 SCOPE

This Technical Guideline establishes the requirements for maintaining cathodic protection on the external surface of ONP operated buried, submerged, or on-ground metallic Structures that store or transport hazardous liquids, natural gas, flammable gas, or gas that is toxic or corrosive.

Specifically this Technical Guideline establishes:

- Acceptable criteria for cathodic protection.
- The requirements for bimonthly and annual surveys of cathodic protection systems.
- The requirements for bimonthly testing of HVAC Induced-Voltage Coupons.
- The requirements for excavation inspections and follow-up evaluations.
- Related documentation requirements.
- The qualifications for company and contract personnel performing cathodic protection testing and excavation inspections.
- The requirements to perform CIS or other comparable survey.
- Cathodic protection design requirements (Appendix B).

Deviations from this Technical Guideline must be approved in accordance with ONP G010.100, Development and Use of ONP Standards, Guidelines, Technical Guidelines, and Programs.

**NOTE:** The applicable inspection requirements of this Technical Guideline are consistent with API recommended Practice 651, Cathodic Protection of Aboveground Petroleum Storage Tanks.

### 1.1 Implementation

Within one year of the commissioning of a newly constructed Structure, cathodic protection shall be energized and an annual survey, as described in section 4.4, shall be completed.

An evaluation of induced AC voltage shall be conducted under the direction of a Qualified Person within one year of:

- Determining that a new HVAC transmission line was installed within 1,000 feet of an ONP operated pipeline.
- The construction or acquisition of an ONP operated pipeline that is within 1,000 feet of an HVAC transmission line.



## 2.0 DEFINITIONS

**Carrier Pipe** – The Pipeline carrying the product being transported.

**Casing** – A steel pipe installed around a Carrier Pipe to provide external mechanical protection to the Carrier Pipe. Most casings are installed at road and railway crossings.

**CIS** – Close Interval cathodic protection Survey

**Critical Bond** – A metallic connection for the purpose of providing a low resistance path for current exchange. Removal of this bond would result in the depolarization of an ONP Structure below an approved cathodic protection criteria (includes bonds intended to provide safe current discharge from ONP Structures, direct bonds to foreign rectifiers, continuity bonds providing cathodic protection current, etc.).

**Electrolyte** – Soil or water in direct contact with the external surface of the cathodically protected Structure.

**HVAC** – High Voltage Alternating Current

**HVAC Induced-Voltage Coupons** – Coupon test stations designed for the evaluation of induced voltage due to HVAC transmission lines.

**IR Drop** – Voltage drops, other than those across the Structure-to-Electrolyte boundary.

**mV** – millivolt

**Non Critical Bond** – A bond whose removal would not result in the depolarization of an ONP Structure below approved cathodic protection criteria (includes interference bonds intended to provide safe current discharge from non-ONP facilities).

**Pipeline** – Piping between pump, booster, or valve station that extends from station outlet valve to station inlet valve.

**Qualified Person** – Individual meeting the qualification requirements established in section 6.0.

**Shall, Must, Will** – Mandatory requirements.

**Should** – A highly preferred or recommended action or methodology.

**Structure** – Any buried, submerged, or on-ground steel structure that stores or transports hazardous liquid. Examples of Structures are Pipelines, tanks, headers, drain lines, and sumps.

**Subject Matter Team** – Refers to the Cathodic Protection Subject Matter Team.

### 3.0 RESPONSIBILITIES

#### 3.1 Personnel Collecting Data, Performing Testing, and Performing Inspections

Perform and document testing and inspections in accordance with this Technical Guideline.

#### 3.2 Cathodic Protection Coordinator

- Cathodic Protection Coordinators are responsible for their Division's implementation and compliance with this Technical Guideline.
- Each Division's representative on the Subject Matter Team will serve as that Division's Cathodic Protection Coordinator.
- The Cathodic Protection Coordinator is responsible for the selection of qualified contractors and ONP personnel to perform testing, inspection, data evaluation, and remedial action in accordance with this Technical Guideline and ONP PGM520.181, Operator Qualification.

