IRVINGTON GAS COMPANY
PROPANE

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May 8, 2013

Jeff Derouen
Executive Director
Public Service Commission
PO Box 615
Frankfort, KY 40602

The information attached is in response to case #2013-00038. The enclosed information is 99% complete except for a digital copy of an addition to one subdivision and the Operations and Maintenance manual (Dimp). Therefore, Irvington Gas requested an extension of time to complete till June 1st for the remaining data.

Sincerely

Kerry R Kasey
President

DISTRIBUTION INTEGRITY MANAGEMENT PLAN

For Propane Subdivisons

401 S First Street
Irvington, Kentucky 40146

Generated Date: 2013-05-15
Version: 2.1.1
Effective Date: 2013-06-01
Replaces Version: none
Effective: (No Prior Plan)

Table of Contents

Revisions

Table 1. Plan Version History

Plan Version	Program Version	Date	By User	Notes
2.1.1	2.1.8	2013-05-15	KKasey2	new plan

Table 2. SHRIMP Version History

Program Version	Date	Notes
2.1.8	2013-04-25	Modified Threat Assessment wording. Added capability for referencing external sources of information.
2.1.7	2013-02-25	May choose from multiple Plan Years. Detects leak trend changes when Plan Year changed. Updated Relative Risk Model description.
2.1.6	2013-01-02	Data for 2012 may now be entered.
2.1.5	2012-12-13	Corrects crashes due to cetain revision notes; Shows plan type (preview or final) in list of Written Plans.
2.1.4	2012-12-02	Corrects prior plan effective date; interview end during review or correct modes; required settings.
2.1.3	2012-11-28	Fix problem with editable areas when using "Correct" mode.
2.1.2	2012-11-18	SHRIMP update adding New Leaks mode and new Required Settings.
2.1.1	2012-04-24	Initial release of SHRIMP with full DIMP version tracking and revisions.
1.1.31	2012-04-24	All versions of SHRIMP prior to the incorporation of version tracking.

Chapter 1. SCOPE

This document is the distribution integrity management plan (Plan) for Propane Subdivisons. It is intended to meet the requirements of 49 CFR Part 192, Subpart P Distribution Integrity Management Programs (DIMP).

This Plan covers the LP-Gas system of Propane Subdivisons.

This Plan is effective on 2013-06-01.

This Plan is Version 2.1.1.

This Plan replaces Version none.

This Plan is based on data for the Plan Year ending 2012.

The following people are responsible for ensuring that the requirements of this Plan are carried out:

Table 1.1. Responsible Parties

Name and/or Job Title	Responsible For
Kerry Kasey, President	All

In addition, assignments for implementing action items found in this Plan are listed in Section 11.1, "IMPLEMENTATION PLAN".

Chapter 2. DEFINITIONS

Excavation damage

Any impact that results in the need to repair or replace an underground facility due to a weakening, or the partial or complete destruction, of the facility, including, but not limited to, the protective coating, lateral support, cathodic protection or the housing for the line device or facility.

Excavation ticket

All receipts of information by the operator from the ONE-CALL notification center requesting marking of the location of gas pipeline facilities.

Hazardous Leak

A 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. Examples include:

- Escaping gas that has ignited.

- Any indication of gas which has migrated into or under a building, or into a tunnel,
- Any reading at the outside wall of a building, or where gas would likely migrate to an outside wall of a building,
- Any reading of 80% LEL, or greater, in a confined space,
- Any reading of 80% LEL, or greater in small substructures (other than gas associated substructures) from which gas would likely migrate to the outside wall of a building,
- Any leak that can be seen, heard, or felt, and which is in a location that may endanger the general public or property, or
- Any leak which, in the judgment of operating personnel at the scene, is regarded as an immediate hazard.

Chapter 3. KNOWLEDGE OF THE DISTRIBUTION SYSTEM

This Plan was developed based on the design, construction, operation and maintenance records of Propane Subdivisons, 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 Propane Subdivisons' employees. The specific elements of knowledge of the infrastructure used to evaluate each threat and prioritize risks are listed in Chapter 4, THREAT ASSESSMENT, Chapter 5, RISK EVALUATION AND PRIORITIZATION and Section 11.2, "LIST OF ANSWERS AND DATA SOURCES FROM SHRIMP™ INTERVIEWS" of this Plan. Section 11.2, "LIST OF ANSWERS AND DATA SOURCES FROM SHRIMP™ INTERVIEWS" also lists the data sources used to answer each question.

Any additional information needed and the plan for gaining this currently unknown information over time through normal activities is described in Section 11.1, "IMPLEMENTATION PLAN".

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".

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 Propane Subdivisons. This will include the location where new piping and appurtenances are installed and the material of which they are constructed. The manner in which this will be accomplished is described in Section 11.1, "IMPLEMENTATION PLAN".

Chapter 4. THREAT ASSESSMENT

4.1. Overview

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. Answers to all questions asked by SHRIMP and the data sources for those answers is found in Section 11.2, "LIST OF ANSWERS AND DATA SOURCES FROM SHRIMP™ INTERVIEWS".

In addition to Propane Subdivisons's own information, data from the following external sources were used to assist in identifying potential threats:

- PHMSA advisory bulletins, regulatory updates and other integrity management information sent to SHRIMP subscribers by the APGA Security and Integrity Foundation;
- PHMSA Annual and Incident Report data, used in calculating the incident probability factor in the risk ranking model, described in more detail in Section 11.3.2, "Relative Risk Model".
- Data on leak repair rates, excavation damages per 1000 locate tickets and other aggregated data from all SHRIMP users provided by the APGA SIF to SHRIMP subscribers
- Information provided through membership and/or active participation in the following organizations:
    - Kentucky Gas Association

4.2. Propane Subdivisons Threat Assessment

4.2.1. Corrosion

Atmospheric Corrosion

Atmospheric corrosion 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 have not required repair over the past 5 years.
- 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:

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

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

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

- neither metal mains and services nor plastic mains and services with metal fittings are present.

4.2.2. Equipment Malfunctions

Equipment Malfunctions

Equipment malfunctions 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).

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.

Excavation Damage Due To Third Party Damages

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

- Excavation damages have not occurred due to third parties during the past few years.

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.

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).

4.2.5. Materials, Welds and Joints

Material, Weld Or Joint

Material, weld or joint 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.

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.

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

Natural forces 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

Other outside forces 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.

4.2.8. Other threats

Other Threats

Other threats 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.

Chapter 5. RISK EVALUATION AND PRIORITIZATION

5.1. Overview

Of the sections identified during the Threat Assessment as requiring further consideration for additional actions, Propane Subdivisons 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.

RANK indicates the final relative risk rank after review and validation by Propane Subdivisons.

USER RANK indicates if the threat-segment was re-ranked by Propane Subdivisons. A zero indicates it was left where SHRIMP's risk model ranked it – any other number indicates it was moved higher or lower by Propane Subdivisons. Where a threst-segment was re-ranked an explanation for the reason is included in the discussion for that segment.

SHRIMP Rank is where SHRIMP's risk ranking model originally ranked the threat-segment. Segments under Other Threats were not ranked by SHRIMP so are initially placed at the bottom of the segment list. Propane Subdivisons has placed these segments in the risk ranking list based in its knowledge and judgment.

Relative Risk score is a numeric score from 0-30 based on the four factors listed – Probability, Consequence, Leak Cause Factor and Incident Probability Factor. The risk model is described in detail in Section 11.3.2, "Relative Risk Model".

The risk ranking is based on relative risk, not absolute risk. It should not be construed to suggest that the highest ranked segment is unsafe or that additional actions are required to maintain public safety. It is merely a tool to assist Propane Subdivisons to prioritize its inspection and maintenance programs.

5.2. Propane Subdivisons Section Risk Ranking

No threat risk sections are prescribed in this Plan.

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

None Required For Small LP Piping System (Fewer than 100 customers from a single source) System.

LEAK LOCATION PROCEDURE(S)

None Required For Small LP Piping System (Fewer than 100 customers from a single source) System.

6.2. RISK BASED ADDITIONAL ACTIONS

The following lists the additional/accelerated actions that will be taken and describes the part of Propane Subdivisons to which each applies to address the priority risks described in the previous section of this Plan. Further details can be found in Section 11.1, "IMPLEMENTATION PLAN".

