Standard Operating Procedure

Title: **Distribution Integrity Management Program**

Department: Engineering

Procedure Number: **3451.1** Revision Date: **August 1, 2011**

Revision Summary

Original procedure

References:

Regulations

CFR 492 – Part 192 – Subpart P … Gas Distribution Integrity Management (IM)

Procedures

3405 … Leak Survey
3370 … Material and/or Component Failures

Programs

Damage Prevention Program – Refer to each individual company program
Public Awareness Program – Refer to each individual company program

Forms

21760 … Additional or Accelerated Action Implementation
21761 … DIMP Review Summary
21762 … Subject Matter Expert Interview/Input
21763 … GIS Validation

Standard Operating Procedure

REVISION CONTROL SHEET

Document Number: 3451.1

Title: Distribution Integrity Management Program

Document Location: Company Policies and Procedures (General Office Engineering)

Section	Pages	Revision	Date	Comments

Standard Operating Procedure

Table of Contents

1.0 INTRODUCTION

1.1 Overview

This Distribution Integrity Management Plan (Plan) will be used by Montana Dakota Utilities (MDU), Great Plains Natural Gas (GPNG), Intermountain Gas Company (IGC) and Cascade Natural Gas (CNG) to meet the requirements of a Distribution Integrity Management Program (Program) as outlined by CFR Part 192, Subpart P. MDU, GPNG, IGC and CNGC are subsidiary companies operating under Montana Dakota Utility Resources and will be referred to as the "Company" throughout this Plan.

1.2 Purpose

The Company's Program includes all appropriate operating, maintenance and pipeline safety practices routinely performed in addition to the activities described in this written Plan. The Plan establishes the requirements and responsibilities necessary to ensure that the integrity management of natural gas distribution facilities owned and operated by the Company is performed in accordance with Subpart P of 49 CFR Part 192 - Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards (Code). The Company's objective is to operate, maintain, and manage all of its natural gas distribution facilities in a safe and responsible manner without failures or other incidents that could affect public or employee safety, or that could generate service interruptions.

1.3 Scope

All Company operated gas distribution facilities, as defined in §192.3 of the Code, including mains, service lines, service regulators, district regulating facilities, high pressure distribution systems and low pressure distribution systems are subject to the Company's Program.

The Company's specific system facilities are identified in accordance with Section 2.0 of the Plan.

1.4 Program Elements

Seven elements have been identified as the essential components of the Company Program and are discussed in more detail throughout this Plan. These seven elements are as follows:

1) Knowledge of distribution system
2) Identify threats
3) Evaluate and prioritize risk
4) Identify and implement measures to address risks
5) Measure performance, monitor results and evaluate effectiveness
6) Periodic evaluation and improvement
7) Report results

Distribution integrity management is a comprehensive and continuous process that requires the integration of data, processes and operational knowledge. The process shown in Figure 1.1 will be used by the Company to meet the requirements of the seven Program elements.

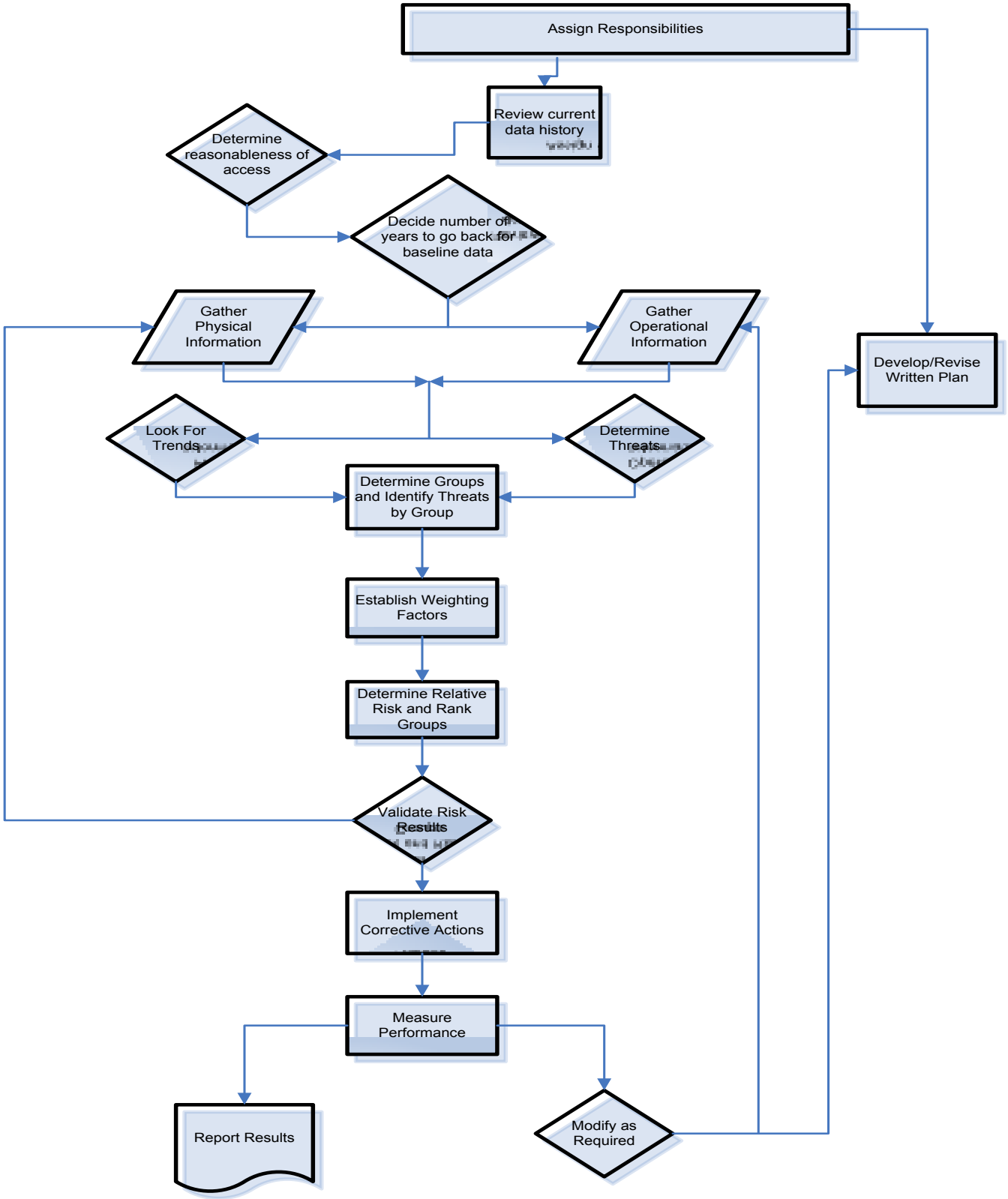

Figure 1.1: IGC Distribution Integrity Management Program Process

1.5 Definitions

1. **Code** – Code of Federal Regulations (CFR) 49, Part 192, Subpart P
2. **Company** – Montana Dakota Utilities, Great Plains Natural Gas, Intermountain Gas Company and Cascade Natural Gas
3. **DIMP** – Distribution Integrity Management Program
4. **Hazardous Leak** - leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous
5. **Transmission Pipeline** – A natural gas pipeline, other than a gathering line, that fits one of the following criteria:
    - Operates at a hoop stress of 20% more of SMYS
    - Transports gas from a gathering line or storage facility to a distribution center, storage facility, or large volume customer that is not down-stream from a distribution center
    - Transports gas within a storage field
6. **Distribution Pipeline** – A natural gas pipeline other than a transmission or gathering line
7. **Specified Minimum Yield Strength (SMYS) –** The minimum yield strength of a steel pipeline in accordance with a listed specification or in accordance with 192.107
8. **Maximum Allowable Operating Pressure –** The maximum pressure at which a pipeline or segment may operate
9. **Plan –** Written document describing actions the Company will take to satisfy the requirements of a Distribution Integrity Management Program (CFR 192 Subpart P)
10. **Program –** The actions and/or activities the Company will take to satisfy the requirements of CFR 192 Subpart P

1.6 Responsibilities

1.6.1 IGC and CNG

Responsibilities associated with the Program for IGC and CNGC are listed below. The Distribution Integrity Management Organization Structures for IGC and CNGC are shown in Figures 1.2 and 1.3 respectively.