#### 3.3 Subject Matter Team

The Subject Matter Team is responsible for:

- Maintaining this Technical Guideline and reviewing deviation requests as necessary.
- Establishing the training requirements outlined in section 6.0 of this document.

### 4.0 PROCEDURES AND KEY ELEMENTS

#### 4.1 Cathodic Protection Criteria

ONP operated Structures shall meet one of the following three cathodic protection criteria:

- Negative 850 mV ON with IR Drop Considered.
- Negative 850 mV Instant Off.
- 100 mV Shift.

**NOTE:** ONP criteria for cathodic protection refer to Structure-to-Electrolyte DC voltage measurements relative to a standard copper/copper sulfate reference cell. When other standard reference electrodes are used, voltage conversion to copper/copper sulfate reference equivalent is required.

**NOTE:** Any of these criteria can be applied to any test point at any time. Survey documentation or subsequent remedial action, must indicate that one of these criteria is met.

**NOTE:** Cathodic Protection current will be controlled so as not to damage the protective coating or the pipe.

#### 4.1.1 Negative 850mV ON with IR Drop Considered

Refers to a negative potential of at least 850mV with the cathodic protection applied. IR Drop must be considered. Consideration is the application of sound practice by a Qualified Person in determining the significance of voltage drops by methods such as:

- Measuring or calculating the voltage drop(s).
- Reviewing the historical performance of the cathodic protection system.
- Determining whether or not there is physical evidence of corrosion. An in-line inspection tool survey can indicate evidence of corrosion in a Pipeline and the success of a cathodic protection system.

#### 4.1.2 Negative 850 mV Instant Off

Refers to a negative potential of at least 850mV without the application of cathodic protection current.

Care must be taken to record the potential before significant depolarization occurs. It is important that current sources affecting the survey area are interrupted for this measurement.

#### 4.1.3 100 mV Shift

This criterion requires two voltage measurements. One measurement is the "Instant Off" potential described in section 4.1.2 above. The other measurement is the depolarized potential taken after the cathodic protection current sources have been de-energized and the Structure allowed sufficient time to depolarize. The difference between both measurements is the cathodic polarization. This difference must be at least 100mV.

**NOTE:** The formation or decay of polarization can be measured to satisfy this criterion; that is, the voltage measurements may be performed in either order.

#### 4.2 General Process Overview

Electrical measurements and inspections shall be performed to determine if cathodic protection systems are functioning properly and if Structures are meeting approved criteria for cathodic protection. Appendix A contains a high-level process diagram.

ONP cathodic protection systems shall be regularly monitored by:

- Bimonthly Testing
- Annual Testing
- Excavation Inspections

Table 1 summarizes the requirements for testing, inspection, data evaluation, and remedial action.

**Table 1 – Testing and Evaluation Frequency Requirements**

Name of Test or Inspection	Activity	Frequency
Bimonthly Testing	<ul style="list-style-type: none"> <li>• Read rectifiers.</li> <li>• Read Critical Bonds.</li> <li>• Read HVAC Test Stations.</li> </ul>	Six times each calendar year at intervals not exceeding 2 ½ months.
Annual Testing	<ul style="list-style-type: none"> <li>• Read rectifiers and Bonds.</li> <li>• Structure-to-Electrolyte potential measurements.</li> <li>• Casing and electrical isolation tests.</li> </ul>	Once each calendar year at intervals not exceeding 15 months.
Excavation Inspection	<ul style="list-style-type: none"> <li>• Evaluate coating condition.</li> <li>• Inspect for evidence of corrosion.</li> <li>• Pipeline-to-soil potential measurements.</li> </ul>	Whenever underground Pipelines are exposed to facilitate inspection activities.
Data Evaluation	<ul style="list-style-type: none"> <li>• Evaluation of testing and inspection data.</li> </ul>	Upon completion of testing or inspection.
Remedial Action	<ul style="list-style-type: none"> <li>• Remedial action, as needed.</li> </ul>	As needed. Time frames in accordance with Table 2.

