Barrow Utilities and Electric Cooperative, Inc.

P.O. Box 449
Barrow, Alaska 99723
Phone 907-852-6166
Fax 907-852-6372

January 9, 2012

Mr. Dennis Hinnah
Deputy Director, Western Region
Pipeline and Hazardous Materials Safety Administration
12300 W. Dakota Ave., Suite 110
Lakewood, CO 80228

Re: Notice of Amendment (CPF 5-2011-0020M)

Dear Mr. Hinnah,

This correspondence relates to the CPF-5-2011-0020M, Notice of Amendment (NOA) dated October 25, 2011, resulting from a Pipeline and Hazardous Materials Safety Administration (PHMSA) inspection of Barrow Utilities and Electric Cooperative, Inc's (BUECI's) procedure and records for the Distribution Integrity Management Program (DIMP) in Barrow, Alaska.

BUECI has amended its plan to address the issues identified in the NOA Letter. Please find attached the amended written procedures and processes identified in your letter as requiring attention. The changes are shown and discussed with reference to the applicable issue number and the appropriate supporting exhibits.

BUECI hereby formally reaffirms its desire to fully cooperate with PHMSA on all matters of regulatory compliance. BUECI is committed to safe and reliable operations with protective regard to public, environment, and to its employees.

Please contact me (907-852-6166) with any comments or questions.

Sincerely,
Barrow Utilities and Electric Cooperative, Inc.

Allen Nesteby, Operations Superintendent

Attachments

cc: Ben Frantz

1) **Issue 1 §192.1007 What are the required elements of an integrity management plan? A written integrity management plan must contain procedures for developing and implementing the following elements:**

BUECI must adapt SHRIMP with the basic materials and procedures of operator specific information and procedures such as BUECI's O&M Manual and incorporate them into the DIMP.

BUECI Response to Issue #1

BUECI added references to Chapters 4.2.1, 4.2.2, 4.2.3, 4.2.4. 4.2.5, 4.2.7, and 6.1 to the Operations, Maintenance, and Emergencies (OM&E) activities that reduce the likelihood of existence of the threat to BUECI assets

Please see the following exhibits:

- Exhibit 1: Chapter 4.2.1. Corrosion through Chapter 4.2.5. Materials, Welds and Joints
- Exhibit 2: Chapter 4.2.7. Other outside forces
- Exhibit 3: Chapter 6.1. Mandatory Additional Actions

2) **Issue 2 §192.1007 What are the required elements of an integrity management plan? A written integrity management plan must contain procedures for developing and implementing the following elements:**

(a) Knowledge. An operator must demonstrate an understanding of its gas distribution system developed from reasonably available information. (1) Identify the characteristics of the pipeline's design and operations and the environmental factors that are necessary to assess the applicable threats and risks to its gas distribution pipeline. (2) Consider the information gained from past design, operations, and maintenance. (3) Identify additional information needed and provide a plan for gaining that information over time through normal activities conducted on the pipeline (for example, design, construction, operations or maintenance activities). (4) Develop and implement a process by which the 1M program will be reviewed periodically and refined and improved as needed. (5) Provide for the capture and retention of data on any new pipeline installed. The data must include, at a minimum, the location where the new pipeline is installed and the material of which it is constructed.

A. BUECI must add detail to the procedure describing the methods and data sources, used to gather information and knowledge of the system, from reasonably available sources of information (e.g., subject matter experts consulted; OM&I forms, records, system maps).

B. BUECI must add detail to the procedure(s) describing the methods used for identifying, listing, and collecting (as appropriate) additional data and information that is needed to fill gaps in knowledge and information due to missing, inaccurate, or incomplete records.

BUECI Response to Issue #2

For Issue 2A, BUECI added a table in Chapter 3 of records used by the Operation Superintendent in identifying threats and assessing the risk. The table also provides the cited sections of the OM&E Manual.

For Issue 2B, BUECI updated Chapter 4.1 to state that the Operations Superintendent and the Operations Assistant (or designees) gather and review the data sources and apply Subject Matter Expert (SME) understanding to determine the existence of threats to BUECI assets.

Please see the following exhibits:

- Exhibit 4: Chapter 3. Knowledge of the Distribution System
- Exhibit 5: 4.1. Overview

3) **Issue 3 §192.1007 What are the required elements of an integrity management plan? A written integrity management plan must contain procedures for developing and implementing the following elements:**

(b) Identify threats. The operator must consider the following categories of threats to each gas distribution pipeline: Corrosion, natural forces, excavation damage, other outside force damage, material, weld or joint failure (including compression coupling), equipment failure, incorrect operation, and other concerns that could threaten the integrity of its pipeline. An operator must consider reasonably available information to identify existing and potential threats. Sources of data may include, but are not limited to, incident and leak history, corrosion control records, continuing surveillance records, pa-trolling records, maintenance history, and excavation damage experience.

BUECI must add detail to the procedure, used to identify existing and potential threats that describe how subject matter expert(s) gathered and input information into the SHRIMP application for the threat assessment.

The procedure must detail how BUECI considers all available information for the threat assessment including all leak data, corrosion control inspection, and other inspection and maintenance documentation.

BUECI Response to Issue #3

In Chapter 4.1, BUECI added that the Operation Superintendent (or designee) reviews the SHRIMP™ interview questions and decides on any additional information to be entered into SHRIMP™.