No threat risk sections are prescribed in this Plan.

Chapter 7. MEASURE PERFORMANCE, MONITOR RESULTS AND EVALUATE EFFECTIVENESS

7.1. MANDATORY PERFORMANCE MEASURES

Propane Subdivisons will monitor, as a performance measure, the number of leaks eliminated or repaired on its pipeline and their causes.

7.2. RISK BASED PERFORMANCE MEASURES

Risk based performance measures are not required for Small LP Piping System (Fewer than 100 customers from a single source) system.

7.3. MONITOR RESULTS AND EVALUATE EFFECTIVENESS

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

Chapter 8. PERIODIC EVALUATION AND IMPROVEMENT

Propane Subdivisons will conduct a complete re-evaluation of this Plan no less than every 1 year. Trends in each of the performance measures listed in Chapter 7, MEASURE PERFORMANCE, MONITOR RESULTS AND EVALUATE EFFECTIVENESS 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, Propane Subdivisons will consider implementing additional actions to address that risk.

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.

Chapter 9. REPORTING

None Required For Small LP Piping System (Fewer than 100 customers from a single source) System.

Chapter 10. RECORD KEEPING

The following records will 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. Inspection, maintenance and other records relied upon in developing this written DIMP plan, as listed in the Data Source fields in Section 11.2, "LIST OF ANSWERS AND DATA SOURCES FROM SHRIMP™ INTERVIEWS" of this Plan.

Chapter 11. ATTACHMENTS

11.1. IMPLEMENTATION PLAN

This Attachment lists all the action items that are included in this written Distribution Integrity Management Plan.

Section A describes how Propane Subdivisons will modify procedures, policies and/or recordkeeping systems to implement:

1. mandatory data collection and recordkeeping requirements in the regulation as listed in Section 7.1, "MANDATORY PERFORMANCE MEASURES" of this Plan, and
2. performance measures specific to Additional/Accelerated Actions as listed in Section 7.2, "RISK BASED PERFORMANCE MEASURES" of this Plan.

Section B describes how Propane Subdivisons will implement Additional/Accelerated Actions, if any, listed in Chapter 6, ADDITIONAL/ACCELERATED MEASURES TO ADDRESS RISKS of this Plan.

Section C describes how Propane Subdivisons will implement procedures to collect additional information needed to fill gaps, if any, found during the development of this Plan.

A. Procedures, policies and/or recordkeeping systems will be modified as follows to collect and retain information required to be collected and retained under the DIMP plan, including:

   1. The following Recordkeeping tasks:

      a. Records for all piping system installed after the effective date of this Plan, including, at minimum, the location where new piping and appurtenances are installed and the material of which they are constructed.

         Propane Subdivisons will implement as follows:

         Kerry Kasey, President – upon completion

   2. The following mandatory Performance Measures:

      a. Number of leaks either eliminated or repaired, categorized by the following causes:

         - Corrosion
         - Excavation
         - Natural Forces
         - Other Outside Force
         - Inappropriate Operations
         - Material, Weld or Joint Failure
         - Equipment Malfunction
         - Other Causes

         Propane Subdivisons will implement as follows:

         Kerry Kasey, President – within 24 hours

   3. The following threat specific Performance Measures (presented by section in risk rank order):

Not required for Small LP Piping System (Fewer than 100 customers from a single source) system.

B. Additional/Accelerated Actions included in this DIMP plan:

1. The following mandatory Accelerated/Additional Actions:

   a. Leak classification and action criteria as chosen and described in Section 6.1, "MANDATORY ADDITIONAL ACTIONS" of this Plan.

      Propane Subdivisons will implement as follows:

      Kerry Kasey, President all leaks will be inspected within 24 hours

2. The following threat specific Additional/Accelerated Actions (presented by section in risk rank order):

   No risk-based additional/accelerated actions are prescribed in this Plan.

C. The following Procedures to collect additional information needed to fill gaps:

   a. The following gaps identified by Propane Subdivisons.

      Propane Subdivisons will implement as follows:

      No additional information needed.

11.2. LIST OF ANSWERS AND DATA SOURCES FROM SHRIMP™ INTERVIEWS

The following lists the interview responses and data sources entered during the threat assessments.

Corrosion Threat

- *Corrosion (CORR) (Propane Subdivisons - LP-Gas system)*
  - Interview Start (CORR)

    Data Source:

    System is all plastic

    Your Choice (weight: 0) --Continue

  - How many leak repairs resulting from corrosion occurred during the years shown? (CORR-Leak)

    Your Choice (weight: 0) --

    Table 11.1. Leak Repairs From PHMSA 7100.1-1

	Corrosion		Totals	
End of Year	Mains	Services	Mains	Services
In 2008	0	0	0	0
In 2009	0	0	0	0
In 2010	0	0	0	0
In 2011	0	0	0	0
In 2012	0	0	0	0

  - Review/Edit the data or Keep as is.

    Review The Guidance and Choose (ECMETALNO)

    Your Choice (weight: 0) --Keep

  - Review/Edit the data or Keep as is.

    Review The Guidance and Choose (ECPLASYES)

    Your Choice (weight: 0) --Keep

- Does your plastic system contain isolated metallic fittings? (EC110)

  Your Choice (weight: 0) --No

- Provide Additional Information (EC101b)

  Your Choice (weight: 0) --

  - Atmospheric Corrosion (CORRAC) (Propane Subdivisons - LP-Gas system)
    - Interview Start (CORRAC)

      Your Choice (weight: 0) --Continue

    - Does Propane Subdivisons have any facilities that require atmospheric corrosion inspections? (CORRAC101)

      Your Choice (weight: 0) --Yes

    - Over the past 5 years, have any atmospheric corrosion inspections found metal loss due to atmospheric corrosion? (CORRAC103)

      Your Choice (weight: 0) --No

    - Over the past 5 years, have leaks caused by atmospheric corrosion required repair? (CORRAC104)

      Your Choice (weight: 0) --No

    - Have inspections found problems with above ground pipe coatings that could not be fixed by routine maintenance? (CORRAC105)

      Your Choice (weight: 0) --No

    - Confirm that no other atmospheric corrosion problems are known. (CORRAC204b)

      Your Choice (weight: 0) --Accept

Equipment Malfunction Threat

- Equipment Malfunction (EQIP) (Propane Subdivisons - LP-Gas system)
  - Interview Start (EQIP)

    Your Choice (weight: 0) --Continue

  - How many leak repairs resulting from equipment problems occurred during the years shown? (EQIP-Leak)

    Your Choice (weight: 0) --

Table 11.2. Leak Repairs From PHMSA 7100.1-1

	Equipment Malfunction		Totals	
End of Year	Mains	Services	Mains	Services
In 2008	0	0	0	0

In 2009	0	0	0	0
In 2010	0	0	0	0
In 2011	0	0	0	0
In 2012	0	0	0	0

- Are leaks occurring or do inspections indicate potential equipment malfunctions? (EQ101a)

  Your Choice (weight: 0) --

  None of These

- Does system contain equipment known/prone to malfunction (Industry wide)? (EQ102a)

  Your Choice (weight: 0) --

  None of These

- Confirm that no other equipment problems are known. (EQ204)

  Your Choice (weight: 0) --Accept

Incorrect Operations Threat

- Incorrect Operations (IOP) (Propane Subdivisons - LP-Gas system)
  - Interview Start (IOP)

    Your Choice (weight: 0) --Continue

  - How many leak repairs resulting from incorrect operations occurred during the years shown? (IOP-Leak)

    Your Choice (weight: 0) --

    Table 11.3. Leak Repairs From PHMSA 7100.1-1

	Incorrect Operations		Totals	
End of Year	Mains	Services	Mains	Services
In 2008	0	0	0	0
In 2009	0	0	0	0
In 2010	0	0	0	0
In 2011	0	0	0	0
In 2012	0	0	0	0

  - Have failures due to inadequate procedures been experienced during the past 5 years? (IOP101)

    Your Choice (weight: 0) --No

  - Have failures due to a failure to follow procedures been experienced? (IOP104)

