

Simple, Handy, Risk-based
Integrity Management Plan
(**SHRIMP™**)



User's Guide
v4.0



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BEFORE USING SHRIMP™, PLEASE READ THIS BACKGROUND DOCUMENT!

On December 4, 2009, the Pipeline and Hazardous Materials Safety Administration (PHMSA) published the final Distribution Integrity Management Program (DIMP) rule. The rule requires each operator of a natural gas utility, master meter system or propane pipeline system to prepare and follow a written DIMP Plan by no later than August 2, 2011.

The American Public Gas Association (APGA) Security and Integrity Foundation (SIF), with financial support from PHMSA, developed **SHRIMP™** (Simple, Handy, Risk-based Integrity Management Plan), an on-line tool to create a written DIMP Plan ready for implementation and is customized for your unique system. An advisory group composed of government and industry pipeline safety experts guided the development of **SHRIMP™**, ensuring that all the requirements of the rule are included in the written DIMP Plan that **SHRIMP™** creates for you. We are pleased that you have elected to use **SHRIMP™** to guide your DIMP program.

What is “SHRIMP™”?

SHRIMP™ is an on-line tool that guides users through the threat identification and assessment process and results in a written Distribution Integrity Management Plan. It is much more than a model plan. It asks questions about your pipeline system inspection and maintenance history and creates a written DIMP Plan ready to implement.

SHRIMP™ includes (bold, underlined text indicates an element required by the DIMP regulation):

- A template for a written DIMP Plan, which is filled out with text, either provided by **SHRIMP™** or text that you enter during the question-and-answer process;
- PHMSA Distribution Annual Report data input including system’s material of construction and leaks repaired by cause. You can edit these data or, if not found (as will be the case with master meter and low pressure (LP) piping systems, which do not file annual reports), enter your system data;
- A question-and-answer **threat identification and assessment** process including:
 - Questions that ask for specific construction, inspection and maintenance history (e.g., **“knowledge of the infrastructure”**) to assess each of the eight threats required by the DIMP rule,
 - Questions that ask for information to help the user decide if subdividing the system for any threat is advisable; and
 - Questions to help **SHRIMP™** recommend one or more Additional/Accelerated Actions to address one or more threats.
- A mathematical model to **evaluate and rank risk** according to the relative risk;
- A pick list of possible Additional/Accelerated Actions (“A/A Actions”) the user may



choose to identify and implement measures to address risks;

What is a “Threat”?

A threat is something that can cause distribution pipes or components to leak. The DIMP rule requires the user to assess the following 8 threats:

1. Corrosion;
2. Natural forces;
3. Excavation damage;
4. Other outside force damage;
5. Material, weld, or joint failure (including compression coupling);
6. Equipment failure;
7. Incorrect operation; and
8. Other threats not included in the above seven specific threats.

What are “Additional/Accelerated Actions”?

The objective of an integrity management program is to evaluate if threats exist that may undermine the integrity of your assets and determine if you should be doing more to address any of the 8 threats on all or just certain parts of your distribution system. The term “Additional/Accelerated Actions” (“A/A Action”) is used in **SHRIMP™** to mean actions to reduce threats that go beyond the minimum maintenance and inspection requirements of the federal pipeline safety regulations. For example, though not explicitly required by pipeline safety regulations, a utility might determine that a construction project poses an unacceptably high risk of excavation damage to a major feeder main; therefore, the utility will do more than just mark the location of the main – it will conduct daily inspections of the job site to ensure the pipeline is being protected and supported and that no damage to the coating or pipe has occurred. Daily excavation inspection is one example of an Additional/Accelerated Action to address an excavation damage threat.

The **SHRIMP™** software includes over 60 optional Additional/Accelerated Actions that the user can pick from if it is determined that more needs to be done to address any of the eight threats on all or any portion of the user’s distribution system. When you pick an A/A Action, **SHRIMP™** inserts text describing the A/A Action into your written DIMP Plan. You can review the words that **SHRIMP™** will insert into your DIMP Plan and substitute your own description in place of the pre-written **SHRIMP™** description if you choose. You may already be doing something beyond regulatory requirements – perhaps a replacement program for bare steel, cast iron, or other materials. **SHRIMP™** allows you to enter a description of these as an A/A Action that will be included in your DIMP Plan.



Why Would I Want To Subdivide My System When Using SHRIMP™?

SHRIMP™ begins by considering your system as a whole, but you may want to subdivide it into smaller sections for the purpose of evaluating threats, ranking risks, and taking A/A Actions.