1.6.1.1 Vice President of Operations

- Monitor the implementation and continuance of the Plan
- Ensure adequate budget and personnel are committed to effectively pursue the purpose of the Plan
- Perform oversight of the Plan
- Approve the Plan
- Approve changes to the Plan

1.6.1.2 Management Personnel

The Manager, Engineering Services and the Manager, Operations Services are responsible to:

- Provide adequate personnel, tools, equipment and supervision necessary to meet the required activities described in the Plan
- Ensure that appropriate employees receive training necessary to perform the duties required by the Plan
- Select and hire service providers as needed
- Program Approval

1.6.1.3 General Office (GO) Engineering

- Perform day-to-day implementation and management of Plan
- Communicate Plan requirements and activities to both Management and Regional Personnel
- Perform the documentation and communication responsibilities specified in the Plan
- Supervise service providers as necessary
- Review and make updates to the Plan as necessary or required

1.6.1.4 Regional Managers

- Provide adequate personnel, tools, equipment and supervision necessary to meet the required activities described in the Plan
- Ensure that appropriate employees receive training necessary to perform the duties required by the Plan
- Select and hire service providers as needed

1.6.1.5 Operations/District Managers

- Perform the documentation and communication responsibilities specified in this Plan
- Supervise service providers as necessary

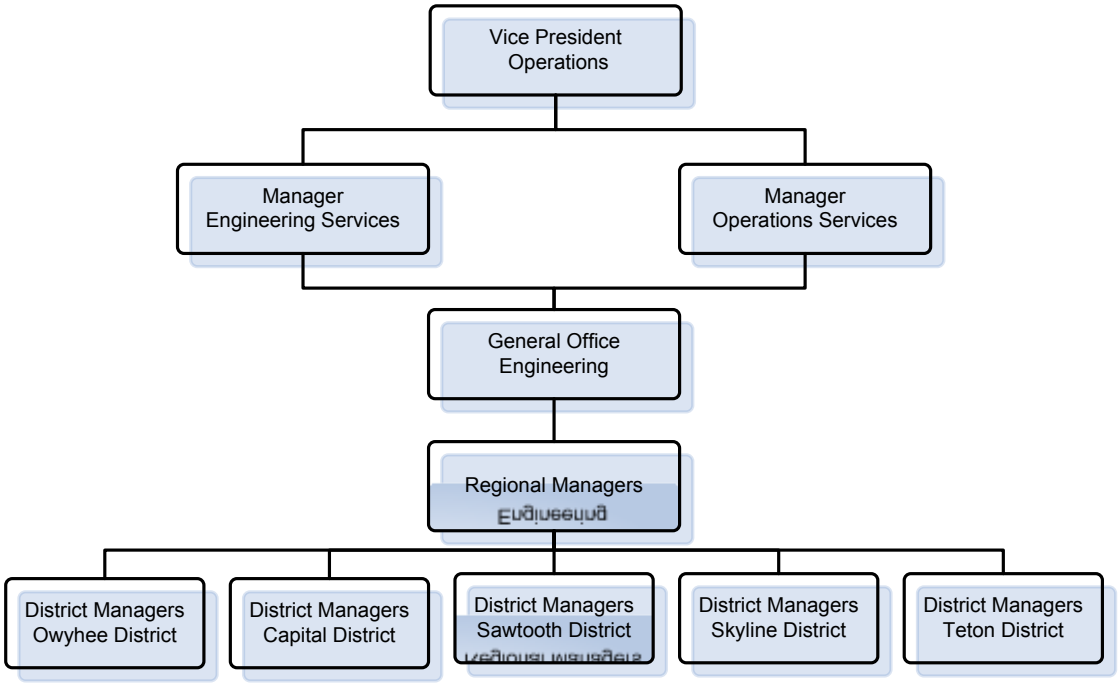

Figure 1.2: IGC Distribution Integrity Management Organization Structure

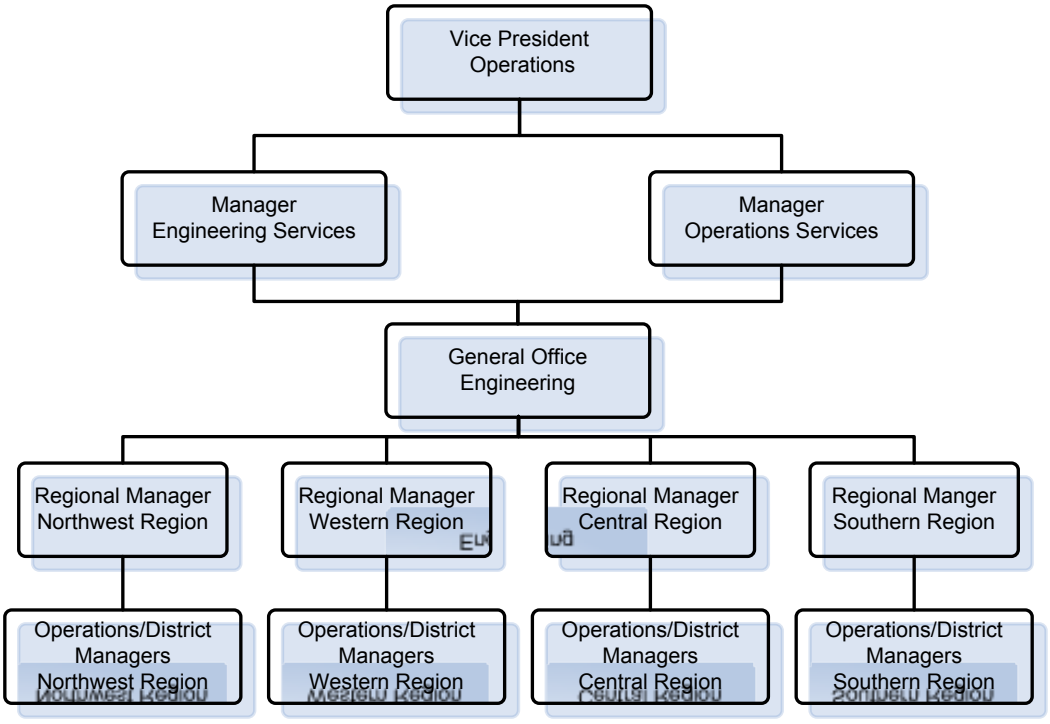

Figure 1.3: CNGC Distribution Integrity Management Organization Structure

1.6.2 MDU/GPNG

MDU/GPNG responsibilities as they relate to the Program are listed below. The Distribution Integrity Management Organization Structures for MDU/ GPNG is shown in Figure 1.4.