**NOTE:** The reference electrode shall be connected to the negative lead and the Structure or test lead shall be connected to the positive lead. With this configuration, proper cathodic protection voltages shall be indicated as negative on a digital voltmeter.

**NOTE:** The use of current carrying lead wires for Structure-to-Electrolyte measurements is not recommended.

### 4.3 Bimonthly Testing

Bimonthly testing shall include rectifier and Critical Bond testing and must be performed six times each calendar year at intervals not exceeding 2½ months.

#### 4.3.1 Rectifier Testing

Rectifier testing shall be documented. Individual tests can be documented on: ONP0054, Cathodic Protection Rectifier Report Form; MAXIMO® form integrated into the MAXIMO® job plan function; or in the form of a survey log

Minimum requirements for bimonthly rectifier testing and documentation are:

- Unique rectifier identification.
- DC current and voltage output for impressed current sources.
- Current magnitude of multiple negative cables.
- Test location and date.
- Tester's name.

#### 4.3.2 Critical Bond Testing

Bimonthly Critical Bond testing shall be documented. Individual tests can be documented on: ONP0053, Cathodic Protection Bond Report Form; MAXIMO® form integrated into the MAXIMO® job plan function; or in the form of a survey log.

Minimum requirements for bimonthly Critical Bond testing and documentation are:

- Current magnitude and direction of flow.
- Structure-to-Electrolyte readings on both sides of the bond, if deemed practical by the Cathodic Protection Coordinator.
- Test location and date.
- Tester's name.

**NOTE:** Diodes and reverse current switches, if used are considered part of the bond.

#### 4.3.3 HVAC Induced-Voltage Coupon Monitoring

Bimonthly testing shall be documented using a MAXIMO<sup>®</sup> form integrated into the MAXIMO<sup>®</sup> job plan function, or in the form of a survey log.

The requirements for bimonthly HVAC coupon testing are:

- DC and AC pipe-to-soil potential at the pipe level, if equipped with a permanent reference electrode, otherwise at grade
- Instant off polarized potential of the cathodic protection coupon
- DC and AC current of the cathodic protection coupon
- Test location and date of measurement
- Tester's name

In addition, consider collecting the time and ambient temperature at time of reading (optional data).

#### 4.4 Annual Testing Requirements

Perform the following tests and inspections annually:

- Measure Structure-to-Electrolyte potentials.
- Test Casings for electrical isolation.
- Test electrical isolation devices.
- Measure and inspect bonds.
- Measure and inspect cathodic protection sources (impressed and, if deemed practical by a Qualified Person, galvanic).

Annual testing must be performed once each calendar year, at intervals not exceeding 15 months.

Annual testing shall be documented. Annual testing documentation shall include:

- Location and date of each measurement and the tester's name.
- Structure-to-Electrolyte measurements.
- Results of electrical isolation tests using isolation test meters, if applicable.
- Current magnitude and direction of flow for bonds.
- "As left" DC current and voltage output for impressed current sources.
- "As left" DC current return on each impressed current negative cable, where multiple negative cables exist.

- “As left” tap settings.
- Document adjustments made to include “as found” measurements, and document “as found” DC current and voltage output, DC current return, and tap settings, as appropriate.
- Relevant comments and observations.

#### 4.4.1 Structure-to-Electrolyte Potentials

- For cathodically protected Structures, measure Structure-to-Electrolyte potentials.
- On Pipelines, placement of portable reference electrodes shall be directly over the pipe being surveyed.
- When Pipelines are in close proximity to HVAC transmission lines, a Pipeline-to-Electrolyte AC voltage measurement shall be obtained.

**CAUTION:** Contact the division Cathodic Protection Coordinator if the AC voltage measurement is greater than 10 volts.

- On tank structures, multiple readings around the tank are required as determined by a Qualified Person.
- Measure potentials at test stations and other selected areas. Sufficient test points should be established by a Qualified Person to provide an evaluation of the cathodic protection system's ability to meet the acceptable criteria.