Please see the following exhibits:

Exhibit 5: 4.1. Overview

4) **Issue 4 §192.1007 What are the required elements of an integrity management plan? A written integrity management plan must contain procedures for developing and implementing the following elements: (c) Evaluate and rank risk. An operator must evaluate the risks associated with its distribution pipeline. In this evaluation, the operator must determine the relative importance of each threat and estimate and rank the risks posed to its pipeline. This evaluation must consider each applicable current and potential threat, the likelihood of failure associated with each threat, and the potential consequences of such a failure. An operator may subdivide its pipeline into regions with similar characteristics (e.g., contiguous areas within a distribution pipeline consisting of mains, services and other appurtenances; areas with common materials or environmental factors), and for which similar actions likely would be effective in reducing risk.**

A. BUECI must add details to their DIMP to include user validation of the risk ranking results from the SHRIMP application.

B. BUECI must enhance their DIMP by providing detailed justification for not considering subdividing their system into 2 regions (steel and plastic).

Pipelines with similar characteristics that subdivide are likely to be effective in reducing risk in order to more accurately address integrity management issues. DIMP must be detailed to show the justification that risk is reduced and integrity management issues are addressed accurately without subdividing its pipeline into 2 regions.

BUECI Response to Issue #4

For Issue 4A, BUECI added a step to Chapters 4.1 and 5.1 that described that the Operation Superintendent and General Manager (or designees) review the SHRIMP™ output for determination of threat existence and for evaluation and ranking of risk to ensure that it conforms to SME understanding of the distribution system.

For Issue 4B, BUECI updated Chapter 5.1 to with a paragraph that describes the BUECI's distribution system as high density polyethylene (HDPE), except under roadways and under the airport. Because of this unusual configuration, BUECI determined that a system-wide application of threats models its distribution system better than a model using material-based subdivision into risk groups

Please see the following exhibits:

Exhibit 5: 4.1. Overview

Exhibit 6: 5.1. Overview

5) **Issue 5 §192.1007 What are the required elements of an integrity management plan? A written integrity management plan must contain procedures for developing and implementing the following elements: (e) Measure performance, monitor results, and evaluate effectiveness. (i) Number of hazardous leaks either eliminated or repaired as required by §192:703(c) of this subchapter (or total number of leaks if all leaks are repaired when found), categorized by cause; (ii) Number of excavation damages; (iii) Number of excavation tickets (receipt of information by the underground facility operator from the notification center); (iv) Total number of leaks either eliminated or repaired, categorized by cause; (v) Number of hazardous leaks either eliminated or repaired as required by §192.703(c) (or total number of leaks if all leaks are repaired when found), categorized by material; and (vi) Any additional measures the operator determines are needed to evaluate the effectiveness of the operator's 1M program in controlling each identified threat. (in its entirety)**

A. BUECI must modify their DIMP to include procedures for establishing baselines for performance measures from which to monitor effectiveness of its DIMP.

B. BUECI must modify their DIMP to include requirements for monitoring the performance measure described in §192.1 007(e)(I)(v) as "Number of hazardous leaks either eliminated or repaired as required by §192. 703(c) (or total number of leaks if all leaks are repaired when found), categorized by material".

BUECI Response to Issue #5

For Issue 5A, BUECI updated Chapter 7.1 and Chapter 7.2 to address that the Operation Superintendent (or) designee annually calculates 5-year medians of each measure to establish performance baselines.

For Issue 5B, BUECI changed Chapter 7.1 to read, "Number of hazardous leaks either eliminated or repaired as required by §192.703 (or total number of leaks if all leaks are repaired when found), categorized by material."

Please see the following exhibits:

Exhibit 7: Chapter 7.1: Mandatory Performance Measures through Chapter 7.2: Risk Based Performance Measures

6) **Issue 6 §192.1007 What are the required elements of an integrity management plan? A written integrity management plan must contain procedures for developing and implementing the following elements: (1) Periodic Evaluation and Improvement. An operator must re-evaluate threats and risks on its entire pipe-line and consider the relevance of threats in one location to other areas. Each operator must determine the appropriate period for conducting complete program evaluations based on the complexity of its system and changes in factors affecting the risk of failure. An operator must conduct a complete program re-evaluation at least every five years. The operator must consider the results of the performance monitoring in these evaluations.**

BUECI must describe in their DIMP details of how BUECI will conduct a periodic evaluation.

BUECI Response to Issue #6

In DIMP Chapter 8, BUECI revised the section to address the periodic evaluation process where the Operation Superintendent, Operation Assistant, and General Manager (or designees) meet to cover the following agenda items:

- Review performance measure trends against baselines.
- Re-evaluate preventive actions where a measure exceeds the baseline.
- Discuss whether the latest evaluation of threats and risk reflects the current status of the distribution system.
- Agree on data for updating SHRIMP™ and assign someone to do the update.

Please see the following exhibits:

Exhibit 8: Chapter 8. Periodic Evaluation and Improvement

7) **Issue 7 §192.1011 What records must an operator keep? An operator must maintain records demonstrating compliance with the requirements of this subpart for at least 10 years. The records must include copies of superseded integrity management plans developed under this subpart.**

A. BUECI must include a procedure in its DIMP with the requirement of 10 year retention of certain documents, that are used to demonstrate compliance with 192 Subpart P, such as BUECI OM&I forms. BUECI must show where compliance with 192, subpart P, exists in its procedures that requires certain documentation be retained for 10 years. BUECI documents the various forms and documentation used in the threat identification section, but does not show where such documentation must be retained for 10 years in accordance with this subpart of the code.