    Your Choice (weight: 0) --No

  - Have any employees or contractors had operator qualification credentials revoked due to poor performance of any covered task? (IOP105)

    Your Choice (weight: 0) --No

- Have employees or contractors tested positive for drugs or alcohol (other than pre-hire tests)? (IOP106)

  Your Choice (weight: 0) --No

- Confirm that no other incorrect operations problems are known. (IOP204)

  Your Choice (weight: 0) --Accept

Material, Weld or Joint Failure Threat

- Material, Weld or Joint Failure (MW) (Propane Subdivisons - LP-Gas system)
  - Interview Start (MW)

    Your Choice (weight: 0) --Continue

  - How many leak repairs resulting from material, weld or joint problems occurred during the years shown? (MW-Leak)

    Your Choice (weight: 0) --

    Table 11.4. Leak Repairs From PHMSA 7100.1-1

	Material, Weld or Joint Failure		Totals	
End of Year	Mains	Services	Mains	Services
In 2008	0	0	0	0
In 2009	0	0	0	0
In 2010	0	0	0	0
In 2011	0	0	0	0
In 2012	0	0	0	0

  - Have manufacturing defects on pipe or non-pipe components been experienced? (MW101)

    Your Choice (weight: 0) --No

  - Have failures due to workmanship defects been experienced? (MW102)

    Your Choice (weight: 0) --No

  - Do any of the following materials exist on the system? (MW103)

    Your Choice (weight: 0) --

    None of These

  - Confirm that no other material, weld or joint problems are known. (MW204)

    Your Choice (weight: 0) --Accept

Excavation Damage Threat

- Excavation Damage (OFEXC) (Propane Subdivisons - LP-Gas system)
  - Interview Start (OFEXC)

    Your Choice (weight: 0) --Continue

- Does your system participate in a qualified one-call system (see 192.614)? (OFEXC101)

  Your Choice (weight: 0) --Yes

- Which system do you do you use? (OFEXC102)

  Your Choice (weight: 0) --Kentucky-Kentucky 811

- Are you a Master Meter Operator? (OFEXC103)

  Your Choice (weight: 0) --No

- Do you physically control access to your pipeline location? (OFEXC104)

  Your Choice (weight: 0) --Yes

- How many excavation leak repairs occurred during the years shown? (OFEXC105)

  Your Choice (weight: 0) --

  Table 11.5. Leak Repairs From PHMSA 7100.1-1

	Excavation Damage		Totals	
End of Year	Mains	Services	Mains	Services
In 2008	0	0	0	0
In 2009	0	0	0	0
In 2010	0	0	0	0
In 2011	0	0	0	0
In 2012	0	0	0	0

- How many excavation caused damages not resulting in leaks reported on the PHMSA 7100.1-1 form have occurred during the years shown? (OFEXC105a)

  Your Choice (weight: 0) --

  Table 11.6. End of Year

	Mains	Services
In 2008	0	0
In 2009	0	0
In 2010	0	0
In 2011	0	0
In 2012	0	0

- How many excavation tickets (receipt of information by the underground facility operator from the one-call system) were received during the years shown? (OFEXC106)

  Your Choice (weight: 0) --

  Table 11.7. End of Year

	Damages Previously Entered	Excavation Tickets	Damages Per 1000 Tickets
In 2008	0	0	0
In 2009	0	0	0
In 2010	0	0	0
In 2011	0	0	0
In 2012	0	0	0

- SHRIMP has determined that leaks, failures or damages are not increasing.(see guidance).

  Do you accept this determination? (OFEXC106bok)

  Your Choice (weight: 0) –Accept

- Your data and choices indicate that excavation damages per 1000 tickets are not increasing. (OFEXC106b)

  Your Choice (weight: 0) –Continue

- Provide Additional Information (OFEXC106e)

  Your Choice (weight: 0) –

  - Blasting Damage (OFEXC-Blast) (Propane Subdivisons - LP-Gas system)
    - Interview Start (OFEXC-Blast)

      Your Choice (weight: 0) –Continue

    - Has damage occurred due to blasting? (OFEXC137)

      Your Choice (weight: 0) –No

    - Are there portions of the system located where excavation in the area of pipeline would require the use of explosives? (OFEXC135)

      Your Choice (weight: 0) –No

    - Are there portions of the system in known areas of blasting or demolition activity, such as rock quarries or coal mining? (OFEXC136)

      Your Choice (weight: 0) –No

    - Confirm that no other excavation problems are known. (OFEXC204)

      Your Choice (weight: 0) –Accept

  - Concentrated Damages (OFEXC-Conc) (Propane Subdivisons - LP-Gas system)
    - Interview Start (OFEXC-Conc)

      Your Choice (weight: 0) –Continue

    - You previously entered this information regarding excavation damages and tickets during the years shown.

      Click Next to proceed. (OFEXC206)

      Your Choice (weight: 0) –

Table 11.8. End of Year

	Damages Previously Entered	Excavation Tickets Previously Entered	Damages Per 1000 Tickets
In 2008	0	0	0
In 2009	0	0	0
In 2010	0	0	0
In 2011	0	0	0

In 2012	0	0	0

- Are these excavation damages concentrated in certain locations or distributed across the entire system? (OFEXC207)

  Data Source:

  No Excavation damages

  Your Choice (weight: 0) --Distributed across the entire system

- Are these *locate tickets concentrated in certain locations* or distributed across the entire system? (OFEXC208)

  Your Choice (weight: 0) --Distributed across the entire system

- Confirm that no other excavation problems are known. (OFEXC204)

  Your Choice (weight: 0) --Accept

- Crew or Contractor Damages (OFEXC-Crew) (Propane Subdivisons - LP-Gas system)
  - Interview Start (OFEXC-Crew)

    Your Choice (weight: 0) --Continue

  - Has excavation damage been caused by your crews or your contractors? (OFEXC115)

    Your Choice (weight: 0) --No

  - Confirm that no other excavation problems are known. (OFEXC204)

    Your Choice (weight: 0) --Accept

- Third Party Damages (OFEXC-Third) (Propane Subdivisons - LP-Gas system)
  - Interview Start (OFEXC-Third)

    Your Choice (weight: 0) --Continue

  - During the past few years, have excavation damages occurred due to third parties? (OFEXC127)

    Your Choice (weight: 0) --No

  - Confirm that no other excavation problems are known. (OFEXC204)

    Your Choice (weight: 0) --Accept

Natural Forces Threat

- Natural Forces (OFNF) (Propane Subdivisons - LP-Gas system)
  - Interview Start (OFNF)

    Your Choice (weight: 0) --Continue

- Do leaks repaired per year average one (1) or more? (OFNF101rp)

  Your Choice (weight: 0) --

Table 11.9. Leak Repairs From PHMSA 7100.1-1

	Natural Forces		Totals	
End of Year	Mains	Services	Mains	Services
In 2008	0	0	0	0
In 2009	0	0	0	0
In 2010	0	0	0	0
In 2011	0	0	0	0
In 2012	0	0	0	0

- How many natural forces damages not resulting in leaks reported on the PHMSA 7100.1-1 form have occurred during the years shown? (OFNF101nr)

  Your Choice (weight: 0) --

Table 11.10. End of Year

	Mains	Services
In 2008	0	0
In 2009	0	0
In 2010	0	0
In 2011	0	0
In 2012	0	0

- Here is a summary of your natural forces damages during the years shown.

  Click Next to Continue. (OFNF101)

  Your Choice (weight: 0) --

Table 11.11. End of Year

	Leak Repairs	Damages Not Reported	Total
In 2008	0	0	0
In 2009	0	0	0
In 2010	0	0	0
In 2011	0	0	0
In 2012	0	0	0

- SHRIMP has determined that leaks, failures or damages are not averaging one (1) or more per year.(see guidance).