#### 4.4.2 Casing Electrical Isolation

- Test Casing for electrical isolation. A metallic short between a Casing and Carrier Pipe can result in inadequate cathodic protection of the Carrier Pipe.
- Measure the Structure-to-Electrolyte potential of both the Carrier Pipe and Casing. Placement of the reference electrode shall be directly over the Carrier Pipe beyond the end of the Casing and no closer than 3 feet from the Casing vent. The reference electrode shall remain at the same location for both measurements.
- If the difference between the Casing and Carrier Pipe measurements differ by 100mV or less, a metallic short is possible. Refer to ONP TG1603.199, Shorted Casing Evaluation and Repair Technical Guideline for further testing requirements.

#### 4.4.3 Electrical Isolating Devices

- Test electrical isolating devices (insulating flanges, insulating unions, etc.) for electrical isolation.
- Measure the Structure-to-Electrolyte potential on both sides of the isolating device. Placement of the reference electrode shall be directly over the underground piping. The reference electrode shall remain at the same location for both measurements.
- Electrical isolation may be determined by comparing the potential measurements on each side of the device or, for above ground isolation devices, by using a Gas Electronics 601 meter or equivalent.
- If the Structure-to-Electrolyte potential method is used, a voltage difference of less than 100 mV may indicate ineffective isolation and further testing is required. Consider tests similar to those performed on Casings (refer to ONP TG1603.199, Shorted Casing Evaluation and Repair Technical Guideline).

#### 4.4.4 Critical and Non-Critical Bonds

- Measure bond current.
- Determine direction of bond current flow.
- Measure Structure-to-Electrolyte potential of both sides of the bond, if determined practical by a Qualified Person. The reference electrode shall remain at the same location for both measurements.

**NOTE:** Diodes and reverse current switches, if used are considered part of the bond.

#### 4.4.5 Rectifiers

- Measure the DC voltage output.
- Measure the DC current output.
- Measure DC current magnitude on multiple negative cables.
- Visually check all rectifiers for damage to the case, wiring, or screens.
- Clean all vents and visually check all components for signs of heat or wear.
- Check all connections for tightness and all wiring for proper insulation.



## 4.5 Excavation Inspection and Follow up Evaluation Requirements

### 4.5.1 Excavation Inspection Requirements

When sections of underground Pipeline are exposed to facilitate safe access for inspection:

- The coating shall be evaluated.
- If the coating is disbonded or damaged, the Pipeline section shall be inspected for evidence of external corrosion.
- Pipeline-to-soil potential measurements near the underground Pipeline.

**NOTE:** If an underground Pipeline is exposed and can be observed visually, but the excavation does not permit safe entry, Pipeline-to-soil potential measurements are not required.

**NOTE:** Pipeline-to-soil potential measurements are not required if the coating is not damaged or removed.

**NOTE:** If a defect is identified, an evaluation must be performed in accordance with ONP TG1602.198, Pipeline Defect Evaluation and Repair Technical Guideline.

When a section of Pipeline is removed, the internal surface shall be inspected for evidence of internal corrosion.

Excavation inspections shall be documented in the Excavation Inspection section of ONP0051, Inspection and Investigation Report Form, or the Excavation Inspection & General Information section of ONP0026, Pipeline Defect Evaluation & Repair Form.

### 4.5.2 Follow-up Evaluation

If corrosion, disbonded coating, positive Structure-to-Electrolyte readings, or Structure-to-Electrolyte readings less negative than  $-850\text{mV}$  are identified, documentation of the investigation shall be reviewed by the Cathodic Protection Coordinator or an individual designated by the Cathodic Protection Coordinator.

**NOTE:** If a defect is identified, an evaluation must be performed in accordance with ONP TG1602.198, Pipeline Defect Evaluation & Repair Technical Guideline.

The Cathodic Protection Coordinator or an individual designated by the Cathodic Protection Coordinator shall direct a follow up evaluation to determine if any follow up evaluation is required.

Field notes, notes on the Inspection and Investigation Form, survey data and reports, written summaries, etc., shall document this evaluation.

**NOTE:** Depending on available information and the type of evaluation that is appropriate, follow up evaluations may or may not be field investigations.