B. BUECI must modify their DIMP to include a revision log for its DIMP that identifies when significant changes were made and the date of the implementation of a revised DIMP. A "comments" field should be incorporated into any revision log (or periodic evaluation log) that provides an area for an explanation of decisions and/or changes made.

BUECI Response to Issue #7

For Issue 7A, BUECI updated DIMP Chapter 10 by adding an entry for records used to decide on the existence of threats and levels of risk to records required to be maintained for 10 years.

For Issue 7B, BUECI added a revision log to the DIMP Plan. In DIMP Chapter 8, BUECI added that the Operations Supervisor (or designee) uses the revision log section to record each significant change and the reason for the change.

Please see the following exhibits:

- Exhibit 8: Chapter 8. Periodic Evaluation and Improvement
- Exhibit 9: Chapter 10. Record Keeping
- Exhibit 10: Chapter 11.4. Plan Re-Evaluation Log

List of Exhibits

Exhibit No.	Title	Supports, Issue No.
Exhibit 1	Chapter 4.2.1. Corrosion through Chapter 4.2.5. Materials, Welds and Joints	1
Exhibit 2	Chapter 4.2.7. Other outside Forces	1
Exhibit 3	Chapter 6.1. Mandatory Additional Actions	1
Exhibit 4	Chapter 3. Knowledge of the Distribution System	2
Exhibit 5	Chapter 4.1. Overview	2, 3, 4
Exhibit 6:	Chapter 5.1. Overview	4
Exhibit 7	Chapter 7.1: Mandatory Performance Measures through Chapter 7.2: Risk Based Performance Measures	5
Exhibit 8	Chapter 8. Periodic Evaluation and Improvement	6, 7
Exhibit 9	Chapter 10. Record Keeping	7
Exhibit 10	Chapter 11.4. Plan Re-Evaluation Log	7

Exhibit 1: Chapter 4.2.1. Corrosion through Chapter 4.2.5. Materials, Welds, and Joints

Chapter 4. THREAT ASSESSMENT

4.1. Overview

To determine the existence of threats to assets operated by BARROW UTILITIES & ELECTRIC CORP, the specified DIMP personnel or their designees perform the following steps:

1. The Operation Superintendent and the Operation Assistant gather data sources described in Chapter 3.
2. The Operation Superintendent reviews the threat categories and interview questions in the SHRIMP™ application.
3. The Operation Superintendent reviews the records gathered and decides whether sufficient data is available to determine whether a given threat exists. If sufficient data is not available, the Operation Superintendent creates a plan to gather any additional data needed.
4. The Operation Superintendent determines how to answer the SHRIMP™ interview questions and decides on any additional information to be entered into SHRIMP™.
5. The Operation Superintendent and the General Manager review the output of the SHRIMP™ threat analysis and decide whether it conforms with their understanding as subject matter experts of the distribution system. If the analysis does not conform with their understanding, they review the interview responses and correct any errors or supplement inputs as needed.

The following threats were evaluated on the distribution piping covered under the scope of this Plan: corrosion, natural forces, excavation damage, other outside force damage, material, weld or joint failure (including compression coupling), equipment malfunction, incorrect operation, and any other concerns that could threaten the integrity of the pipeline. The results of these threat assessments are discussed in the following sections.

4.2. BARROW UTILITIES & ELECTRIC CORP Threat Assessment

4.2.1. Corrosion

Atmospheric Corrosion On The Entire System

Atmospheric corrosion on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Inspections have not found metal loss due to atmospheric corrosion over the past 5 years.
- Leaks caused by atmospheric corrosion leaks have not required repair on any part of your system over the past 5 years.
- ~~Inspections~~ To mitigate the threat of atmospheric corrosion, pipe exposed to the atmosphere undergoes regular inspections with recoating needed as part of the Corrosion Control program described in Section 4E of the OM&E Manual, and these inspections have not found problems with above ground pipe coatings that could not be fixed by routine maintenance

External Corrosion On Coated, Cathodically Protected, Steel Mains And Services

External corrosion on coated, cathodically protected, steel mains and services was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Repaired leaks per mile of mains are not increasing.
- Exposed pipe inspections do not indicate a corrosion problem.
- Cathodic protection of the section is adequate.
- To monitor for and mitigate the threat of external corrosion, buried steel pipe undergoes regular above-ground surveys and maintenance of the cathodic protection system as part of the Corrosion Control program described in Section 4E of the OM&E Manual.

External Corrosion On Bare, Cathodically Protected, Steel Mains And Services

External corrosion on bare, cathodically protected, steel mains and services was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- bare, cathodically protected, steel mains and services are not present.

External Corrosion On Coated, Unprotected, Steel Mains And Services

External corrosion on coated, unprotected, steel mains and services was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- coated, unprotected, steel mains and services are not present.

External Corrosion On Bare, Unprotected, Steel Mains And Services

External corrosion on bare, unprotected, steel mains and services was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- bare, unprotected, steel mains and services are not present.

External Corrosion On Cast, Wrought, Ductile Iron Mains And Services (8" Or Smaller)

External corrosion on cast, wrought, ductile iron mains and services (8" or smaller) was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- cast, wrought, ductile iron mains and services (8" or smaller) are not present.

External Corrosion On Plastic Mains And Services With Metal Fittings

External corrosion on plastic mains and services with metal fittings was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- plastic mains and services with metal fittings are not present.

External Corrosion On Other Metal

External corrosion on other metal was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- other metal is not present.