  Do you accept this determination? (OFNF101bok)

  Your Choice (weight: 0) --Accept

- Your data and choices indicate that leaks, failures or damages are not averaging one (1) or more per year. (OFNF101b)

  Your Choice (weight: 0) --Continue

- Confirm that no natural force problems are known. (OFNF204)

  Your Choice (weight: 0) --Accept

Other Outside Forces Threat

- Other Outside Forces (OFOTHR) (Propane Subdivisons - LP-Gas system)
  - Interview Start (OFOTHR)

    Your Choice (weight: 0) –Continue

  - Do leaks repaired per year average one (1) or more? (OFOTHR101rp)

    Your Choice (weight: 0) –

    Table 11.12. Leak Repairs From PHMSA 7100.1-1

	Other Outside Forces		Totals	
End of Year	Mains	Services	Mains	Services
In 2008	0	0	0	0
In 2009	0	0	0	0
In 2010	0	0	0	0
In 2011	0	0	0	0
In 2012	0	0	0	0

  - How many other outside forces damages not resulting in leaks reported on the PHMSA 7100.1-1 form have occurred during the years shown? (OFOTHR101nr)

    Your Choice (weight: 0) –

    Table 11.13. End of Year

	Mains	Services
In 2008	0	0
In 2009	0	0
In 2010	0	0
In 2011	0	0
In 2012	0	0

  - Here is a summary of your other outside forces damages during the years shown.

    Click Next to Continue. (OFOTHR101)

    Your Choice (weight: 0) –

    Table 11.14. End of Year

	Leak Repairs	Damages Not Reported	Total
In 2008	0	0	0
In 2009	0	0	0
In 2010	0	0	0
In 2011	0	0	0
In 2012	0	0	0

  - SHRIMP has determined that leaks, failures or damages are not averaging one (1) or more per year.(see guidance).

    Do you accept this determination? (OFOTHR101bok)

    Your Choice (weight: 0) –Accept

  - Your data and choices indicate that leaks, failures or damages are not averaging one (1) or more per year. (OFOTHR101b)

    Your Choice (weight: 0) –Continue

  - Confirm that no other outside force problems are known. (OFOTHR204)

Your Choice (weight: 0) --Accept

Other Threats Threat

- Other Threats (OTHR) (Propane Subdivisons - LP-Gas system)
  - Interview Start (OTHR)

    Your Choice (weight: 0) --Continue

  - Has this system experienced failures or other safety problems due to causes that were not addressed during the evaluation of the other threats? (OTHR101)

    Your Choice (weight: 0) --No

  - You have indicated that there are no other issues to be considered. (OTHR204)

    Your Choice (weight: 0) --Continue

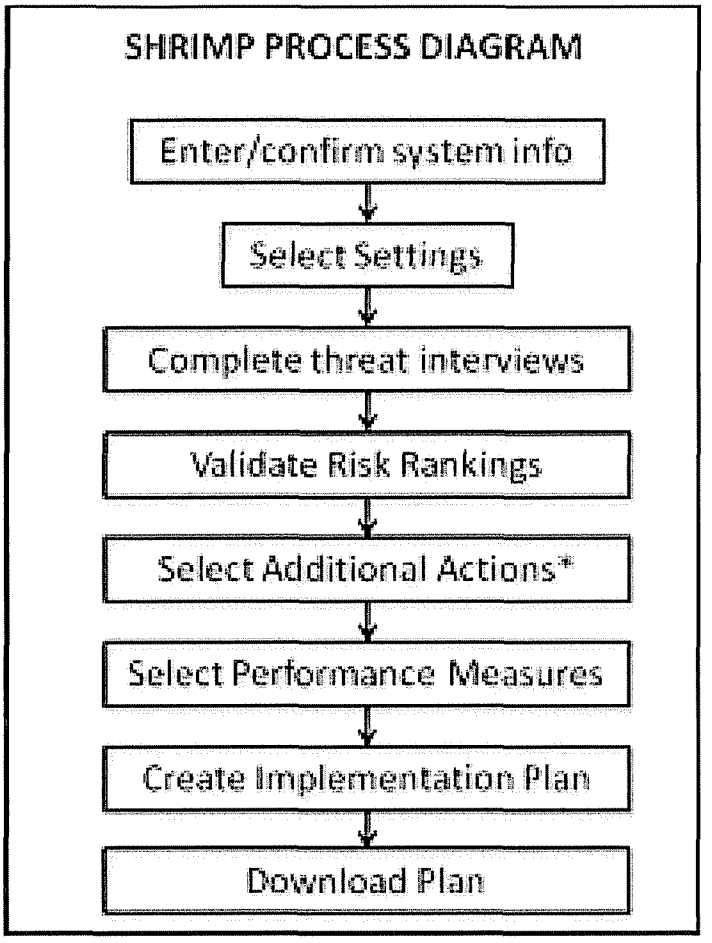
11.3. DESCRIPTION OF THE PROCESS FOLLOWED TO DEVELOP THIS PLAN

11.3.1. Process Description

Procedures for developing and implementing DIMP elements using SHRIMP

Creating a written DIMP Plan using SHRIMP should follow the steps shown in the SHRIMP process diagram. Each step should be completed before moving on to the next step.

Figure 11.1. SHRIMP Process Diagram



1. Enter/confirm system information

   If your system filed a Distribution Annual Report (Form 7100.1-1) you should find your system data already entered into SHRIMP. Note, this may not be the most current data – at the time SHRIMP was created only the annual reports for 2009 were available. This information is shown only to allow you to confirm that this is your system – it is not used for any other purpose in SHRIMP.

   If your annual report data is not already entered in SHRIMP, e.g. you are a master meter or LP piping system operator that is not required to file annual reports, or your annual report is missing from PHMSA's database, you must enter the data manually.

2. Select settings

   The next step is to enter settings for your plan. These include:

   - The name of your system as you want it to appear in the plan,
   - A description of what part of your system this plan covers (default is entire system),
   - The effective date of the plan (for your first plan this should be no later than August 2, 2011 as required by the DIMP rule),
   - The effective date of the DIMP Plan replaced by this Plan – SHRIMP automatically generates this,
   - The History Period – this is how many years back you will enter inspection and maintenance data such as leak repairs, line locate tickets, etc. in the threat interviews. The default and minimum is 5 years and but you can change this to up to 10 years if you have the data. More years data = better DIMP plans.
   - A LEAK management policy – Either select one of the two pre-written options in SHRIMP or if you already have a leak management plan that meets the rule's requirements enter a cross reference to that policy, and
   - A program re-evaluation period, anywhere from 1 to 5 years.

   You can go back and change these at any time by clicking on the Required Settings link in the menu bar on the left side of SHRIMP screens

3. Complete threat interviews

SHRIMP uses an interview process to assess each of the eight threats required by the DIMP rule. The 8 threats are:

1. Corrosion
2. Equipment Malfunction
3. Incorrect Operations
4. Material, Weld or Joint Failure
5. Excavation Damage
6. Natural forces
7. Other outside forces
8. Other Threats

Some of the threats are broken down into two or more subthreats. You must complete each threat and subthreat interview before going to Steps 4 and beyond. You can go back and change any of the information you provide in the threat interviews by clicking on the System Overview link on the menu then clicking on the blue "Review" link next to the threat interview in which you wish to make changes. Select the blue question number link by the question and the interview form will open. Make changes, but you may have to re-complete all of the interview questions after that question if your change affects answers to later questions. This is described in more detail later in this users guide.

> Note
>
> You can complete the first seven threat interviews in any order, however you MUST complete the first seven interviews before attempting to complete the "Other Threats" interview. The answers you provide in the Other Threats interview depend on the answers you provided in the other 7 threat interviews.

The threat interviews are intended to satisfy the following two requirements of the DIMP rule: Section 192.1007 (a) Knowledge and (b) Identify Threats. These requirements and the procedure followed by SHRIMP are further described in an attachment to this document.

4. Validate Risk Rankings

After all 8 threat interviews have been completed SHRIMP will rank each threat and section by relative risk, from highest to lowest, based on a numerical model that considers the likelihood and consequences were a segment of your system to fail due to the threat. A complete description of this risk ranking model is found in an appendix to this user's guide and an attachment to your written DIMP Plan created by SHRIMP.

Click on Risk Ranking in the left menu to open the risk ranking screen. If you entered any threats in the "Other Threats" interview those threats will be listed first with no assigned rank. These threats MUST be manually placed by the user where the user feels these threats belong in the list of threats. The process for that is described in further detail in the risk ranking section of the user's guide. You should not automatically accept SHRIMP's order of risk ranking. Review it, consider the summary description of why SHRIMP ranked each threat and, if you disagree with the order, rearrange the order of threats as you believe it should be, and be sure to enter a description of what factors you considered that led you to change the order. This is a very important step!