## **4.6 Data Evaluation and Close Interval Survey Requirements**

### **4.6.1 Bimonthly Testing**

#### **4.6.1.1 Rectifiers and Critical Bonds**

An individual that meets the requirements of subsection 6.2 shall review the data. If an individual that meets the requirements of subsection 6.2 collects the data, review is not required. The reviewer or data collector shall initiate appropriate remedial action in accordance with section 4.7.

#### **4.6.1.2 HVAC Induced-Voltage Coupons**

A Qualified Person will review HVAC Induced-Voltage Coupon data.

### **4.6.2 Annual Testing**

A Qualified Person will develop, direct the development of, or approve a plan to perform remedial action in accordance with section 4.7.

### **4.6.3 Excavation Inspections and Follow-up Evaluations**

The results of excavation inspections that identify corrosion, disbonded coating, positive Structure-to-Electrolyte readings, or Structure-to-Electrolyte readings less negative than  $-850\text{mV}$ , and corresponding follow-up evaluations shall be reviewed by an individual that meets the requirements of subsection 6.2. If an individual that meets the requirements of subsection 6.2 collects the data, review is not required. The reviewer shall initiate appropriate remedial action in accordance with section 4.7.

### **4.6.4 Requirements to Perform CIS or Other Comparable Survey**

CIS or other comparable survey is required when:

- Confirmed external corrosion at a foreign pipeline crossing.
- A Qualified Person, Cathodic Protection Coordinator, or their designee identifies unexplained potentials that may indicate interference.
- The Division PMI Execution Leader, in accordance with ONP TG1601.197, Pipeline Assessment and Integrity Evaluation, determines they are the best method(s) to assess the effectiveness of the cathodic protection system; provide baseline operating data; locate areas of inadequate protection levels; identify locations that may be adversely affected by construction, stray currents, or other unusual environmental conditions; or monitor periodically.
- A Qualified Person determines they are the best method(s) to assess the effectiveness of the cathodic protection system; provide baseline operating data; locate areas of inadequate protection levels; identify locations that may be adversely affected by construction, stray currents, or other unusual environmental conditions; or monitor periodically.

**NOTE:** If an interrupted CIS is performed on one continuous mile or more of ONP Operated hazardous liquid pipelines, TG1603.195, Interrupted Close Interval Survey will apply. If less than one mile or an "ON" is performed, the process will be approved by a Qualified Person.

#### 4.7 Remedial Action Requirements

Remedial action shall be performed within the timeframes outlined in Table 2.

**Table 2 – Required Time Frames for Deficiency Correction**

Deficiency Type	Time Frames Starts	Time Frame (Months)
Faulty rectifier	Date of deficient reading.	1.5
Faulty Critical Bonds	Date of deficient reading.	1.5
DC Interference remediation	Date of deficient reading.	6
Not meeting criteria (includes ground bed replacement/installation)	Date of deficient reading.	6
Shorted Casing	Date of determination of less than 100mV between Casing and Carrier Pipe.	12
Other	Date deficiency is identified.	Determined by Cathodic

		Protection Coordinator, but not to exceed 12 months.
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The Cathodic Protection Coordinator must oversee or direct the oversight of implementation and completion of remedial action and remedial action plans described in section 4.6.

Remedial action frequently includes further testing. Once testing is complete, the following remedial actions are typical:

- Repair, replace, or adjust the components of the cathodic protection system.
- Provide supplemental cathodic protection facilities where additional protection is necessary.
- Repair or recondition coatings.
- Repair, replace, or adjust continuity or interference bonds.
- Remove unintentional metallic contacts.
- Repair defective electrical isolating devices.
- Interference mitigation.

The documentation of completed remedial action and corresponding results associated bimonthly testing and excavation inspection shall be reviewed and approved by the Cathodic Protection Coordinator or an individual designated by the Cathodic Protection Coordinator.

The documentation of completed remedial action and corresponding results associated with annual testing shall be reviewed and approved by or under the direction of a Qualified Person.