External Corrosion On Cast, Wrought, Ductile Iron Mains And Services (larger Than 8")

External corrosion on cast, wrought, ductile iron mains and services (larger than 8") was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- cast, wrought, ductile iron mains and services (larger than 8") are not present.

Internal Corrosion On The Entire System

Internal corrosion on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- To monitor for the threat of internal corrosion, BARROW UTILITIES & ELECTRIC CORP has used corrosion coupons and inspects the inside of any removed segment of metal pipe as part of the Corrosion Control program described in Section 4E of the OM&E Manual.. ~~BARROW UTILITIES & ELECTRIC CORP~~These inspections of the inside of metal pipe or coupons removed from metal pipe do not show signs of internal corrosion.
- Leaks caused by internal corrosion have not occurred in BARROW UTILITIES & ELECTRIC CORP.
- Gas received in BARROW UTILITIES & ELECTRIC CORP is pipeline quality.
- Liquids have not been found in BARROW UTILITIES & ELECTRIC CORP piping.

4.2.2. Equipment Malfunctions

Equipment Malfunctions On The Entire System

Equipment malfunctions on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Leaks are not occurring and inspections do not indicate potential equipment malfunctions.
- System does not contain equipment known/prone to malfunction (Industry wide).

- Records of valve inspections specified in Chapter 6 of the OM&E Manual do not indicate equipment malfunctions.

Equipment Malfunctions Due To Failing Valves

Equipment malfunctions due to failing valves was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- failing valves are not present.

Equipment Malfunctions Due To Failing Regulators/relief Valves

Equipment malfunctions due to failing regulators/relief valves was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- failing regulators/relief valves are not present.

Equipment Malfunctions Due To Failing Other Equipment

Equipment malfunctions due to failing other equipment was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- failing other equipment are not present.

Equipment Malfunctions Due To Valves Prone To Failure

Equipment malfunctions due to valves prone to failure was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- valves prone to failure are not present.

Equipment Malfunctions Due To Regulators / Relief Valves Prone To Failure

Equipment malfunctions due to regulators / relief valves prone to failure was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- regulators / relief valves prone to failure are not present.

Equipment Malfunctions Due To Other Equipment Prone To Failure

Equipment malfunctions due to other equipment prone to failure was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- other equipment prone to failure are not present.

4.2.3. Excavation Damage

Excavation Damage Due To Concentrated Damages Or Tickets

Excavation damage due to concentrated damages or tickets was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- There are no areas with concentrations of excavation damages.
- There are no areas with concentrations of locate tickets.

Excavation Damage Due To Your Crew Or Contractor Damages

Excavation damage due to your crew or contractor damages was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Excavation damage has not been caused by operator's crews or contractors.
- BARROW UTILITIES & ELECTRIC CORP's training procedures and operation qualification programs (described in Section 2.H and Section 7 of the OM&E Manual) mitigate against the threat of damage caused by operator's crews or contractors.

Excavation Damage Due To Third Party Damages

Excavation damage due to third party damages was determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Excavation damages have occurred due to third parties during the past few years.
- Excavation damages are being caused by third-party excavators not following one call laws.

To mitigate against this threat, BARROW UTILITIES & ELECTRIC CORP engages in a Damage Prevention Program described in Section 2.E of the OM&E Manual as well as a Public Awareness Program described in its Public Awareness Plan document; nevertheless, the possible consequences of a failure of this portion due to the indicated threat would be higher than for the BARROW UTILITIES & ELECTRIC CORP system in general because:

- The (crews/contractors/excavators) identified for this section have caused damage that resulted in a reportable incident.

Excavation Damage Due To Blasting Damage

Excavation damage due to blasting damage was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- No portions of the system are located where excavation in the area of pipeline would require the use of explosives.
- No portions of the system are in known areas of blasting or demolition activity, such as rock quarries or coal mining,
- No damage has occurred due to blasting.

4.2.4. Incorrect Operations

Incorrect Operations Due To Inadequate Procedures

Incorrect operations due to inadequate procedures was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- failures due to inadequate procedures have not been experienced during the period examined.
- To mitigate against the threat of incorrect operations due to inadequate procedures, BARROW UTILITIES & ELECTRIC CORP's OM&E Manual undergoes annual reviews and updates as needed.

Incorrect Operations Due To Failure To Follow Procedures

Incorrect operations due to failure to follow procedures was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- failures due to a failure to follow procedures have not been experienced.

Incorrect Operations Due To Operator Qualification Revocation

Incorrect operations due to operator qualification revocation was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- no employees or contractors have had operator qualification credentials revoked due to poor performance of any covered task.

Incorrect Operations Due To Drugs And Alcohol

Incorrect operations due to drugs and alcohol was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- no employees or contractors tested positive for drugs or alcohol (other than pre-hire tests).
- BARROW UTILITIES & ELECTRIC CORP mitigates against the threat of incorrect operation due to drugs and alcohol through its Anti-Drug Plan described in Section 2.1 of the OM&E Manual.

4.2.5. Materials, Welds and Joints

Material, Weld Or Joint On The Entire System

Material, weld or joint on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Manufacturing defects on pipe or non-pipe components have not been experienced.
- Failures due to workmanship defects have not been experienced.
- Materials with known problems are not in use.
- BARROW UTILITIES & ELECTRIC CORP mitigates against the threat of material, weld, or joint failures through use of its Joining Procedure for Plastic Pipe and Fittings (found in Section 3.J of the OM&E Manual), Joining Procedures for Steel Pipe (found in Section 3.L of the OM&E Manual), and Required Testing and Inspection of Welds on Steel Pipeline (found in Section 3.O of the OM&E Manual).