The risk ranking validation process is intended to satisfy the following requirement of the DIMP rule: Section 192.1007 (c) Evaluate and rank risk.

5. Select Additional Actions*

After you are satisfied that all threat-sections are ranked in the correct order, the next step is to select additional actions you will undertake to reduce those threats. Additional actions means actions above and beyond what is required by pipeline safety regulations. Other than implementing a leak management program, the DIMP rule does not presume that any further additional actions are necessary. You must decide whether any of the threats pose a level of risk that warrants additional action. SHRIMP cannot make that determination. There is additional guidance on selecting additional actions in the additional actions section of this user's guide.

SHRIMP offers at least one additional action for each threat. Click on the blue Choose AAs link in the Risk Ranking screen to display a list of possible additional actions for that threat. If you decide additional actions are warranted you can select one or more of SHRIMP's additional actions or you can create your own by clicking on the Manage AAs link in the left-side menu in SHRIMP.

This step is intended to satisfy the following requirement of the DIMP rule: Section 192.1007 (d) Identify and implement measures to address risks.

6. Select Performance Measures

The next step is to select performance measures for each of the additional actions you selected in Step 5. If you didn't feel any threats warranted additional actions you can skip this step.

The process of selecting performance measures is identical to selecting additional actions in the prior step. Click on the Choose PMs link then select one or more of the displayed, threat-specific performance measures. You can create your own performance measures

by clicking on Manage PMs in the left-side menu.

This step is intended to satisfy the following requirement of the DIMP rule: Section 192.1007 (e) Measure performance, monitor results and evaluate effectiveness.

7. Create Implementation Plan

   Now you are ready to review the actions required to implement your written DIMP plan. All of the actions required by the rule or selected by you in the additional actions and performance measures steps can be displayed by clicking on "Implementation Plan" in the left-side menu. The Implementation Plan should answer the questions of Who, What, When, Where and How each required action will be accomplished. Action items in your written DIMP Plan can be summarized in the following areas:

   1. Describing how you will modify your procedures, policies and recordkeeping system(s) as necessary to collect and retain information required to be collected and retained under the DIMP plan, including mandatory performance measures and performance measures you selected in the previous step, and

   2. Describing how you will implement any Additional/Accelerated Actions that you included in your written DIMP plan.

   Each action item will be listed separately with a text box in which you must enter a description of how you will accomplish this action.

8. Download your written DIMP Plan

   When you are satisfied that Steps 1-7 are complete you should download your written DIMP plan to your computer. Click on Written Plan in the left-side menu and a list of download options will be displayed.

   Review the Required Settings one more time to ensure your system name appears as you want it to appear in your Plan and that the other information is correct.

   Click on Web Page Format to display the written plan on your web browser. You can do this at any time during the process of creating your plan to see how selections you have made up to that point affect what is written into your plan. It is recommended that you look at the Plan in the Web Page Format frequently as you work on Steps 1-7 to see how data you enter appears in your Plan – it may affect how you write some text that will go into your Plan.

   You may save your plan to your computer as a Web Page using the Save command on your web browser.

   Click on Microsoft WORD Document to download your plan as a WORD file that you can edit using Microsoft WORD or other word processing software. (Note that the translator that creates this file may loses some formatting of the Table of Contents and other portions of the Plan. We apologize for any inconvenience this may cause you. We are evaluating other options for creating WORD files.)

   Click on Adobe PDF Format to download you written Plan as an Adobe PDF file.

SHRIMP Procedures Compared To DIMP Rule Requirements

This section describes the procedures to be followed to develop and implement the 7 required elements of the Distribution Integrity Management Programs (DIMP) written Plan. For each required element the text of the DIMP rule is provided, followed by a description of the procedure to develop and implement that element.

a. Knowledge

   The Rule: 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 IM 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.

   The Procedure: (Numbers in parenthesis refer to the requirements shown above)

   (1 & 2) During the 8 threat assessments SHRIMP asks questions about the user's system design, operations and environmental factors necessary to assess the applicable threats and risks to distribution pipeline integrity. The user should refer to current and past design, construction, operation, inspection and maintenance records, as well as the knowledge of utility personnel to accurately answer questions posed by SHRIMP. SHRIMP includes a Data Source field with each question for the user to record the source of information used to answer each question. Information entered into this field will be included in an attachment to the written DIMP plan

along with a complete list of questions answered during the SHRIMP process. Where past data is requested by SHRIMP, a minimum of the previous 5 years' data is requested, however if more than 5 years' data is readily available the user is encouraged to use that data as well.

In addition, during the Risk Ranking Validation step, the user should consider any additional factors that may affect the probability and/or consequences of a failure of a particular section of distribution piping but that were not asked about by SHRIMP. Examples could include pipe located near hospitals, schools, nursing homes or other difficult to evacuate facilities; environmental factors such as soil corrosivity; and more. During the Risk Ranking Validation step, any additional knowledge considered by the user to change the relative risk ranking of any section should be described in the text box provided by SHRIMP. This description will be written into the written DIMP Plan in the Risk Ranking section.

(3) If any of the design, construction or environmental factors requested by SHRIMP are not readily available the user should answer "I don't know." SHRIMP will then offer pre-written text describing how the user will gain that information over time through normal activities conducted on the pipeline. The user can accept SHRIMP's plan or enter their own description of how that knowledge will be gained. The SHRIMP text or the user's text will be included in the written DIMP plan.

(4) A process by which the IM program will be reviewed periodically and refined and improved as needed using SHRIMP is under development. This procedure will require the user to revisit each question answered in SHRIMP and either confirm the answer provided is still accurate or update the information. SHRIMP will generate a log of differences between the old plan to the new plan. SHRIMP will save a copy of the old plan for 10 years. The user is also encouraged to download the new and old plans for their records.

(5) SHRIMP includes an attachment that is the implementation plan. This attachment summarizes all the actions required to follow the DIMP plan, including capture and retention of data on any new pipeline installed. Since each user may have a unique recordkeeping system SHRIMP cannot advise the best way to track this data and instead provides a text box for the user to describe how these records will be captured and retained.

b. Identify threats

The Rule: 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, patrolling records, maintenance history, and excavation damage experience.

The Procedure: SHRIMP uses an interview process to identify threats. The user must go through interviews for each of the eight threats listed above. In many cases there are two or more subthreat interviews within each threat interview. For example, the corrosion threat interview includes separate interviews for external, internal and atmospheric corrosion, and the external corrosion interview includes further separate interviews for different materials of construction (bare/coated, protected/unprotected steel, cast/wrought iron, etc.). These interviews ask for reasonably available information to identify existing and potential threats. All of the sources of data listed in the rule are directly asked for by SHRIMP except for continuing surveillance – continuing surveillance is the periodic review of other inspection and maintenance data to determine the continued serviceability of the pipe. If prior continuing surveillance reviews resulted in additional inspections or maintenance, the results of those actions should be entered into SHRIMP where SHRIMP asks for the results of such inspection and maintenance, therefore indirectly SHRIMP considers continuing surveillance records.

c. Evaluate and rank risk

The Rule: 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.

The Procedure: The SHRIMP Advisory Group developed a risk ranking model that assigns a numeric weighting to answers provided by the user. The risk ranking model is described in an attachment to this document.

Subdividing is not required by SHRIMP but encouraged where answers to SHRIMP threat assessment questions are different for different parts of the system. Many of the questions asked by SHRIMP during the threat assessment process are intended to assess the likelihood and consequences of a failure due to the threat being assessed. SHRIMP also asks questions to help determine if certain regions of the pipeline have similar characteristics and for which similar actions would be effective in reducing risk. If actual or potential threats identified during the threat assessment process are concentrated in certain areas, the user is encouraged to subdivide the system for that threat, separating the areas that have an actual or potential threat from those areas that don't. Subsections can be geographic, by material, by type of equipment (for equipment threat), by excavator crews or contractors (for excavation threat) or any other way of subdividing that makes sense for the user's situation.