## 4.8 Documentation Requirements

### 4.8.1 Bimonthly Testing

Bimonthly testing shall be documented on: ONP0054, Cathodic Protection Rectifier Report Form and ONP0053, Cathodic Protection Bond Test Form; MAXIMO<sup>®</sup> forms integrated into the MAXIMO<sup>®</sup> job plan function; or in the form of a survey log

Rectifier testing documentation shall include:

- Unique rectifier identification
- DC current and voltage output for impressed current sources.
- Current magnitude of multiple negative cables.
- Test location and date.
- Tester's name.

Bond testing documentation shall include:

- Current magnitude and direction of flow.
- Structure-to-Electrolyte readings on both sides of the bond, if deemed practical by the Cathodic Protection Coordinator.
- Test location and date.
- Tester's name.

Reviews of bimonthly testing can be documented in various ways to include completed work orders or the reviewer's dated signature or initials on test forms.

### 4.8.2 Annual Testing

Annual testing will be documented in the form of a final report or reports that include the data required in section 4.4.

### 4.8.3 Excavation Inspection and Follow up Evaluations

Excavation inspections shall be documented in the Excavation Inspection section of ONP0051, Inspection and Investigation Report Form, or the Excavation Inspection & General Information section of ONP0026, Pipeline Defect Evaluation & Repair Form.

Follow-up evaluations will be documented by:

- Field notes
- Notes on the Inspection and Investigation Forms
- Survey data and reports
- Written summaries, etc.

#### **4.8.4 Remedial Action Plan for Annual Testing**

Remedial action plans shall be documented in the form of a report, outline, or activity list.

#### **4.8.5 Remedial Action**

Remedial action will be documented with project-related documents such as field notes, survey reports, work orders, drawings, calculations, photographs, contracts, etc.

Reviews of annual testing can be documented in various ways to include completed work orders or the reviewer's dated signature or initials on test forms.

### **5.0 ASSESSMENT CRITERIA**

Internal assessment checklists and protocols will be developed under the direction of the Technical Team with input from the ONP Internal Assessment Coordinator.

### **6.0 TRAINING AND QUALIFICATION REQUIREMENTS**

#### **6.1 Personnel Performing Bimonthly Testing**

Personnel performing bi-monthly testing must complete Classroom Training on section 4.3 of this Technical Guideline and the corresponding documentation requirements. Personnel that meet the requirements of section 6.2 may perform bimonthly testing.

#### **6.2 Personnel Performing Annual Testing**

Personnel performing annual testing shall be certified by NACE International<sup>1</sup>. Individuals participating in the NACE International General Certification Program shall be certified as a NACE Technologist or higher. Individuals participating in the NACE Cathodic Protection Certification Program shall be certified as a Level 1 Cathodic Protection Tester or higher.

Personnel must complete Orientation Training on section 4.4 and related documentation requirements.

### 6.3 Personnel Performing Excavation Inspections

Personnel performing excavation inspections must complete Orientation Training on section 4.5 of this Technical Guideline and the corresponding documentation requirements.

### 6.4 Cathodic Protection Coordinator

CP Coordinators shall be certified by NACE International. Individuals participating in the NACE International General Certification Program shall be certified as a NACE Senior Technologist or higher. Individuals participating in the NACE Cathodic Protection Certification Program shall be certified as a Level 2 Cathodic Protection Tester or higher. Individuals must also complete Orientation Training on this Technical Guideline at intervals not to exceed 15 months.

### 6.5 Qualified Person

Individuals performing the role of Qualified Person must be recognized by NACE as a Corrosion Specialist or Cathodic Protection Specialist.<sup>1</sup>

### 6.6 Operator Qualification Requirements

Personnel must meet applicable requirements of ONP PGM520.181, Operator Qualification.