Material, Weld Or Joint Due To Manufacturing Defects

Material, weld or joint due to manufacturing defects was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- manufacturing defects on pipe or non-pipe components have not been experienced.

Exhibit 2: Chapter 4.2.7. Other outside Forces

Material, Weld Or Joint Due To Workmanship Defects

Material, weld or joint due to workmanship defects was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- failures due to workmanship defects have not been experienced.

Material, Weld Or Joint Due To Known Problem Materials

Material, weld or joint due to known problem materials was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- none of the known problem materials exist in the system.

4.2.6. Natural forces

Natural Forces On The Entire System

Natural forces on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Leaks, failures or damages are not averaging one (1) or more per year.

4.2.7. Other outside forces

Other Outside Forces On The Entire System

BARROW UTILITIES & ELECTRIC CORP mitigates against the threat of pipeline damages from other outside forces though its Damage Prevention Program, described in Section 2.E of the OM&E Manual. Other outside forces on the entire system was nevertheless determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Leaks, failures or damages are averaging one (1) or more per year.
- Above ground facilities are being hit by vehicles.

The possible consequences of a failure of this portion due to the indicated threat would be about the same as for the BARROW UTILITIES & ELECTRIC CORP system in general.

4.2.8. Other threats

Other Threats On The Entire System

Other threats on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- This system has not experienced failures or other safety problems due to causes that were not addressed during the evaluation of the other seven threats.

Exhibit 3: Chapter 6.1. Mandatory Additional Actions

Chapter 6. ADDITIONAL/ACCELERATED MEASURES TO ADDRESS RISKS

6.1. MANDATORY ADDITIONAL ACTIONS

The following are mandatory additional actions required by DIMP regulations.

LEAK CLASSIFICATION AND ACTION CRITERIA All leaks detected will be repaired as soon as possible, in no case more than 6 months after discovery. Hazardous leaks will be either repaired or brought under control so that they no longer are hazardous before utility personnel leave the scene.

The following procedures from the Natural Gas System Procedural Manual: Operations, Maintenance and Emergencies describe the steps taken by BARROW UTILITIES & ELECTRIC CORP to repair leaks quickly and safely:

- Responding to Gas Leak Reports, described in Section 5.L of the OM&E Manual
- Gas Line Installation, described in Chapter 3 of the OM&E Manual
- Gas Distribution/PRV Station , described in Section 4.F of the OM&E Manual

6.2. RISK BASED ADDITIONAL ACTIONS

The following lists the additional/accelerated actions that will be taken and describes the part of BARROW UTILITIES & ELECTRIC CORP to which each applies to address the priority risks described in the previous section of this Plan.

a. **Section: BARROW UTILITIES & ELECTRIC CORP** portion of BARROW UTILITIES & ELECTRIC CORP

Threat: Excavation Damage -> Third Party Damages

Description: Entire System

For **excavation damage due to third party damages** on the **BARROW UTILITIES & ELECTRIC CORP** section, BARROW UTILITIES & ELECTRIC CORP will:

- conduct pre-construction meetings.
- re-evaluate contractor.

b. **Section: BARROW UTILITIES & ELECTRIC CORP**

Threat: Other Outside Forces

Description: Entire System

For **other outside forces on the entire system** on the **BARROW UTILITIES & ELECTRIC CORP** section, BARROW UTILITIES & ELECTRIC CORP will:

Exhibit 4: Chapter 3. Knowledge of the Distribution System

Chapter 3. KNOWLEDGE OF THE DISTRIBUTION SYSTEM

This Plan was developed based on the design, construction, operation and maintenance records of BARROW UTILITIES & ELECTRIC CORP, including: incident and leak history, corrosion control records, continuing surveillance records, patrolling records, maintenance history, and excavation damage experience, as well as the judgment and knowledge of BARROW UTILITIES & ELECTRIC CORP' employees. The specific elements of knowledge of the infrastructure used to evaluate each threat and prioritize risks are listed in the Threat Evaluation and Risk Prioritization sections of this Plan. These sections also list additional information needed and the plan for gaining this currently unknown information over time through normal activities.

The processes used for Threat Evaluation and Risk Prioritization are the processes found in the Simple, Handy, Risk-based Integrity Management Plan™ (SHRIMP™) software package developed by the APGA Security and Integrity Foundation (SIF). SHRIMP™ uses an index model developed by the consultants and advisors of the SIF. Threat assessment is performed using questions developed by the Gas Piping Technology Committee (GPTC) as modified and added to by the SHRIMP™ advisors. A description of the process followed is included in Section 11.3, "DESCRIPTION OF THE PROCESS FOLLOWED TO DEVELOP THIS PLAN".

Answers to the SHRIMP™ questions are based on records generated through processes described in the Natural Gas System Procedural Manual: Operations, Maintenance and Emergencies (OM&E Manual). The following table lists applicable records and, as applicable, the sections of the OM&E Manual that cover the procedure or record.