1.6.2.1 Vice President of Operations and Region Managers

- Monitor the implementation and continuance of the Plan within the company
- Ensure adequate budget and personnel are committed to effectively pursue the purpose of the Plan
- Perform oversight of the Plan
- Approve the Plan
- Approve changes to the Plan

1.6.2.2 Gas Distribution Engineering (General Office Engineering)

- Perform day-to-day implementation and management of the Plan
- Oversee and coordinate the implementation of the elements of the Plan
- Ensure all Documentation and Communications specified in the Plan are completed and submitted
- Provide adequate personnel, tools, equipment and supervision necessary to meet the required activities described in the Plan
- Ensure that appropriate employees receive training necessary to perform the duties required by the Plan
- Select and hire service providers as needed
- Review and make updates to the Plan as necessary or required

1.6.2.3 Regional Gas Superintendents

- Provide adequate personnel, tools, equipment and supervision necessary to conduct the Field activities described in the Plan.
- Ensure all Field documentation, Date collection, and Communications specified in the Plan are completed and submitted.

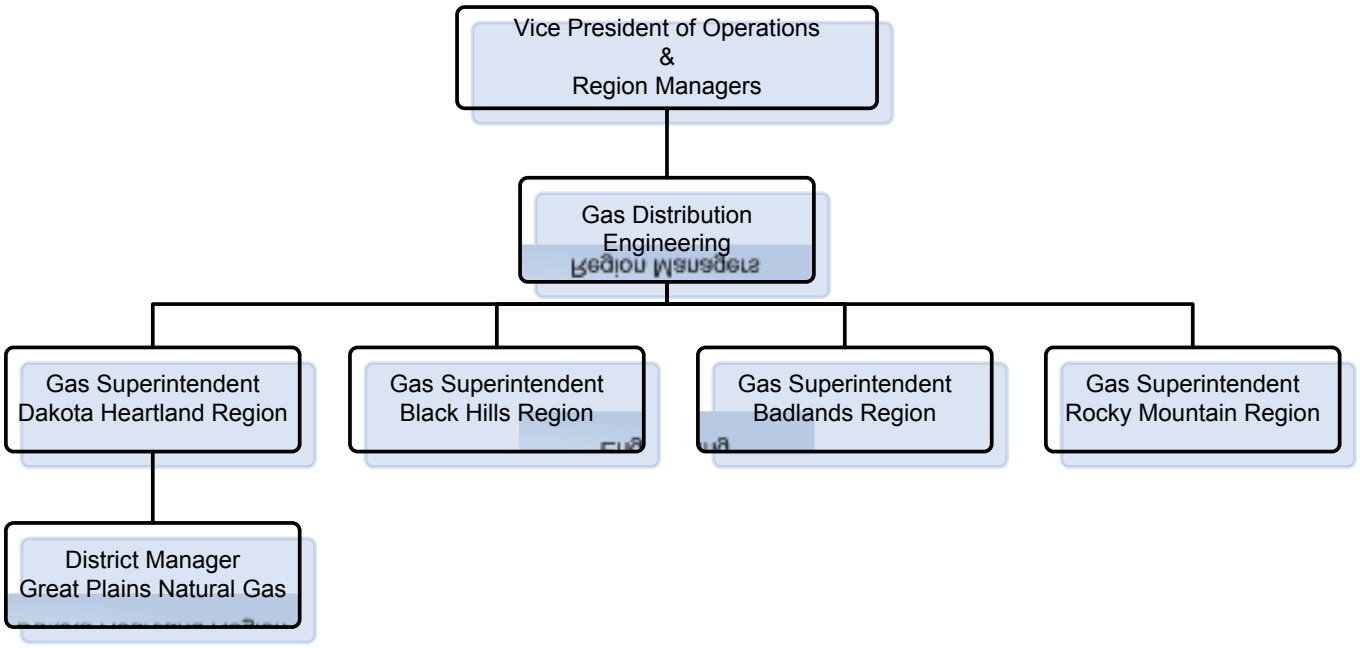

Figure 1.4: MDU Distribution Integrity Management Organization Structure

2.0 KNOWLEDGE OF DISTRIBUTION SYSTEM [§192.1007 (A)]

2.1 Overview

In order to determine threats and assess risks on the distribution system, the Company begins by collecting appropriate information specific to the facilities within the distribution system. The information is found in two general categories: the physical make up of system components and the operating and maintenance history of those components.

The data listed in Section 2.2 will be collected to the extent it currently exists in at least one of the company record systems (e.g., maps, paper forms, cards, electronic data bases or files, photographs) or in the knowledge and experience of operations and maintenance personnel. The Company will assemble this data for a minimum of the previous five (5) years from the effective date of this Plan to establish a baseline to begin trending of data on a go forward basis to the extent that it is reasonably available. If data in certain areas is not reasonably available to establish a 5 year historic baseline, the Company will document this and make a determination of whether enough information has been included or consider whether further information gathering should be required.

Additional data collected on piping and appurtenances installed within the Company's distribution system after the effective date of this Plan is included in Section 2.5.3.

2.2 Physical Infrastructure

2.2.1 Pipe Material

2.2.1.1 Plastic

- Plastic Polyethylene (PE)
- Poly Vinyl Chloride (PVC)
- Adydl-A
- Others [either old or new]

2.2.1.2 Steel

2.2.2 Pipe Specifications

- Nominal Diameter

2.2.3 Construction

- Year Installed
- Location
- Casing size
- Highway/road crossing
- Water crossing

2.2.4 Corrosion

- Below ground coating type

2.2.5 Valves

- Location

- Material or construction
- Year manufactured/installed

2.3 Historical Information

2.3.1 Documentation of Leaks and Other Maintenance

- Repairs (categorized by cause)
- Leaks (categorized by cause)
- Exposed Pipe Inspection Reports

2.3.2 Excavation Activity

- Number of underground locate request received

2.3.3 Operating Pressure

- Normal Operating Pressure

2.4 Outside Source Data

The Company may use data from outside sources to gain knowledge about facilities. Such information may include flood zones, population data, wild fire zones, etc. When data from an outside source is used, the following information must be collected and retained in Appendix D.

- Description of Data
- Geographic coverage
- Data Source/Agency
- Source Format/File Type
- Source URL (if applicable)

2.5 Information evaluation

The information collected in Section 2.2 and 2.3 will be entered and made available electronically using the Company's Geographical Information System (GIS). The GIS system will be used both visually and quantitatively to evaluate the collected information.

2.5.1 System segmentation/grouping

2.5.1.1 Grouping

The Company will use the GIS system to group facilities into two categories:

- Mains
- Services

2.5.1.2 Segmenting

Facilities within the distribution system will be segmented into fifty (50) foot sections. Information specific to each segment will be available in the GIS.

2.5.2 Analysis §192.1007 (a)(2)

2.5.2.1 Sufficient Data

General Office Engineering will review and evaluate the aggregated data to identify areas where data is insufficient. Segments where little or no data is available or missing will be analyzed to determine if additional information is required. If additional information is required, General Office Engineering will develop the methods necessary to gather the appropriate information per Section 2.4.3. Information gathering methods may include but are not limited to the following:

- Field verifications/pipe exposures
- Subject Mater Expert (SME) input
- Related documentation (pressure testing, construction records, Repairs, etc.)