If the user decides to subsection for any threat those subsections continue through the risk-ranking, implementing additional measures and performance measures steps. The system may be subdivided differently for each threat, since it is unlikely that an area at risk for one threat (e.g. external corrosion) would also be entirely at risk from another threat (e.g. natural forces).

d. Identify and implement measures to address risks

The Rule: Determine and implement measures designed to reduce the risks from failure of its gas distribution pipeline. These measures must include an effective leak management program (unless all leaks are repaired when found).

The Procedure: SHRIMP offers the user at least one option to reduce the risk from failure for each threat except "Other." In the risk ranking screen, clicking on "A/A's" brings up a list of potential additional/accelerated actions ("A/A Actions") that the SHRIMP Advisors have determined could be effective in addressing the actual or potential threat. Some A/A Actions may be listed first because answers provided by the user during the threat assessment process suggests these A/A Actions are likely to be effective, whereas other A/A Actions that aren't expected to be effective are listed separately.

The user can select one or more of the A/A Actions included in SHRIMP, which will result in pre-written text being inserted into the "Implement Measures" section of written DIMP plan for the particular subsection of the system and threat. If the user has a better idea, or has already implemented action addressing this threat, the user should create a user-defined A/A Action and select that A/A Action for this threat and subsection. What the user writes when defining the A/A Action will be written into the written DIMP plan.

For some threats SHRIMP will recommend that the user initiate some A/A Action to reduce risk. For most threats the SHRIMP advisors could not agree on any relative risk score or combination of threat interview answers that should automatically require the user to specify an A/A Action. It is therefore up to the user to use his/her best judgment as to which threat-segments merit additional actions to reduce risk. The DIMP rule does not presume that every operator needs to implement additional measures.

If a user elects to include additional measures to reduce risk for any of the threats and/or subdivisions of the distribution system, SHRIMP will offer one or more options for performance measures specific to that threat and subdivision. The use may select pre-written text offered by SHRIMP or substitute a user-defined performance measure. The user is required to select at least one threat and subdivision-specific performance measure for every additional action selected in the previous step.

At the end of the SHRIMP process, SHRIMP displays a list of action items, including mandatory performance measures [(i) through (v) in the next section] and any threat-specific additional measures the operator determines are needed to evaluate the effectiveness of the operator's IM program in controlling each identified threat. The user is asked to describe in a text box how each action will be implemented and that information is included in the Implementation Plan included as an attachment to the written DIMP plan.

e. Measure performance, monitor results and evaluate effectiveness

The Rule: Develop and monitor performance measures from an established baseline to evaluate the effectiveness of its IM program. An operator must consider the results of its performance monitoring in periodically re-evaluating the threats and risks. These performance measures must include the following:

i. Number of hazardous leaks either eliminated or repaired as required by Sec. 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 Sec. 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 IM program in controlling each identified threat.

The Procedure: The written plan created using SHRIMP includes a section stating that the operator will keep records necessary to report performance measures.(i) through (v). These performance measures must be captured and recorded outside of SHRIMP – SHRIMP does not currently include a recordkeeping or performance measure tracking mechanism, although those enhancements are contemplated in future upgrades.

Where a performance measure requires data that has not previously been collected and retained by the operator, the baseline for such performance measures will be the first year such data is collected and retained. Where the operator does have past data for any performance measure, the user must establish a baseline based on that historical data. The baseline should be included in the implementation plan text for that performance measure.

At the end of the SHRIMP process, SHRIMP displays a list of action items, including mandatory performance measures (i) through (v) above and any threat-specific additional measures the operator determines are needed to evaluate the effectiveness of the operator's IM program in controlling each identified threat. The user is asked to describe in a text box how each action will be implemented and that information is included in the Implementation Plan included as an attachment to the written DIMP plan.

f. Periodic Evaluation and Improvement

The Rule: An operator must re-evaluate threats and risks on its entire pipeline 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.

The Procedure: The SIF is currently working on a procedure to use SHRIMP to automate the re-evaluation process. SHRIMP includes

in the written plan a requirement for periodic complete program re-evaluations at least once every 5 years and more often if certain conditions are met. The user should consider additional events that might trigger a complete program re-evaluation.

A re-evaluation using SHRIMP is essentially revisiting each SHRIMP interview screen to verify the answer is still valid or updating information as necessary. The risk ranking screen must be reviewed to ensure it is still accurate. The user must review each of the 5 mandatory performance measures described above and any threat-specific performance measures included in the written plan and compare results to the baseline [Note: Where a performance measure requires data that has not previously been collected and retained by the operator, the baseline for such performance measures will be the first year such data is collected and retained.] Particular attention should be given to the threat-specific performance measures that measure the effectiveness of specific A/A Actions. If one or more of these performance measures indicates that the A/A Action is not effective, the user should consider modifying the A/A Action and/or implementing additional A/A Actions.

g. Report results

The Rule: Report, on an annual basis, the four measures listed in paragraphs (e)(1)(i) through (e)(1)(iv) of this section, as part of the annual report required by Sec. 191.11. An operator also must report the four measures to the state pipeline safety authority if a state exercises jurisdiction over the operator's pipeline.

The Procedure: The SHRIMP written DIMP Plan includes a Section on reporting results, listing procedures for reporting to both the federal and state pipeline safety agencies. Currently data to report these performance measures must be collected and retained outside of SHRIMP, however the APGA Security and Integrity Foundation (SIF) may modify SHRIMP to enable it to retain and submit these performance measures as well as mechanical fitting failure data and other data required by Distribution Annual Report Form 7100.1-1.

11.3.2. Relative Risk Model

The centerpiece of the Simple, Handy, Risk-based Integrity Management Plan (SHRIMP) is the risk ranking model. SHRIMP uses an index model in which numeric scores are assigned based on answers provided by the user to questions asked by SHRIMP. The index model was developed by the APGA Security and Integrity Foundation (SIF) with guidance by an advisory group comprised of industry and federal and state pipeline safety regulators.

Risk is the product of the probability of a failure times the consequences of a failure. The SHRIMP relative risk model considers both the probability and consequences of a failure for each of the eight threats. The equation is as follows:

Relative Risk Score	=	Probability Score (Normalized to 1 - 10)	x	Consequence Score (1.0 - 1.5)	x	Leak History Factor (1 + % of Lks)	x	Incident Probability Factor (1.0 or 1.25)

Each of the four components that go into the relative risk score are described in the following sections.

Probability Scoreis the sum of points assigned by answers to threat interview questions. Each segment receives a relative probability score for each threat based on the answers to a series of questions. The probability questions are based on the GPTC DIMP guidance, as modified and added to by the SIF SHRIMP Advisors. The weighting given to each possible answer are based on the knowledge and experience of the SHRIMP Development Team and the SHRIMP Advisors.

Table 11.16. Probability Scores

Threat	Subthreat category	Maximum Score	Minimum Score	Incident Probability Factor
Natural Forces	No subthreats	19	0	1
Other Outside Forces	No subthreats	12	0	1.0
Excavation Damage	Grouping by concentration of damages or tickets	39	0	1.25
	Grouping by operator crew or operator contractor damage	34	0	1.25
	Grouping by Third Party Damage	31	0	1.25
	Blasting	15	0	1.25
Corrosion	External Corrosion	16	1	1
	Internal Corrosion	30	1	1
	Atmospheric Corrosion	25	1	1
Incorrect Operations	Failure to Follow Procedures	5	1	1.25
	Inadequate Procedures	5	1	1.25
	Operator Qualification	5	1	1.25
	Drug & Alcohol	5	1	1.25
Equipment	No subthreats	5	1	1
Material, Welds or Joints	No subthreats	5	1	1
Other	No subthreats	None (User assigns rank)		1

Because there are different numbers of questions for each threat and subthreat, the maximum possible score for each threat and subthreat

are different, therefore the probability score for each threat-segment is normalized to a scale of 1 - 10 using this equation:

Normalized probability score = 1 + (9 x (subthreat score - subthreat minimum score) / (subthreat maximum score - subthreat minimum score))

For example, if a segment received a score of 9 for external corrosion the normalized probability score would be 1 + (9 x (9-1) / (16-1) = 1 + 9 x 8/15 = 5.8

Incident Probability Factor

The normalized probability factor described above is useful to rank various sections by the probability of a failure occurring within each of the eight threats, but SHRIMP also must rank sections across the eight threats. Failures due to some threats are more likely to cause death, injury or significant property loss than other threats. DOT Distribution Annual and Incident Report data shown below provide an indication of how likely it is that a failure (e.g. leak) due to one of the 8 threats will result in death, injury or significant property loss.