Table 3.1. Records Affecting Threat and Risk

Record	OM&E Section
Safety Related Conditions	2.D
Damage Prevention Records	2.E
Failure Investigation Records	2.G
Accident Records	2.J, 5.T
Material and Construction Specs	3.G
Patrol/Survey Records	4.B, 6
Corrosion Control Records	4.E
Incident Reports	5.U
Meter and Valve Inspections	6
Leak Surveys	6
Excavation Records	6
Pressure Test Records	6
Annual Report	N/A
Mechanical Fitting Failures	N/A
Maximum Operating Pressure (MOP)/ Specified Minimum Yield Strength (SMYS)	N/A
Year of Installation	N/A

This Plan will be reviewed at least every 1 year to continually refine and improve this Plan. Reviews may be performed more frequently as described in Chapter 8, *PERIODIC EVALUATION AND IMPROVEMENT* of this Plan.

Records for all piping system installed after the effective date of this Plan will be captured and retained by BARROW UTILITIES & ELECTRIC CORP. This will include the location where new piping and appurtenances are installed and the material of which they are constructed.

Exhibit 5: Chapter 4.1. Overview

Chapter 4. THREAT ASSESSMENT

4.1. Overview

To determine the existence of threats to assets operated by BARROW UTILITIES & ELECTRIC CORP, the specified DIMP personnel or their designees perform the following steps:

1. The Operation Superintendent and the Operation Assistant gather data sources described in Chapter 3.
2. The Operation Superintendent reviews the threat categories and interview questions in the SHRIMP™ application.
3. The Operation Superintendent reviews the records gathered and decides whether sufficient data is available to determine whether a given threat exists. If sufficient data is not available, the Operation Superintendent creates a plan to gather any additional data needed.
4. The Operation Superintendent determines how to answer the SHRIMP™ interview questions and decides on any additional information to be entered into SHRIMP™.
5. The Operation Superintendent and the General Manager review the output of the SHRIMP™ threat analysis and decide whether it conforms with their understanding as subject matter experts of the distribution system. If the analysis does not conform with their understanding, they review the interview responses and correct any errors or supplement inputs as needed.

The following threats were evaluated on the distribution piping covered under the scope of this Plan: corrosion, natural forces, excavation damage, other outside force damage, material, weld or joint failure (including compression coupling), equipment malfunction, incorrect operation, and any other concerns that could threaten the integrity of the pipeline. The results of these threat assessments are discussed in the following sections.

4.2. BARROW UTILITIES & ELECTRIC CORP Threat Assessment

4.2.1. Corrosion

Atmospheric Corrosion On The Entire System

Atmospheric corrosion on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Inspections have not found metal loss due to atmospheric corrosion over the past 5 years.
- Leaks caused by atmospheric corrosion leaks have not required repair on any part of your system over the past 5 years.
- ~~Inspections~~ To mitigate the threat of atmospheric corrosion, pipe exposed to the atmosphere undergoes regular inspections with recoating needed as part of the Corrosion Control program described in Section 4E of the OM&E Manual, and these inspections have not found problems with above ground pipe coatings that could not be fixed by routine maintenance

Exhibit 6: Chapter 5.1. Overview

Chapter 5. RISK EVALUATION AND PRIORITIZATION

5.1. Overview

The Operation Superintendent and the General Manager (or their designees) review the output of the SHRIMP™ risk rankings and decide whether it conforms with their understanding as subject matter experts of the distribution system. If the analysis does not conform with their understanding, they review the interview responses and correct any errors or supplement inputs as needed.

The distribution system operated by BARROW UTILITIES & ELECTRIC CORP consists primarily of high density polyethylene (HDPE) pipe. The exceptions are segments buried under roadways and under the airport. The Bureau of Indian Affairs took this measure not to correct any known deficiencies with the HDPE, but to ensure long-term integrity of the distribution system in areas subjected to additional outside forces.

The typical mixed HDPE/steel distribution system comprises steel legacy pipe combined with HDPE in new and replaced segments. For such a system, where wide variation exists in years of service of steel pipe versus HDPE pipe, a risk analysis would properly feature material-based subgroups of pipe. However, because the configuration of BARROW UTILITIES & ELECTRIC CORP's system is not that of a typical mixed HDPE/steel system, the company's subject matter experts have decided that a system-wide application of threats more accurately models BARROW UTILITIES & ELECTRIC CORP's distribution system.

Of the sections identified during the Threat Assessment as requiring further consideration for additional actions, BARROW UTILITIES & ELECTRIC CORP has determined that the relative risk of these threats to the integrity of these lines ranks in the following priority, beginning with the highest relative risk:

5.2. BARROW UTILITIES & ELECTRIC CORP Section Risk Ranking

a. **Section: BARROW UTILITIES & ELECTRIC CORP** portion of BARROW UTILITIES & ELECTRIC CORP

Threat: Excavation Damage -> Third Party Damages

Description: Entire System

Table 5.1.

Rank	User Rank	SHRIMP Rank	Relative Risk Score	Probability Score	Consequence Score	Leak Cause Factor	Incident Probability Factor
1	0	1	8.3	3.9	1.4	1.216	1.25

Ranked here, in part, for the following reasons:

Exhibit 7: Chapter 7.1. Mandatory Performance Measures through Chapter 7.2. Risk Based Performance Measures

Chapter 7. MEASURE PERFORMANCE, MONITOR RESULTS AND EVALUATE EFFECTIVENESS

7.1. MANDATORY PERFORMANCE MEASURES

BARROW UTILITIES & ELECTRIC CORP will keep records of the following performance measures:

1. The number of hazardous leaks either eliminated or repaired as required by §192.703(c) (or total number of leaks if all leaks are repaired when found), categorized by material; ~~categorized by cause~~;
2. The number of excavation damages;
3. The number of excavation tickets received;
4. The number of leaks either eliminated or repaired, categorized by cause; and
5. The number of hazardous leaks either eliminated or repaired, categorized by material.