Missing data will also be taken into consideration when evaluating and ranking risk described in Section 4.0

2.5.2.2 Tracking and Trending

Tracking and trending of the data (e.g., leaks, equipment failures, and third-party damage occurrences) is performed at this time to the extent it is not done through another system. The Company will use such trends, when appropriate, in prioritizing risks and measuring the effectiveness of risk management practices implemented.

Based on the analysis of the information collected, the Company may consider alternative segmentation of its distribution system in order to focus on certain portions of the system.

2.5.3 Developing Additional Information

When analysis and threat assessment indicate that additional infrastructure information may be useful or necessary, the Company will determine at that time what additional information should be collected. Such determination may be triggered by the desire to perform a more focused threat and risk analysis, an indication that a different grouping would provide better understanding of risk, or indications that more information is required to evaluate future potential threats or other currently unforeseen reasons.

Except in unusual cases, the identified additional information will be gathered through normal activities. In order to accomplish this, one or more of the following steps may be implemented:

- Forms or other methods used to collect information related to the physical attributes and/or operating and maintenance activities of distribution pipeline facilities are appropriately modified
- Personnel are trained to properly collect and record the expanded information and use the modified forms or data collection format
- Recordkeeping procedures and/or data management systems are updated to accept new data points

- Newly collected information is integrated into all other records

2.5.4 Newly Installed Facilities

The information detailed in Section 2.2 and 2.3 will be entered into the Company's GIS for new facilities installed after the effective date of this Plan.

2.5.5 Ongoing Data Verification

The Company will continuously update and validate facility information during routine operational activities such as maintenance, construction, and repairs or through Additional or Accelerated Actions described in Section 5 of this Plan. SME input may also be used when updating or validating information. When modifications are made to existing facility information described in Section 2.2 or 2.3, Form 21763 – *GIS DIMP Validation* or similar documentation shall be completed and retained in Appendix E for a minimum of ten (10) years.

3.0 THREAT IDENTIFICATION [§192.1007 (B)]

3.1 Overview

After gathering and evaluating the information outlined in Section 2, the Company will determine which threats, if any, could affect the current or future integrity of a particular facility segment. Threats for each facility segment will be categorized into the following:

- Corrosion
- Natural Forces
- Excavation Damage
- Other Outside Force Damage
- Material, Weld or Joint Failure (including mechanical couplings)
- Equipment Failure
- Incorrect Operation
- Other – Forces unique to a particular area on the system.

If data used for threat identification and categorization are insufficient or suspect, each threat covered by the missing or insufficient data is assumed to apply to the segment being evaluated until the process described in Section 3.4.3 is implemented and begins to produce adequate information. Unavailability of information is not justification for exclusion of a threat. Where data are missing or insufficient, conservative assumptions are used in the risk assessment based on SME conversations and engineering decisions. Alternatively a higher priority may be assigned to the facility segment.

Threats determined through the above analysis are indicative of the likelihood of occurrence on the segment. The degree of the threat to each segment will be addressed in the risk assessment equation.

3.2 THREATS

3.2.1 Corrosion

All metallic pipe and components are subject to the threat of external corrosion. The threat of internal corrosion will be identified only where the expectation of liquid water being present due to a documented event in the facility segment exists or when an internal pipe inspection has shown corrosion to be present on the inside surface of the facility. The Company does not transport corrosive gas in its distribution system therefore internal corrosion is unlikely. Atmospheric corrosion is a subset of external corrosion that will occur only on pipe and components that are not buried. For exposed pipe in areas where only a light surface oxide forms that does not affect the safe operation of the facility (§192.479), the threat of atmospheric corrosion will not be identified.

3.2.2 Natural Forces

The threat of natural forces is primarily weather related. While Company facilities experience a wide range of atmospheric temperatures, the range is within the design limits of the materials of construction. All facilities in areas of known or reasonably anticipated land subsidence (including frost upheaval), landslides, earthquakes, significant or severe lightning activity, flooding, sinkholes or washouts will be susceptible to a natural forces threat. Some above ground facilities may be susceptible to natural forces such as wind effects or excessive weight due to ice accumulation.

3.2.3 Excavation Damage

All buried facilities in the Company's distribution system face the threat of being damaged by excavation activities. Consideration is given to piping within protective casings, inside underground structures such as basins or vaults which may be shielded or protected from excavation damage.

3.2.4 Other Outside Force Damage

Only aboveground facilities are considered when determining if this threat is present. The primary concern is areas where gas piping is close enough to vehicular traffic such as automobiles, trucks, forklifts, construction equipment, etc., where it may be reasonably expected that damage from vehicle movement could occur. Facilities in locations known to be subject to vandalism, destruction, wreckage, sabotage, or other harm (e.g., unauthorized adjustment or valve movement) may carry the other outside force damage threat.

3.2.5 Material, Weld or Joint Failure (Including Mechanical Fitting Failures)

This threat is identified by the Company when it is known or anticipated that potential defects in pipe, fittings, components and joints that were introduced during the manufacturing process may be present. Longitudinal pipe seams made by low frequency ERW before 1970, electric flash welding, lap welding, hammer welding, or butt welding and fittings or components fabricated by welding may pose a weld-related material threat. Defects within fittings and components from the manufacturing process are material threats. Certain plastic piping materials (e.g., Century Utility Products pipe, Low-ductile inner wall Aldyl A pipe manufactured before 1973, PE3306 pipe, PVC pipe and fittings, CAB pipe material) are subject to this threat. Where it can be determined that pullout from a mechanical coupling can be anticipated (e.g., a non-pullout-resistant coupling installed at a location in the distribution system where thrust force can be expected), the joint failure threat will be determined to apply.

3.2.6 Equipment Failure

The Company will consider items of equipment exhibiting possible systemic problems as vulnerable to the equipment malfunction threat. Such items may include regulator or relief valves (e.g., failing to perform the intended task or operating outside of the manufacturer's specified tolerances), repeated history of failed flange gaskets, repeated history of failed O-rings, repeated history of broken pipe or stripped threads, equipment with a history of problems (e.g., a particular style or model, mechanical couplings).

3.2.7 Incorrect Operation

The threat of inappropriate operation may be applicable to either operating (e.g., start up or shut down of a pipeline, purging) or maintenance activities (e.g., ignition of escaping gas). This threat is associated with internal or external personnel. It does not include the designed operation of a device. Poor workmanship or outdated methods during the construction or installation process (e.g., acetylene girth welds, wrinkle bends, cast iron joining or inadequate support) are considered within this threat category. Knowledge of instances where personnel have not followed approved procedures (e.g., modification of a mechanical coupling contrary to the manufacturer's recommendation, failure to install a stiffener) could lead to identification of an incorrect operation threat.

3.2.8 Other

The Company will determine if other threats are present around its distribution system that is not covered in the threats described above. Such threats will likely be attributable to special circumstances in specific locations on the system. Accelerated material deterioration not resulting from a material defect or corrosion could come under this threat category.

4.0 RISK EVALUATION AND RANKING [§192.1007 (C)]

4.1 Overview

The Company approaches risk assessment through determining the relative risk of facilities grouped by mains and services of similar attributes and/or experiencing similar problems. The magnitude of the relative risk determination will lead to ranking of groups for the application of risk management measures.