The goal of DIMP is to focus resources on the problem areas – areas with a higher risk relative to the rest of the system. Some of the possible A/A Actions could be expensive; replacing pipe for instance. You don't want to write into your DIMP Plan that you will replace your entire system if only a small portion of it is higher relative risk. You should subdivide that smaller section from the rest of the system and evaluate the threat separately for the problem section and the rest of the system that is not experiencing the problem.

When answering the questions asked by **SHRIMP™** you may find some instances where the answer is true for parts of your system but not for the rest. An obvious example would be when considering the threat of corrosion, corrosion leaks may be occurring on your steel piping but (hopefully!) not on your plastic piping. Keep in mind that, at the end of the process, **SHRIMP™** will create a written Plan that may include Additional/Accelerated Actions to address corrosion. You want those actions to be focused on the problem area – the steel part of your system – not on the entire system, so you would subdivide your system into steel and plastic and evaluate the corrosion threat on each part separately.

SHRIMP™ allows you to create different subdivisions for each threat. Subdivision can be:

- By material of construction, e.g., plastic, coated or uncoated steel, pre-1970 Aldyl A plastic (a known problem material under the material, welds, or joint failure threat), etc.;
- By geography, e.g., piping and equipment in an area known to be prone to flooding;
- By asset type, e.g., regulators, valves, couplings, etc. that are experiencing problems;
or
- By people, e.g., certain excavators that cause more damage to lines than others.

Everything included within a subsection should have similar risk characteristics and which similar actions likely would be effective in reducing risk. Evaluating the threat of corrosion separately for different materials is so obvious that **SHRIMP™** forces you to separately evaluate the corrosion threat for plastic, steel (further subdivided according to coated, bare, cathodically protected, and unprotected steel), and cast-iron pipe. Other than that, it is up to you to decide whether you want to further subdivide your system.

The advantage of subdividing, as mentioned previously, is that it focuses A/A Actions on the problem areas. The disadvantage is that subdividing increases the time and effort you expend creating your plan using **SHRIMP™** and results in a longer, more complicated written Plan. **SHRIMP™** includes some questions to get information to help you decide whether or not to subdivide, but the ultimate decision is yours. Giving this some thought BEFORE you begin using **SHRIMP™** will save time and avoid confusion.



Some of the questions **SHRIMP™** will ask are:

- Are corrosion leaks, indications of metal loss due to corrosion, low pipe-to-soil potential readings, etc. occurring all over, or concentrated in certain localized areas?
- Are the number of ONE-CALL locate tickets and/or excavation damages spread throughout the system, or concentrated in certain areas?
- Are there certain excavators that cause excavation damage more often than others?
- Are there areas in your system subject to flooding, washouts, landslides, or other earth movement?
- Have you experienced a rash of failures of certain types of equipment or piping materials?

SHRIMP™ does not force you to keep the subdivisions you created for one threat when you begin another threat – each threat assessment starts out treating your system as a whole. You can subdivide your system one way for evaluating the threat of corrosion and an entirely different way for evaluating excavation damage.

If you are already doing something above and beyond the regulations on part of your system – a bare steel pipe replacement project, for instance – it probably makes sense to treat that part of your system as a separate section when evaluating the corrosion threat. Or, if you are replacing part of your system made of a type of plastic pipe prone to brittle cracking, that should be treated as a separate segment when assessing the threat of material, weld, or joint failure.

Some A/A Actions are relatively inexpensive or aren't practical on small areas. If, for example, at the end of the **SHRIMP™** process the A/A Action chosen is to increase leak survey frequency, it may be just easier and no more expensive to conduct the more frequent surveys to a fairly large area rather than in just a few isolated areas within the system.

What Records Must I Have To Use **SHRIMP™**?

SHRIMP™ was designed to create a DIMP Plan using information from construction records and gathered from inspections and maintenance activities required by federal and state pipeline safety regulations, such as leak surveys, pipe-to-soil potential measurement, exposed pipe inspections, leak repair records, etc. [Appendix A](#) lists the specific records required for each threat assessment that you should have available before trying to use **SHRIMP™**. It also describes how **SHRIMP™** will ask you to sort some of your inspection and maintenance data.

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 below. Each step should be completed before moving on to the next step. These steps are described in detail later in this User's Guide.



Step 1: Enter System Information

If you are a public utility, your system probably filed a Distribution Annual Report (Form 7100.1-1). New SHRIMP users will need to populate the System Information page with their Annual Report Data. Existing users should confirm that the existing data is still true and appropriately update up to the most recent Annual Report data.