In addition, BARROW UTILITIES & ELECTRIC CORP will retain information relating to each hazardous leak resulting from the failure of a mechanical fitting. This information will include, at a minimum:

- Location of the failure in the system;
- Nominal pipe size;
- Material type;
- Nature of failure including any contribution of local pipeline environment;
- Fitting manufacturer;
- Lot number;
- Date of manufacture; and
- Any other information that can be found in markings on the failed fitting

The Operation Superintendent (or designee) annually calculates 5-year medians of each of these measures to establish performance baselines.

7.2. RISK BASED PERFORMANCE MEASURES

The following lists the performance measures that will be tracked and describes the part of BARROW UTILITIES & ELECTRIC CORP to which each applies to evaluate the effectiveness of the additional measures taken to address risks as described in the previous section of this Plan.

a. **Section: BARROW UTILITIES & ELECTRIC CORP** portion of BARROW UTILITIES & ELECTRIC CORP

Threat: Excavation Damage -> Third Party Damages

Description: Entire System

For **excavation damage due to third party damages** on the **BARROW UTILITIES & ELECTRIC CORP** section, BARROW UTILITIES & ELECTRIC CORP will:

- track the frequency of these failures per 1000 tickets.

b. **Section: BARROW UTILITIES & ELECTRIC CORP**

Threat: Other Outside Forces

Description: Entire System

For **other outside forces on the entire system** on the **BARROW UTILITIES & ELECTRIC CORP** section, BARROW UTILITIES & ELECTRIC CORP will:

- track the frequency of these failures.
- operator will be more aware of higher traveled areas where meters may be hit

The Operation Superintendent (or designee) annually calculates 5-year medians of each of these measures to establish performance baselines.

7.3. MONITOR RESULTS AND EVALUATE EFFECTIVENESS

Monitoring results and evaluating effectiveness is addressed in Chapter 8, *PERIODIC EVALUATION AND IMPROVEMENT* of this Plan.

Exhibit 8: Chapter 8. Periodic Evaluation and Improvement

Chapter 8. PERIODIC EVALUATION AND IMPROVEMENT

BARROW UTILITIES & ELECTRIC CORP will conduct a complete re-evaluation of this Plan no less than every 1 year. Trends in each of the performance measures listed in the previous section will be reviewed during the re-evaluation. If any performance measure indicates that any of the additional action taken is not effective in reducing the risk it is intended to address, BARROW UTILITIES & ELECTRIC CORP will consider implementing additional actions to address that risk.

The re-evaluation process consists of an annual meeting among the Operation Superintendent, Operation Assistant, and General Manager (or their designees) that covers the following agenda items:

- Review performance measure trends against baselines
- Re-evaluate preventive actions where a measure exceeds the baseline
- Discuss whether the latest evaluation of threats and risk reflects the current subject matter expert understanding of the distribution system
- Agree on data for updating SHRIMP™

- Re-evaluation of the Plan will also occur when changes occur on the system that may significantly change the risk of failure, including but not limited to:
  - Completion of any additional actions listed in Chapter 6, *ADDITIONAL/ACCELERATED MEASURES TO ADDRESS RISKS* of this Plan,
  - A review of performance measures concludes that a change of approach is warranted.

For each significant change to this plan, the Operation Supervisor (or designee) updates Section 11.4, "PLAN RE-EVALUATION LOG," which contains a detailed log of the re-evaluation including differences between this Plan and previous Plans, the reasons for the changes, the date the re-evaluations were performed and the persons who were involved in the re-evaluation process.

Exhibit 9: Chapter 10. Record Keeping

Chapter 10. RECORD KEEPING

The following records must be maintained be maintained for ten years.

1. This Plan,
2. Copies of previous written DIMP Plans,
3. Records of data required to be collected to calculate performance measures listed in Chapter 7, *MEASURE PERFORMANCE, MONITOR RESULTS AND EVALUATE EFFECTIVENESS*,
4. Records of mechanical fitting failures
5. Records used to decide on existence of threats and levels of risk. These records are listed in Chapter 3, *KNOWLEDGE OF THE DISTRIBUTION SYSTEM.*

Exhibit 10: Chapter 11.4. Plan Re-Evaluation Log

Question	Possible Answers	Weighting
	Moderate	0.05
	High	0.1

Leak Cause Factor

While most leaks are repaired without incident, the SHRIMP advisors felt that the users integrity management plan should consider the relative percentage of leaks by cause.

The Leak Cause Factor equals 1 + the percentage of leaks associated with threat to the total number of leaks for the system.

If the number of total leaks over a five year period are less than 50, the national average is used rather than the users leak history data because with fewer than 50 leak repairs the relative percentages of leaks by cause may be skewed by a handful of leak repairs that are not representative of the system. The national average is shown below, taken from leak repair data reported to PHMSA by all distribution operators on Annual Report Form 7100.1-1..

Table 11.26. Reported Cause Of Failures (2005-2009)

Threat	Failures	Percent	Leak History Factor
Corrosion	399,378	26	1.26
Excavation Damage	161,079	11	1.11
Incorrect Operations	38,416	3	1.03
Material, Weld or Joint Failure	155,255	10	1.10
Equipment Malfunction	326,793	21	1.21
Natural Force Damage	82,565	5	1.05
Other Outside Force Damage	40,529	3	1.03
All Other Causes	329,401	21	NA *
Totals	1,533,416	100	

* Since the threat category "Other" is not assigned a relative risk score by SHRIMP the leak history factor is not used for that threat.