4.2 Risk Model

The Company uses a GIS based risk model to calculate relative risk scores for facilities. The risk model is designed to use facility data collected in Section 2 to calculate risk for facilities grouped by mains and services and segmented into fifty (50) foot sections.

4.2.1 Determination of Risk Weighting Factors

The Company determines appropriate likelihood (category scores) and consequence factors (impact score) through the use of employees who are knowledgeable in the operation, maintenance, design and construction of its distribution system (i.e. SME's). Operational history and maintenance records will also be used when determining risk factors. Outside consultants and trade associations or other operators with expertise in gas distribution industry trends or historical methods are used when it is determined to be necessary.

GO Engineering will review the available information to determine relevant factors to be used in the risk analysis. Factor determination is overseen by GO Engineering and approved by the Vice President - Operations.

Adjustment of the weighting factors is allowable, appropriate and expected. One reason may be a validation of risk calculation results with actual field experience as described in Section 4.2.5. Weighting factors may also be adjusted for each operational area as opposed to applying global numbers to all Company facilities when deemed necessary by GO Engineering. Improvement of the distribution system and the Plan over time is expected and will likely require modification of some of the weighting factors.

4.2.2 Likelihood Factors

Numerical weightings of likelihood factors are determined as a result of facility attributes represented by the group. A zero to five scale is used where five represents greatest possibility of occurrence. Based on the weighting factors assigned to each group, a likelihood factor is calculated for each fifty foot segment within a facility group.

The likelihood factors assigned to each group based on the threat can be found in Appendix B.

4.2.2.1 Factors for Missing Data

In the case that facility attributes are missing or unknown within a group feature, likelihood factors will be determined for "unknown" data where it is used by the risk model. The generally accepted risk approach to "unknown" data is that because of the uncertainty it should add risk to the overall risk calculation. The company will assign higher risk numerical weights or likelihood factors to be used by the risk model. The company will identify and evaluate these gaps in the data and use the processes indicated in Section 2.4 to determine and gather the missing data over time.

4.2.3 Consequence Factors

Company assigns numerical weighting factors to represent consequences that may be anticipated in case of an integrity issue involving the facility groups.

Consequence factors are based on the location of the facility in relation to population density as well as the amount of gas that could potentially be released. Additional consideration may be given to "Critical Infrastructures" as defined in the Homeland Security Act (P.L. 107-56) depending on the availability and accuracy of the data. The consequence factors are assigned in three general categories:

1) Population density and location
2) Potential Energy of Pipeline based on the operating pressure and pipe size
3) Critical infrastructure size and location

A higher number represents a greater relative consequence that might result. The numbers from the three categories are then added to create an overall consequence factor. The consequence factors assigned to each general category can be found in Appendix B

4.2.4 Relative Risk Analysis

Risk is the product of the likelihood of an event occurring multiplied by the consequence of the event. In equation form:

Risk = ***Likelihood*** (category score) **x** ***Consequence*** (impact score)

The model uses the sum of each likelihood score for each threat to calculate a total likelihood factor. This factor is then multiplied by the total consequence factor to establish a total relative risk score for the facility segment. This is repeated for all groups to determine the relative risk of each group compared to all others in the Company distribution system.

After the relative risk is calculated for all threats for all groups, comparison of the relative risk numbers leads to those groups of the system where risk management practices should be implemented in order to improve the overall safety of the distribution system.

4.2.5 Validation of Relative Risk Ranking Results

After the groups and threats are ranked according to the numerical relative risk determination, departmental personnel, in conjunction with supervisory and other knowledgeable persons, review the results to determine if the results accurately reflect what is known about the system and the problems that are being experienced.

When inconsistencies are discovered, further review of the information and assigned factors is undertaken. Where appropriate, likelihood and/or consequence factors are adjusted and the calculation redone. Groups may be redefined and in other cases it may be determined that all factors are appropriate and the results lead to previously unanticipated high risk groups.

5.0 SELECT AND IMPLEMENT RISK MANAGEMENT ACTIONS [§192.1007 (D)]

5.1 Overview

Risk management is accomplished by acting to reduce the likelihood of an occurrence, by alleviating the consequences of an occurrence, or both. Appropriate actions are dependent on the group being addressed, the associated threat, whether the threat is current or potential in the future and the viability of the actions in managing the relevant risk factors.

5.2 Existing Programs Addressing Risk Management

This section summarizes existing plans and programs implemented by the Company that are currently in place to manage risks. Each established program contributes to the management and mitigation of risk to the distribution system. Details for each program are contained in Company Operations and Maintenance procedures and are available upon request.

5.2.1 Damage Prevention

The prevention of damage to natural gas distribution facilities by excavation is one of the most effective ways of increasing the integrity of the gas system and improving public safety relative to natural gas. The Company has implemented and maintains a Damage Prevention program that meets the following criteria:

- Meets or exceeds the requirements of §192.614 – Damage Prevention Program
- Participate in one-call programs within service territory
- Supports the Common Ground Alliance (CGA) efforts to reduce excavation damage through the publication and dissemination of best practices

5.2.2 Leak Management

The Company recognizes that managing leaks from its distribution system is an important part of addressing the integrity of the system and reducing risk by reducing the potential consequences of a leak. The Company has a long standing leak management program that includes the following elements of an effective leak management program.

5.2.2.1 Locate

Leaks are located through routine and specially scheduled leakage surveys with leak detection equipment. Additionally, all leak and gas odor complaints are responded to and investigated to locate leaks that occur which are not present at the time of a leakage survey.

Leakage surveys are performed with flame ionization and/or optical methane detector equipment in locations outside of buildings. Intrinsically safe gas detection instruments may be used indoors as a screening tool for detection of the actual leak location.

5.2.2.2 Evaluate

The Company evaluates each leak detected in accordance with company leak survey procedures. Leaks are located, confirmed and classified when a sustained reading is obtained on a combustible gas indicator.

Based on the classification of the leak, additional actions may be required per company leak survey procedures. For the purpose of reporting under Section 9.1 of this Plan, the company uses the following criteria to define a hazardous leak:

- Leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous (§192.1001)

5.2.2.3 Act

Take appropriate action to mitigate these hazardous leaks. Confirmed leaks are repaired or monitored as specified in company leak survey procedures. All leaks classified as hazardous leaks are repaired or eliminated before company personnel leave the scene. Leaks considered non-hazardous may be immediately repaired, scheduled for repair or monitored depending on perceived potential of becoming more severe.

5.2.2.4 Keep records

Every confirmed leak is given a unique identifier and is tracked until it is repaired and subsequently cleared. Leak locations are tied to an address and are initially "assigned" to a main, service pipe or other unit such as a district regulating station or meter number. Leak records, including repair action and clearing confirmations are retained at the local operating area. All leak records are retained for the life of the affected facility**.**

5.2.2.5 Self-assess

Determine if additional actions are necessary to keep people and property safe. Appropriate District Operations personnel routinely review leak survey, classification and repair results to ensure that all leaks discovered receive proper response. The Company reviews and trends the overall results of the leak management program per Section 6 of the Plan. When appropriate implementation of additional risk control practices or modifications to the leak management program are evaluated.

5.2.3 Public Awareness

The awareness of the public of pipelines in their vicinity and the public's understanding of how pipelines are operated contributes to the continued safe operation of those pipelines. The knowledge that pipelines may exist in close proximity and the hazards that may result from uninformed activities nearby reduces the likelihood factor of risk. The familiarity with being able to recognize a leak and knowing how to report such an event lessens the consequences of a potential emergency condition.