## 7.0 REFERENCES AND RESOURCES

- Professional Certification Program of NACE International
- NACE International Standard RP0169-96, Control of External Corrosion on Underground or Submerged Metallic Piping Systems
- 49 CFR 195.414 and 195.416
- ONP TG1603.199, Shorted Casing Evaluation and Repair
- ONP TG1602.198, Pipeline Defect Evaluation and Repair
- ONP G010.100, Development and Use of ONP Standards, Guidelines, Technical Guidelines, and Programs
- ONP PGM520.180, Training
- ONP PGM520.181, Operator Qualification
- ONP0026 – Pipeline Defect Evaluation & Repair Form
- ONP0051 – Inspection & Inspection Report Form
- ONP0053 – Cathodic Protection Bond Report Form
- ONP0054 – Cathodic Protection Rectifier Report Form

## 8.0 VERSION LOG

Version Number	Version Date	Effective Date	Description
1.0	1/1/2006	1/1/2006	First Issued Version.

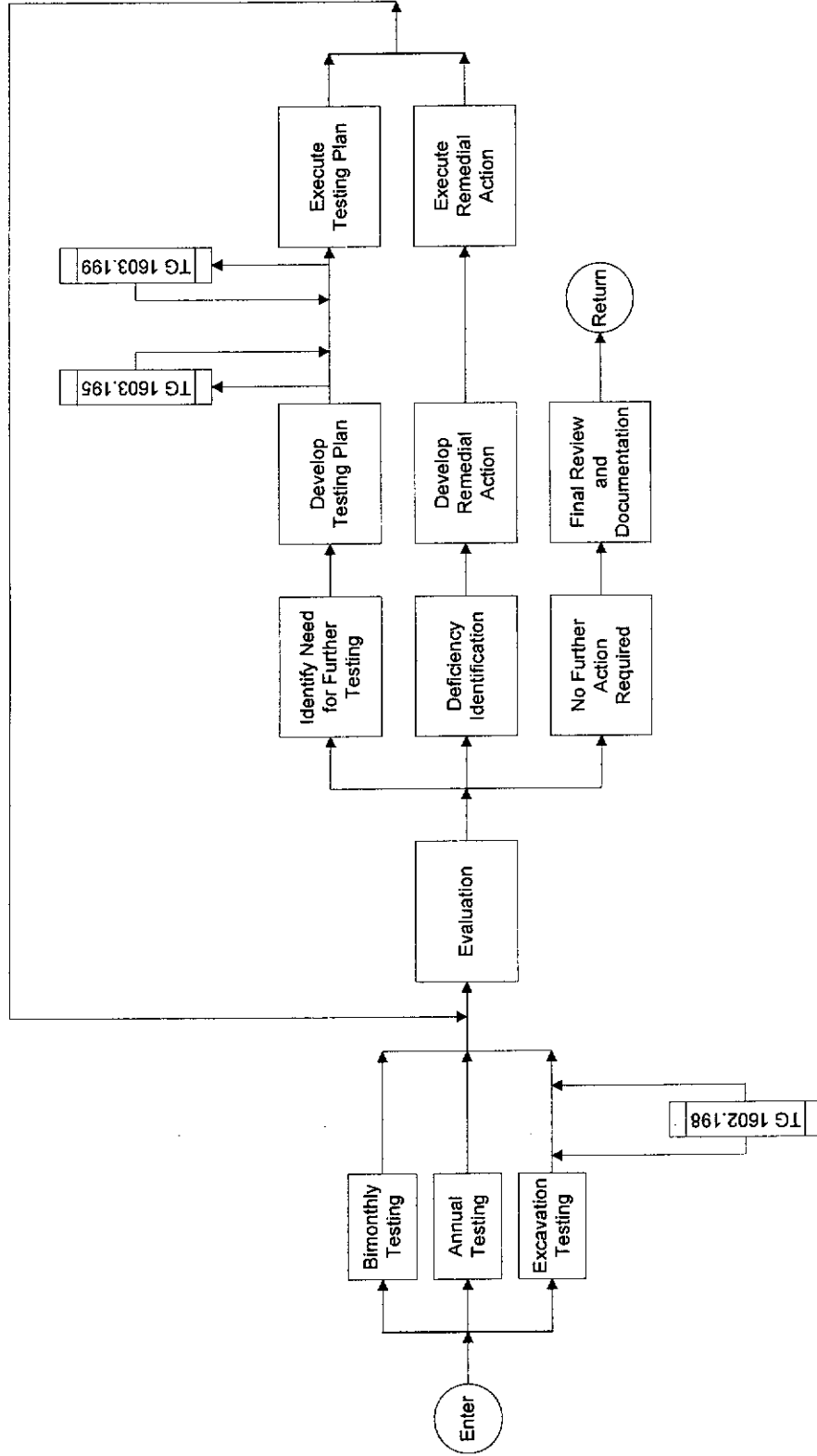
## 9.0 APPENDICES

Appendix A – Cathodic Protection Testing & Evaluation Process

Appendix B – Cathodic Protection Design & Installation Requirements



**APPENDIX A – CATHODIC PROTECTION TESTING & EVALUATION PROCESS**



## APPENDIX B – CATHODIC PROTECTION DESIGN AND INSTALLATION REQUIREMENTS

### 1.0 GENERAL

The Cathodic Protection Coordinator working with a Qualified Person is responsible for meeting the requirements of this appendix.

#### 1.1 Design Requirements

The design of new cathodic protection systems shall be reviewed and approved by a Qualified Person.

**NOTE:** This requirement does not apply to ground bed replacements.

**NOTE:** If metallic materials other than steel are used, specific design requirements will be established.

##### 1.1.1. External Coating

The coating material must be designed to mitigate corrosion of the buried or submerged pipeline and have sufficient adhesion to the metal surface to prevent under film migration of moisture. The coating must be sufficiently ductile to resist cracking and enough strength to resist handling damage and soil stress. Coating must be compatible with cathodic protection.

If the coating is an insulating type, it must have low moisture absorption and provide high electrical resistance.

Coating specifications will include appropriate surface preparation requirements.

**NOTE:** This external coating requirement does not apply to lowered pipe.

##### 1.1.2. Test Leads

Except for offshore pipelines, each buried or submerged pipeline or segments of pipeline under cathodic protection required by this subpart must have electrical test leads for external corrosion control.