Table 11.17. Incident Probability Factor

Reported Cause of Incidents and Failures 2005-2007	# of Incidents	# of Failures	Incidents/1000 Failures	Normalized to Corrosion
Corrosion	6	293,933	0.02	1
Excavation Damage	73	338,666	0.22	11
Incorrect Operations	8	30,145	0.27	13
Material, Weld or Joint Failure	8	147,384	0.05	3
Equipment Failure	6	140,442	0.04	2
Natural Force Damage	22	77,229	0.28	14
Other Outside Force Damage	39	37,426	1.04	51
All Other Causes *	NA	NA	NA	
* Excluding Fire First Incidents				

The results of this analysis find that failures due to three threats (corrosion, material failure and equipment failure) are least likely to result in reportable incidents, that failures due to excavation damage, incorrect operations and natural force damage are moderately likely to result in reportable incidents and that other outside force damage failures are most likely to result in reportable incidents.

The advisors agreed to assign an Incident Probability Factor of 1.0 (no increase in relative risk score) for Corrosion, Materials/Welds, Equipment, and Other Outside Force Threats where it is relatively unlikely a failure will result in a reportable incident. For Excavation, Incorrect Operations, and Natural Force Threats where it is relatively more likely that a failure will result in a reportable incident the advisors agreed on an Incident Probability Factor of 1.25 (e.g. a 25% increase in relative risk score for these threats).

Further investigation of the "other outside force" category revealed that virtually all the incidents involved vehicles striking above ground facilities, usually meter sets. The SHRIMP advisors agreed with the PHMSA Phase 1 report conclusions that there was not enough information to conclude that vehicular damage could have been anticipated at the location of these incidents or whether meter protection existed, therefore no additional weighting is provided for this threat. SHRIMP does, however, include assessment of vehicle damage in the threat assessment and offer additional/accelerated actions if vehicular damage is found to be a significant threat.

If the user sections the system by geographic area, the Consequence Score is determined by points assigned based answers to threat interview questions as follows:

Table 11.18. Consequence Score (Geographic Area Sections)

	Question	Possible Answers	Weighting
CSQ-1	Are the pressure and/or diameter of this section greater than or about the same as the system as a whole?	Substantially greater	0.2
		Somewhat greater	0.1
		About the same	0
CSQ-2	Is this section predominantly located in business districts or outside business districts (as those are defined for leak survey)?	Within Business Districts	0.15
		Outside Business Districts	0
CSQ-3	How long would it typically take utility crews to reach this part of the system after receiving notice of a possible failure?	Less than one (1) hour	0
		Between one (1) and two (2) hours	0.025
		More than two (2) hours	0.05
CSQ-4	What would be the impact on the utility and its customers if this section were to fail?	Low	0
		Moderate	0.05
		High	0.1

The base consequence factor is 1.0

1. Greater pressure and/or diameter can increase the consequence factor by up to 20% (1.0 to 1.2)

2. Sections predominantly within business districts get an additional 15% increase in the consequence factor

3. The time to respond to a failure results in an increase in consequence factor of up to 5% (1.0 to 1.05)

4. The significance of the facility can result in an increase in consequence factor of up to 10% (1.0 to 1.1)

These weightings are based on the knowledge of the subject matter experts on the SHRIMP Advisory Group. These increases are added together to calculate the consequence factor for the section. If all four questions were answered so that maximum scores were assigned, the consequences factor would be 1.50 (1.2 + 1.15 + 1.05 + 1.1). The overall relative risk score would be increased by 50%.

If all four questions are answered so the minimum scores are assigned, then the consequence factor will be 1.0 and the relative risk score would be unchanged by this factor.

If the user does not create subsections for a threat, then these consequence questions are not asked.

For the threats shown below where the geography based threat questions do not apply the following threat specific consequence questions are asked:

Table 11.19. Consequence Score (Non-Geographic Area Sections)

	Question	Possible Answers	Weighting
CSQ-EXC1	Have the (crews/contractors/excavators) identified for this section caused damage that resulted in a reportable incident?	Yes	0.3
		No	0
CSQ-EXC2	Considering disruption of service and cost to return the system to service, how serious are the damages caused by the (crews/contractors/excavators) identified for this section when compared to all other excavation caused damages?	More serious	0.3
		Less serious	0
		About the same	0.1
CSQ-GEN1	What would be the potential consequences (injuries and/or property loss) if a failure were to occur because of this problem?	High likelihood of serious injury and/or property loss	0.5
		Moderate likelihood of injury and/or property loss.	0.25
		Not likely to result in injury and/or property loss.	0
EQIPCSQ-1	Is the size/capacity of the equipment substantially greater or lesser than other equipment in the system as a whole?	Substantially greater	0.2
		Somewhat greater	0.1
		About the same	0
EQIPCSQ-2	Does the equipment primarily affect the system located in the business district?	Within Business Districts	0.15
		Outside Business Districts	0
EQIPCSQ-3	How long would it typically take utility crews to reach this part of the system after receiving notice of a possible failure?	Less than one (1) hour	0
		Between one (1) and two (2) hours	0.025
		More than two (2) hours	0.05
EQIPCSQ-4	What would be the impact on the utility and its customers if this equipment were to fail?	Low	0
		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.

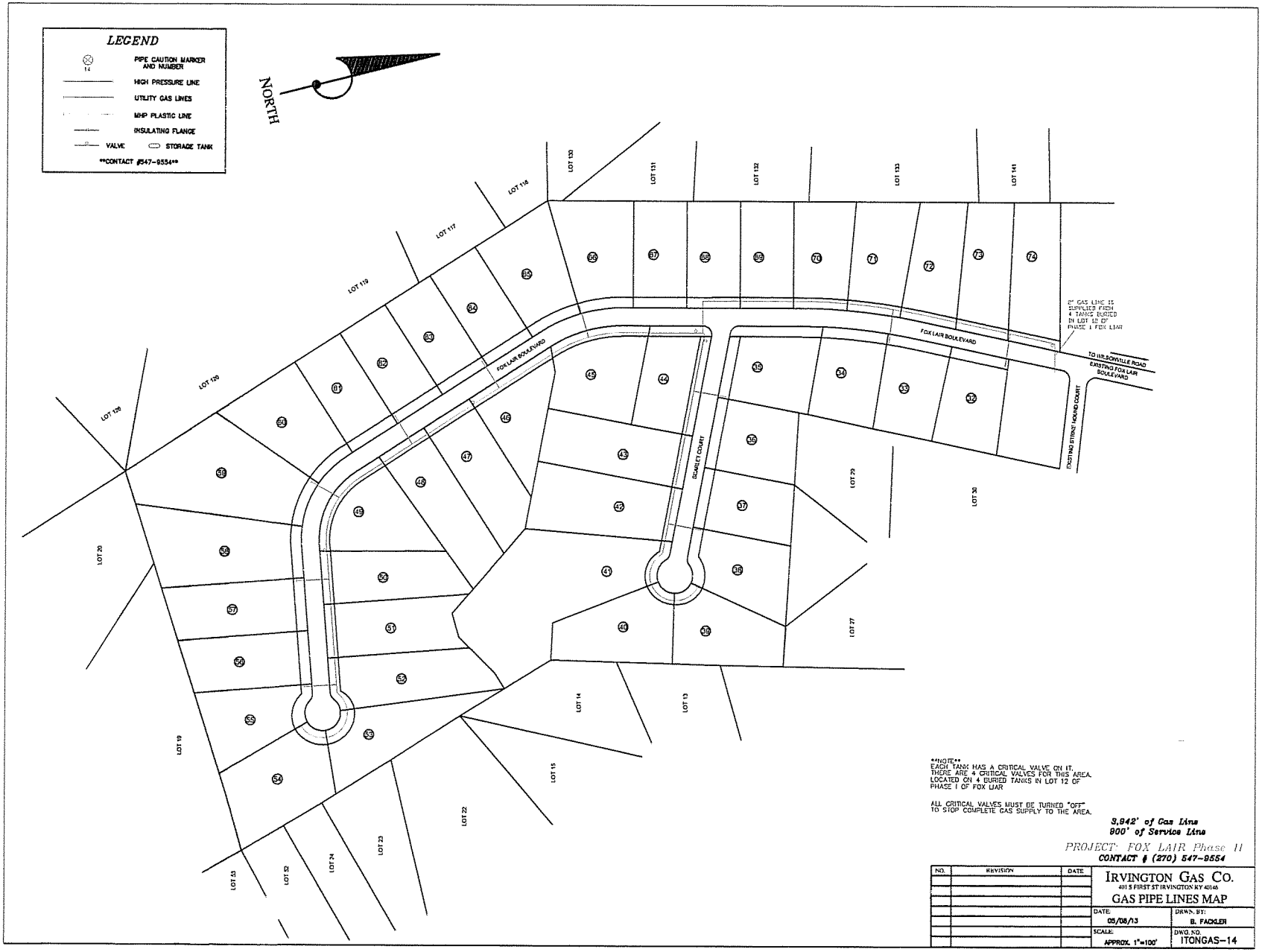
The Leak Cause Factor equals 1 + the percentage of leaks associated with threat to the total number of leaks for the system.