The Company’s Public Awareness Program contains provisions consistent with Table 2-2 in the API Recommended Practice 1162, Public Awareness Programs for Pipeline Operators. The overall Public Awareness Program meets or exceeds all requirements of §192.616 and API RP 1162.

5.2.4 Operator Qualification Program

The Operator Qualification (OQ) Program developed and administered by the Company ensures that personnel performing covered tasks on distribution pipeline facilities have the

necessary knowledge, skills and abilities to safely perform those tasks with a minimum possibility of human error.

The evaluation and qualification of personnel reduces both the likelihood and consequences of a pipeline incident caused by human error. The Operator Qualification Program meets or exceeds the requirements of Part 192, Subpart N for such programs. The intervention of knowledgeable and skilled personnel in an impending or actual pipeline failure can reduce the consequence segment of the risk equation.

5.2.5 Drug and Alcohol Misuse Prevention Plan

The Company recognizes that the use of controlled substances and the misuse of alcohol may be contributing factors to human error. The reduction of an individual's normal capabilities while under the influence of drugs or alcohol can cause inferior performance of covered functions that affect both the likelihood and consequences factors in the risk equation. The Company's drug and alcohol control plans are in full compliance with Part 199 and Part 40 requirements.

5.3 Additional or Accelerated Actions

The Company intends to review additional or accelerated (A/A) actions listed in Table 5.1 to determine if any actions are suitable to its distribution system with a high degree of expectation of risk reduction. This will be done after the initial risk ranking to ensure the areas of highest potential risk are focused on first.

Where A/A actions from Table 5.1 cannot be reasonably applied, the highest relative risk ranking groups may be further segmented in order to address the highest priority first. An updated risk assessment may need to be performed with the new groupings to reveal if overall rankings changed.

Table 5.1: Additional or Accelerated Actions

Threats		Possible A/A Actions
Primary	**Subcategory**	
Corrosion	External Corrosion	• Increase frequency of leak surveys • Pipeline replacement • Provide additional cathodic protection devices (e.g. anodes, rectifiers, etc.) • Correct cathodic protection deficiencies
	Internal Corrosion	• Increase frequency of leak surveys • Pipeline replacement • Install liquid collection components (e.g. drips, strainers, etc.) • Install pipe liners • Evaluate gas quality at supply inputs, take corrective action with supplier
	Atmospheric Corrosion	• Increase frequency of atmospheric corrosion surveys • Pipeline/component replacement • Apply/refurbish coating • Relocate

Natural Forces	• Outside Force • Weather • Flooding • Extreme Temperatures • Land Movement	• Relocate pipe from high risk location • Replace pipe in high risk location • Install slip or expansion joints to allow for movement • Install and monitor strain gauges on pipe • Install automatic shut-off component (e.g. excess flow valve) • Conduct leak survey after earth movement events (e.g. earthquake, flood, etc.
Excavation Damage	• Third-party damage • Operator Damage	• Conduct enhanced awareness education • Request regulatory intervention (e.g. implement fines for occurrences) • Inspect targeted excavation and backfill activities • Inspect for facility support • Improve accuracy of locating • Participate in pre-construction meetings with project engineers and contractors in high-risk areas • Use warning tape • Expand the use of excess flow valves • Improve system map accuracy and availability • Recruit support of public safety officials (e.g. fire department) • Install additional pipeline markers
Other Outside Force Damage	Fire/Explosion	• Provide first responder training • Install curb valves • Improve response capability • Expand the use of excess flow valves
	Vehicular	• Expand policy on when and how to install protection • Increase frequency of patrols/inspections of high-risk facilities • Evaluate the need to relocate hard-to-protect facilities • Expand the use of excess flow valves
	Leakage (previous damage)	• Inspect exposed pipe prior to backfill • Increase frequency of leak surveys
	Vandalism	• Install or improve fences/enclosures • Increased surveillance • Relocate hard-to-protect or critical facilities
	Blasting	• Perform leak survey after blasting • Relocate away from frequent blast areas (e.g. mines) • Re-establish MAOP after blasting (e.g. pressure test)
Material Weld or Weld Failure	• Manufacturing Defects • Construction/Workmanship defects • Mechanical Damage: ➢ Pipe Material ➢ Pipe Component	• Increase frequency of leak surveys • Replace or repair • Revise construction procedures • Revise material standards • Track/trend material failures
Equipment Malfunction	• Malfunction of System Equipment • Obsolete equipment	• Replace or repair • Increase frequency of inspection/monitoring • Investigate if equipment being used is appropriate for the situation/location • Improve installation procedures • Track/trend equipment failure

In-Appropriate Operation	• Inadequate procedures • Inadequate safety practices • Failure to follow procedures	• Improve procedures • Improve training • Evaluate other locations where inadequate practices may have been used • Perform internal audits or inspections
Other	Odorant issues Missing or unknown data	• Increase frequency of leakage survey • Increase odorant levels • Increase frequency of odorant testing • Improve locations for odorant testing • Perform pipe or facility exposure to collect missing or unknown data

5.3.1.1 A/A Action Implementation

When A/A actions are implemented as a result of the risk results associated with this Plan, they shall be documented using Form 21760 – *Additional or Accelerated Action Implementation*. Documentation will at a minimum contain the following information:

- Description of A/A action being implemented
- Threat(s) that the A/A action addresses
- Description of the location that the A/A action is being implemented
- A/A action duration and/or schedule
- Date that the A/A action is to be implemented
- Date the A/A action is completed (if applicable)

Form 21760 will be kept with the respective operating Company's Program and available upon request.

5.3.2 Current Risk Reduction Practices

The Company has for a number of years performed operation and maintenance activities that are beyond the requirements of Federal and State natural gas safety regulations. A review of the O&M plan and operating area practices produced the following list (not all inclusive) of such practices.

- Quarterly leak surveys in urban areas
- Semi-annual leak survey at selected large customers
- Flood patrol of underground regulator stations during heavy rains
- Stand by, or daily visits, by locator on large construction projects
- Onsite Company personnel during excavations near critical facilities
- Ongoing planned PVC replacement priority
- Bare steel main and service line replacement program

- Periodic meetings with local emergency responders
- Pressure monitoring systems with automatic high and low pressure alarms
- Using additional pipeline markers when necessary

These practices cover a number of the most prevalent threats to Company distribution systems. Available data pertinent to the effectiveness of the activities are reviewed, and trended when possible, to support decisions whether or not to continue them. Where current programs or activities appear to be addressing the threat, no further activity is anticipated unless the stable or improving safety trend deteriorates.

6.0 MEASURE PERFORMANCE, MONITOR RESULTS AND EVALUATE EFFECTIVENESS [§192.1007 (E)]

6.1 Overview

The Company uses performance measures to provide a means to measure, communicate and improve the Program over time. The measures will provide a basis for implementing improvement efforts, including the actions described in Section 5, to support the Program goal of improving the integrity of the Company's distribution system.

6.2 Required Performance Measures

The required measures below are collected annually for each state and Company.