Test leads will be located at intervals frequent enough to appropriately evaluate the adequacy of cathodic protection as determined by a Qualified Person.

##### 1.1.3. Electrical Isolation

If underground structures requiring cathodic protection are to be protected independently from other metallic structures they are in electrical contact with, they shall be electrically isolated from the other structure. Otherwise they will be protected as a single unit.

**CAUTION:** Insulating devices will be installed where electrical isolation is necessary to facilitate the application of corrosion control. Precautions to prevent arcing must be taken when insulating devices are installed in areas where a combustible atmosphere is reasonable to foresee.

#### **1.1.4. Fault Currents & Lightning**

Pipelines in close proximity to electrical transmission tower footings, ground cables, other grounding systems, or in other areas where it is reasonable to foresee fault currents or an unusual risk of lightning, the pipeline must be protected against damage from fault currents or lightning. Protective measures should also be taken at insulating devices.

#### **1.1.5 Interference Considerations**

Cathodic protection systems must be designed and installed to minimize any adverse effects on existing adjacent metallic structures.

#### **1.1.6. Breakout Tanks**

Cathodic protection to protect the bottom of aboveground breakout tanks must be designed in accordance with API Recommended Practice 651.

## **2.0 INSTALLATION REQUIREMENTS**

### **2.1. Coating Inspection and Protection**

The coating on buried or submerged pipeline will be inspected just prior to lowering. Coating damage must be repaired with a compatible coating system prior to backfill or submersion.

Each external protective coating must be protected from damage resulting from adverse ditch condition or damage from supporting blocks.

If coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation.

### **2.2 Test Leads**

Test leads must be connected to the pipeline so as to remain mechanically secured and electrically conductive. Test leads must be installed with enough slack so backfill will not unduly stress or break the lead. Leads installed in conduits must be electrically insulated from the conduit.

Lead attachment must not cause stress concentrations on the pipe. Connections to the pipeline must be coated with an electrical insulating material compatible with the pipeline coating and insulation on the wire.