11.4. PLAN RE-EVALUATION LOG

Table 11.27. Plan Re-Evaluation Log

Effective Date	Location of Change	Description of Change	Reason for Change	Persons Involved
2011-08-02		Initial release of plan		General Manager Operation Superintendent Operation Assistant
DRAFT REVISION	Chapter 2 - Definitions	Added definition of mechanical fitting	Reflect change in 192.1001	

Effective Date	Location of Change	Description of Change	Reason for Change	Persons Involved
DRAFT REVISION	Chapter 3 – Knowledge of the Distribution System	Added table of records used to assess threats and risk	Notice of Amendment (NOA) finding 2.A	
DRAFT REVISION	4.1 Threat Assessment/ Overview	Added steps for determining the existence of threats	NOA findings 2.A, 2.B, 3, and 4.A	
DRAFT REVISION	4.2.1 Threat Assessment/ Corrosion	Under Atmospheric Corrosion On The Entire System, cited activities from OM&E Manual that mitigate against the threat of atmospheric corrosion	NOA finding 1	
DRAFT REVISION	4.2.1 Threat Assessment/ Corrosion	Under External Corrosion On Coated, Cathodically Protected, Steel Mains And Services, cited activities from OM&E Manual that mitigate against the threat of external corrosion	NOA finding 1	
DRAFT REVISION	4.2.1 Threat Assessment/ Corrosion	Under Internal Corrosion On The Entire System, cited activities from OM&E Manual that mitigate against the threat of internal corrosion	NOA finding 1	
DRAFT REVISION	4.2.2 Threat Assessment/ Equipment Malfunctions	Under Equipment Malfunctions On The Entire System, cited records from OM&E Manual as evidence against the threat of equipment failure	NOA finding 1	
DRAFT REVISION	4.2.3 Threat Assessment/ Excavation Damages	Under Excavation Damage Due To Your Crew Or Contractor Damages, cited activities from OM&E Manual that mitigate against the threat of damage caused by crew or contractors	NOA finding 1	
DRAFT REVISION	4.2.3 Threat Assessment/ Excavation Damages	Under Excavation Damage Due To Third Party Damages, cited activities from OM&E Manual that mitigate against the threat of third party damage	NOA finding 1	
DRAFT REVISION	4.2.4 Threat Assessment/ Incorrect Operations	Under Incorrect Operations Due To Inadequate Procedures, cited requirements from OM&E Manual that mitigate against the threat of inadequate procedures	NOA finding 1	

Effective Date	Location of Change	Description of Change	Reason for Change	Persons Involved
DRAFT REVISION	4.2.4 Threat Assessment/ Incorrect Operations	Under Incorrect Operations Due To Drugs And Alcohol, cited activities from OM&E Manual that mitigate against the threat of damage due to drugs or alcohol	NOA finding 1	
DRAFT REVISION	4.2.5 Threat Assessment/ Materials, Welds and Joints	Under Material, Weld Or Joint On The Entire System, cited activities from OM&E Manual that mitigate against the threat of material, weld, or joint failure	NOA finding 1	
DRAFT REVISION	4.2.7 Other Outside Forces	Cited activities from OM&E Manual that mitigate against the threat of damage from other outside forces	NOA finding 1	
DRAFT REVISION	5.1 Risk Evaluation and Prioritization/ Overview	Added paragraph describing process of reviewing risk assessment results	NOA finding 4.A	
DRAFT REVISION	5.1 Risk Evaluation and Prioritization/ Overview	Added paragraphs justifying use of a system-wide application of threats	NOA finding 4.B	
DRAFT REVISION	6.1 Mandatory Additional Actions	Cited activities from OM&E Manual related to leak repair	NOA finding 1	
DRAFT REVISION	7.1 Mandatory Performance Measures	Changed the first item to read "Number of hazardous leaks either eliminated or repaired as required by §192.703(c) (or total number of leaks if all leaks are repaired when found), categorized by material."	NOA finding 5.B	
DRAFT REVISION	7.1 Mandatory Performance Measures	Moved information on collecting mechanical fitting data from Chapter 9, Reporting	Moved data collection requirement into appropriate section	
DRAFT REVISION	7.1 Mandatory Performance Measures	Added paragraph about establishing performance baselines	NOA finding 5.A	

Effective Date	Location of Change	Description of Change	Reason for Change	Persons Involved
DRAFT REVISION	7.2 Risk-Based Performance Measures	Added paragraph about establishing performance baselines	NOA finding 5.A	
DRAFT REVISION	Chapter 8 Periodic Evaluation and Improvement	Added paragraph about annual re-evaluation meetings	NOA finding 6	
DRAFT REVISION	Chapter 8 Periodic Evaluation and Improvement	Specified use of Plan Re-Evaluation Log	NOA finding 7.B	
DRAFT REVISION	Chapter 9 Reporting	Moved information on collecting mechanical fitting data to 7.1 Mandatory Performance Measures	Moved data collection requirement into appropriate section	
DRAFT REVISION	Chapter 10 Record Keeping	Added entry for records used to decide on existence of threats and levels of risk to records required to be maintained for 10 years	NOA finding 7.A	
DRAFT REVISION	11.4 Plan Re-Evaluation Log	Added table to contain plan revisions	NOA finding 7.B	