- Number of hazardous leaks (as defined in Section 5.2.2.2) either eliminated or repaired, categorized by cause (cause categories will match those of the annual distribution report)
- Number of excavation damages
- Number of excavation notification tickets received from Company service territory one call centers by state (see Table 9.1)
- Total number of leaks either eliminated or repaired, categorized by cause
- Number of hazardous leaks (as defined in Section 5.2.2.2) either eliminated or repaired by material

The baseline statistics used for the above metrics will be the trend over the previous five (5) years from the effective date of this Plan.

6.3 Additional Measures

Performance measures the Company will collect in addition to those described in Section 6.2 are listed in table 6.1.

Table 6.1: Additional Performance Measures

Metric Description		Reporting Frequency	Metric Baseline
Company Total Relative Risk of Mains by state		Annual	August 2011
Company Total Relative Risk of Services by state		Annual	August 2011
Risk by Threat Category	• Corrosion • Equipment Failure • Excavation Damage • Incorrect Operation • Material Failure • Natural Forces • Outside Forces • Weld or Joint Failure • Other	Annual	August 2011
Risk added due to missing or unknown data		Annual	August 2011
Company Excavation Damages per 1000 locates by State		Annual	2006-2011
Accelerated Actions implemented as a result of the Program		Annual	August 2011

Additional performance measures are not limited to those listed in Table 6.1. The Company may choose to collect, track and trend other measures based on the results of activities required by this Plan. When information is collected to track and trend the results of implemented A/A actions, it should be collected on a schedule commensurate with the performance activity being measured.

6.4 Information Gathering

The Company will use the GIS as the primary means for gathering information pertinent to the performance measures listed in Sections 6.2 and 6.3. If the information is not available in the GIS, paper documents and/or other electronic sources may be used to collect the necessary information. Once the information is gathered, it shall be kept in a central electronic location (e.g. Excel, Access, etc,) where the statistical data can be trended over time. The gathered information shall be available upon request.

6.5 Monitoring Results to Evaluate Effectiveness

Results of the performance measures are analyzed to determine if the goals of the Program and A/A actions are being achieved. The Company has established the baseline for comparison as the beginning of the effective date of this Plan. Subsequent data will be collected on a calendar year basis by March 31st of each year.

Trends are monitored over time by General Office Engineering to ensure they are moving in the appropriate direction based on the measure being evaluated. Deviations from expected trend performance are analyzed and a determination is made as to whether it is caused by an isolated occurrence or representative of the fact that the A/A action is no longer productive. Results of the analyses will dictate whether the A/A actions should be continued, modified or replaced with another risk management tool. Long term improvement is desired and trends considered abnormal may be ignored when deemed by General Office Engineering as appropriate to the circumstances.

7.0 PERIODIC EVALUATION AND IMPROVEMENT OF THE PROGRAM [§192.1007 (F)]

7.1 Review of Written Plan

General Office (GO) Engineering will review the written Plan and make updates or revisions as needed in its content at least every five years from the date of previous review. This review will normally occur in the first quarter of the review year, there will be a creation date and a review date.

Starting the calendar year following effective date of this Plan (2012), appropriate GO Engineering personnel from each operating Company under this Plan will meet every four (4) years to complete a review of the Program and written Plan. The review will be documented using Form 21761 – *DIMP Review Summary* and shall be retained in Appendix C.

7.2 Revisions to the Written Plan

If changes or modifications to the Plan document are made, a record of that change or modification will be noted on the revision control sheet. The revision number will only change if a revision takes place. The Plan document will also be updated whenever substantive changes to the risk model are implemented. These could include redefining facility groups or altering schedules. The revision number and date of the Plan will be changed. A summary of the modifications will be kept in Appendix C using Form 21761.

Changes made to this plan will be relayed to the appropriate field personnel for dissemination to their staff for implementation. If required, the local State regulating authority will be notified and/or furnished with an updated version of the Plan document.

7.3 Program Improvement

Improvement of the Plan is made based primarily on the results of the risk management technique or practice. During the review, data that supports the performance of these actions should be collected and analyzed. Analysis may range from simple side-by-side comparisons to sophisticated statistical data processing. The frequency of this review is not pre-set but will be within five years of the prior results evaluation or revision. The frequency depends on an appropriate time frame for which meaningful results can be recorded. For example damage prevention methods may show results within a season where corrosion control enhancements may not provide measurable improvement for many years.

These reviews will also be used to determine if additional information about the distribution system is needed or would help identify areas for improvement. When such needs are identified, Company will design and institute enhanced information collection activities as described in Section 2.5.5.

Program improvements may include modification of facility groups, adjustment of likelihood or consequence factors, selection of different A/A actions, or determination of additional or alternative performance measures. Overall effectiveness of integrity management in reducing risks is the governing principle.

8.0 MECHANICAL COUPLING FAILURE REPORTING [§192.1009]

8.1 Overview

The Company reports failures resulting in hazardous leaks (as defined in Section 5.2.2.2) of mechanical couplings that are in service in its distribution system at the time of the failure. The Company has enhanced Procedure 3370 – Material and/or Component Failures to ensure mechanical couplings that fail are identified and reported as required.

8.2 Reporting

All failures of any in-service mechanical coupling are reported to General Office Engineering. When it can be done through normal repair or replacement procedures, the failed mechanical coupling is collected and retained for examination. As much of the information listed in Section 8.2.1 is recorded at the time of the coupling failure and sent along with the specimen. Required information not collected during the time of failure shall be obtained by General Office Engineering through further investigation.

8.2.1 Minimum Required Reportable Information

The following information is required at a minimum for mechanical fitting failures:

- Location of the failure in the system
- Nominal pipe size
- Material type (of coupling body)
- Nature of failure including contribution of local pipeline environment [soil type, contaminants]
- Coupling manufacturer
- Model number
- Lot number
- Decade of manufacture
- Other information that can be found in markings on the failed coupling

8.2.2 Additional Failure Information

Additional information collected for a mechanical fitting failure may include but is not limited to the following:

- Location of failure on the specimen (e.g., body, gasket, threads or bolts) . Date of installation
- MAOP
- Operating pressure at time of failure
- Normal annual operating pressure range

8.3 Failure Analysis

The information listed in Sections 8.2.1 and 8.2.2 is reviewed by General Office Engineering and collected by calendar year for inclusion in the annual report to DOT. At the end of reporting period, G.O. Engineering analyzes the data for the year, determines the number of similar failures for each failure reported and includes that information on the annual report. A "similar failure" is identified when one or more of the Minimum Required reportable Information items is the same and applies only to the current calendar year data. A copy of the annual report is sent to the pipeline safety office of the State in which the failure occurred.

Except for isolated cases, the Company uses the results of the analysis as a factor in its periodic updates of threat and risk analysis. When higher or shifted relative risk is determined, the appropriate sections of the Plan are implemented.

9.0 PERIODIC REPORTS TO GOVERNMENT AGENCIES [§192.1007 (E)]

9.1 Federal

The Company reports the following information to the Pipeline and Hazardous Materials Safety Administration annually by March 15th of each year. These data represent occurrences within the previous calendar year and are part of the annual report submitted by the company to PHMSA. Statistics are recorded separately by state and Company to facilitate reporting under Section 9.2 of this Plan. For operating Companies that have facilities in multiple states, one annual report will be submitted to DOT covering all Company facilities.