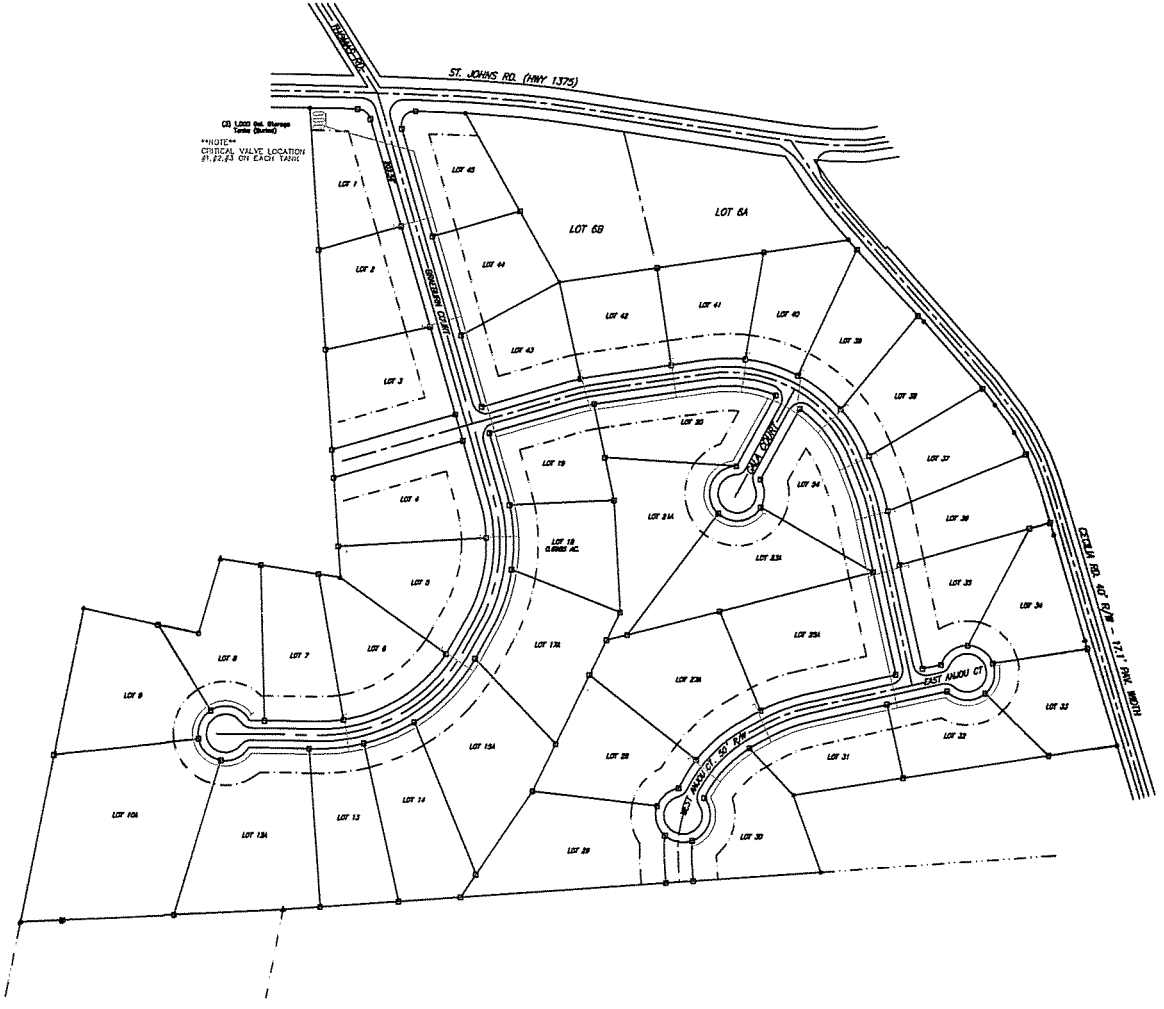
If the number of total leaks over a five year period are less than 50, the national average is used rather than the userís leak history data because with fewer than 50 leak repairs the relative percentages of leaks by cause may be skewed by a handful of leak repairs that are not representative of the 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 11.20. 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.


LEGEND
PIPE CAUTION MARKER AND NUMBER
HIGH PRESSURE LINE
UTILITY GAS LINES
MHP PLASTIC LINE
INSULATING FLANGE
VALVE
STORAGE TANK
CONTACT #547-9554
NORTH
LOT 100
LOT 131
LOT 132
LOT 133
LOT 141
LOT 116
LOT 117
LOT 119
LOT 120
LOT 126
LOT 20
LOT 19
LOT 15
LOT 22
LOT 23
LOT 24
LOT 52
LOT 55
LOT 14
LOT 13
LOT 29
LOT 30
LOT 27
FOX LAIR BOULEVARD
SCARLET COURT
EXISTING STRAIT HOUND COURT
TO IVB BOWVILLE ROAD
EXISTING FOX LAIR BOULEVARD
6" GAS LINE IS SUPPLIED FROM 4 TANKS BURIED IN LOT 12 OF PHASE 1 FOX LAIR
NOTE
EACH TANK HAS A CRITICAL VALVE ON IT. THERE ARE 4 CRITICAL VALVES FOR THIS AREA. LOCATED ON 4 BURIED TANKS IN LOT 12 OF PHASE I OF FOX LAIR
ALL CRITICAL VALVES MUST BE TURNED "OFF" TO STOP COMPLETE GAS SUPPLY TO THE AREA.
3,942' of Gas Line
900' of Service Line
PROJECT: FOX LAIR Phase II
CONTACT # (270) 547-9554
NO.
REVISION
DATE
IRVINGTON GAS CO.
401 S FIRST ST IRVINGTON KY 40146
GAS PIPE LINES MAP
DATE: 05/08/13
DRWN. BY: B. FACKLER
SCALE: APPROX. 1"=100'
DWG. NO. ITONGAS-14



LEGEND

- PIPE CAUTION MARKER AND NUMBER
- HIGH PRESSURE LINE
- UTILITY GAS LINES
- PLASTIC LINE
- INSULATING FLANGE
- VALVE

** KENTUCKY UNDERGROUND PROTECTION **
1-800-752-5007
** TICKET #20032804818 **

NORTH

NOTE
EACH TANK HAS A CRITICAL VALVE ON IT.
THERE ARE 3 CRITICAL VALVES IN THIS AREA.

ALL CRITICAL VALVES MUST BE TURNED "OFF" TO STOP COMPLETE GAS SUPPLY TO THE AREA.

4,195' of Gas Lines
1,080' Service Lines
PROJECT: THE ORCHARD
CONTACT #(270)547-9554

NO.	REVISION	DATE

IRVINGTON GAS CO.
401 S FIRST ST IRVINGTON KY 40146
GAS PIPE LINES MAP

DATE:	DRWN. BY:
05/02/2013	B. FACKLER
SCALE:	DWG. NO.
APPROX. 1"=100'	ITONGAS-12