- Number of hazardous leaks (as defined in Section 5.2.2.2) either eliminated or repaired, categorized by cause
- Number of excavation damages
- Number of excavation notification tickets received from all operation state's one call centers listed in Table 9.1

Table 9.1: Company One Call Centers

State	Locate Ticket Center	Contact Information
Idaho	Dig Line, Inc.	Office: (208) 342-1585
Minnesota	Korpartner, Inc.	Office: (952) 368-1911
Montana	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
Oregon	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
North Dakota	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
South Dakota	Korpartner, Inc.	Office: (952) 368-1911
Washington	One Call Concepts, Inc.	Office: (503) 232-1987 Fax: (503) 234-7254
Wyoming	Password, Inc.	Office: (509) 624-5235

- Total number of leaks either eliminated or repaired, categorized by cause. This total number does not include leaks that are being monitored pending future action.
- Mechanical fitting failure data

9.2 Submitting Reports

Reports will be submitted by one of the following methods:

- Via the internet to the PHMSA on-line reporting system which is accessible through the PHMSA home page at:

  http://phmsa.dot.gov

  or

- By facsimile to:

  202-493-2311

  or

- Through US mail to:

  Pipeline and Hazardous Materials Safety Administration
  Information Resource Manager
  US Department of Transportation-East Building
  1200 New Jersey Avenue, SE
  Washington, DC 20590

9.3 State Agency(s)

Annual counts of reportable items listed in Sec. 9.1 for the appropriate state are sent annually by March 15th of each year to the states of South Dakota, Minnesota, North Dakota, Wyoming, Washington, Idaho, Oregon, and Montana regulatory agency.

Table 9.2: State Agency Contact Information

State	State Agency Website Address	Contact Information
Idaho	http://www.puc.state.id.us/	1-208-334-0300
Minnesota	http://www.puc.state.mt.us/puc	1-800-422-0798
Montana	http://psc.mt.gov	1-406-444-6199
Oregon	http://www.oregon.gov/PUC/	1-503-373-7394
North Dakota	http://www.psc.nd.gov	1-701-328-2400
South Dakota	http://www.puc.sd.gov	1-605-773-3201
Washington	http://www.utc.wa.gov	1-360-664-1234
Wyoming	http://psc.state.wy.us	1-307-777-7427

10.0 RECORDKEEPING [§192.1011]

10.1 Overview

The Company maintains records sufficient to display compliance with CFR 49, Part 192 Subpart P. Such records are retained for a minimum of ten (10) calendar years from the year in which they are produced. Records to be retained include:

- Written Plan
  - Current version of the Plan
  - Past revisions of the Plan
  - Description of significant changes between versions
  - Reason each significant change was made
- Likelihood and consequence factors
  - Any supporting documentation used to determine the factors (e.g. construction and maintenance records, SME input, industry data, etc.)
- Outside source data and related information in Appendix D
- Risk management activities implemented as a result of the Program
- Performance measure results and analysis
- Appropriate documentation produced if deviations from required periodic inspections are requested
- Other applicable reports to PHMSA or local State regulatory agency

11.0 DEVIATIONS FROM PART 192-MANDATED PERIODIC INSPECTIONS [§192.1013)]

11.1 Overview

Company reviews the risk evaluation results and the effects of implemented risk management practices for positive influences toward the reduction of risk on its distribution system. Improvements may encourage the Company to decide that a reduction in the frequency of one or more inspections or tests required by Part 192, when accompanied by appropriate actions under this Plan, will provide an equal or greater overall level of safety of its distribution system.

In such a case, an analysis is made that includes a description of safety improvement afforded by applicable risk management measure(s), the reason(s) why a particular inspection or test is selected for a reduced frequency of performance, how the resources thus available are used to mitigate risk in other areas and a demonstration through risk evaluation as described in Section 6.0 of the Plan that risk values are not compromised.

11.2 Documentation

A proposal, similar in format to a waiver request is then submitted to the pipeline safety authority of the state in which the proposal is requested. Appropriate follow-up data are provided when requested.

The Company reviews any conditions or limitations that are associated with acceptance of the proposal. If they are acceptable, the Company begins implementation of the revised frequency schedules through the following:

- Revision of appropriate O & M procedures
- Notification and training of affected personnel and/or contractors
- If necessary under its OQ plan, revising evaluations for Operator Qualification for those tasks
- Performing re-evaluations when required
- Monitoring distribution integrity management performance measures

APPENDIX A
FORMS

FORM LINKS

21760 – Additional or Accelerated Action Implementation

21761 – DIMP Review Summary

21762 – Subject Matter Expert Interview/Input

21763 – GIS Validation

APPENDIX B
DIMP MODEL CALCULATIONS

MODEL CALCULATION LINKS

CNGC MODEL CALCULATIONS

IGC MODEL CALCULATIONS

MDU MODEL CALCULATIONS

APPENDIX C
PLAN REVISION SUMMARY

APPENDIX D
OUTSIDE SOURCE DATA

Outside Source Data used in IGC DIMP Model

Data	Geographic Coverage	Source Agency	Source Type	Source Format	Source/URL	DIMP Risk Category
Atmospheric Corrosion	IGC Operating Region	IGC			Customer Watch Database	Corrosion
Line Locates	Idaho	Dig Line, Inc.		Access Database	Service Link	Excavation
Flood Zones	By County/Idaho	Idaho Dept. of Water Resources	Digital Flood Insurance Rate Maps (DFIRMS)	shape file	http://www.idwr.idaho.gov/ftp/gisdata/Spatial/FloodPlainManagement/DFIRM/	Natural Forces
Flood Zones	By County/Idaho	Idaho Dept. of Water Resources	Digital Q3 Flood Data	shape file	http://www.idwr.idaho.gov/ftp/gisdata/Spatial/FloodPlainManagement/FEMAFloodHazardAreas/	Natural Forces
Flood Zones	By County/Oregon	University of Oregon	Digital Q3 Flood Data	DLG, ARC/INFO, MapInfo	http://libweb.uoregon.edu/map/gis_data/fema.html	Natural Forces
Flood Zones	By County/Washington	Washington Dept. of Ecology	DFIRMS, Digital Q3 Flood Data	zip file/shape file	http://www.ecy.wa.gov/services/gis/data/flood/flood.htm	Natural Forces
Lakes/Rivers/Canals	Idaho	Idaho Dept. of Water Resources	Hydrography Dataset	shape file	http://www.idwr.idaho.gov/GeographicInfo/GISdata/hydrography.htm	Natural Forces
Oceans/Lakes/Rivers/Creeks	Oregon/Washington	BLM	Hydrography Publication Dataset	zip file/gdb	http://www.blm.gov/or/gis/data.php	Natural Forces
Wild Fires	Nationwide	USDA Forest Service	MODIS Fire Detection Data	zip file/shape file	http://activefiremaps.fs.fed.us/gisdata.php	Natural Forces
Railroad Network	Nationwide	ESRI		ESRI data layer	ESRI Data & Maps DVD	Outside Force
Street Data	Nationwide	NAVTEQ	NAVTEQ Street Data	shape file, MapInfo		Outside Force
Census Block Population Data	Nationwide	ESRI		ESRI data layer	ESRI Data & Maps DVD	Consequences
Schools	Nationwide	ESRI	DOE_U.S. Schools	ESRI data layer	http://www.arcgis.com/home/item.html?id=f8cf498555344ef880aa3361239c5abb	Consequences
Hospitals	Nationwide	ESRI		ESRI data layer	ESRI Data & Maps DVD (2009)	Consequences

APPENDIX E
DIMP FACILITY INFORMATION CHANGES