Step 2: Select Settings

The next step is to enter the Required Settings for your plan. These include:

- The name of your system as it will to appear in the written Plan.
- A description of what part of your system this plan covers (default is entire system).
- Whether you are a natural gas distribution utility, master meter, LP piping system or small LP-piping system. (There are different recordkeeping requirements for master meter and small LP piping systems).
- The History Period – Some of the threat assessments ask for past data on leak repairs and excavation damage. Enter here how many years back you will enter such inspection and maintenance data. The default and minimum is 5 years, but you can change this to up to 10 years if you have the data. More years of data = better DIMP Plans.

- Leak Location Procedure – Insert a cross reference to your existing leakage survey and odor call response procedures.
- 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.
- A program re-evaluation period, anywhere from 1 to 5 years.
- The identity of the pipeline safety agency that audits your regulatory compliance.
- External sources of information you used in your plan – Select any trade associations, government agencies, or other system operators appropriate from the list presented



and/or enter your own description of external sources.

- Enter the names of those responsible for ensuring that the requirements of this Plan are carried out.

Step 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 sub-threats. You must complete each threat and sub-threat interview before going to Steps 4 and beyond. You can go back and change any of the information you provide in the threat interviews. This is described in more detail later in this user's guide.

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 user's guide.

Step 4: Validate Risk Rankings

After all eight 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 of the risk that a segment of your system to fail due to the threat. A complete description of this risk ranking model is found in [Appendix A](#), as well as an attachment to your written DIMP Plan created by **SHRIMP™**.

“Validating” means reading the explanation of why **SHRIMP™** ranked each section where it did. Do you agree with that ranking? Based on your knowledge of your system, should it be ranked higher or lower? If so, you can re-assign the risk rank and provide an explanation why you feel that section should be ranked differently. The validation process is described in the [Filling Out Risk Rankings](#) section.

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



Step 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. Additional guidance can be found in the [Selecting Additional/Accelerated Actions](#) section of this user’s guide.

SHRIMP™ offers at least one additional action for each threat. This step is intended to satisfy the following requirement of the DIMP rule: Section 192.1007 (d) Identify and implement measures to address risks.

Step 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. This is not required for master meter and LP-piping operators.

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

Step 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 blue button bar at the top of each page. 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. Describe 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;
2. Describe how you will implement any Additional/Accelerated Actions that you included in your written DIMP Plan; and
3. Describe how, during the normal course of business, you will gather any information that was unknown to you during the threat assessment process.

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.



Step 9: Add Text (If necessary)

If you determine additional text is necessary in your plan, **SHRIMP™** offers the opportunity in a few select places. View where those predetermined areas are in the Add Text feature.

Step 9: Generate and Download Your Written DIMP Plan

When you are satisfied that Steps 1-8 are complete, you should download your written DIMP Plan to your computer.

Step 10: Implement the Action Items in Your DIMP Plan

Just like all the other plans required by pipeline safety regulations, you must follow your plan exactly as written. Failure to follow through on actions in your written DIMP Plan can result in fines and other penalties. You must maintain records to demonstrate that you are following through on each action item listed in your written DIMP Plan. You must have these records and your written Plan available for review by your state (and/or federal, if you are under federal jurisdiction) pipeline safety inspectors. Some states may require you to submit your written Plan for their review.



Getting Started

- You should start by opening up your internet browser and navigating to <https://shrimpaccess.rcp.com>.
- After doing so, you will be presented with an access request form to fill in. Please fill in your name, email address and DOT #.

Access Requests **Add Access Request**

Welcome to the SHRIMP User Access Request Portal.
Please fill in your name, email and DOT # below. Please use the email address that you signed up for SHRIMP with.

First Name	Last Name
<input type="text"/>	<input type="text"/>
Email Address *	DOT #
<input type="text"/>	<input type="text"/>

- The system will verify your SIF SHRIMP subscription status. The outcome will end in one of three ways:
 - Your subscription is expired, or you are not a current subscriber: This will send you an automated email with instructions on how to subscribe or renew your subscription.
 - Your subscription is valid, but you have never used SHRIMP 4.0 before: This will send an automated email to the system administrators to add you as a user and send an invitation email to set up your account to gain access. **NOTE:** It may take up to an hour for you to receive an invitation email.
 - Your subscription is valid and you are in the SHRIMP 4.0 system: This will send you an automated email with instructions on how to access SHRIMP.
- Once you have logged into SHRIMP 4.0, you may be presented with a selection screen for which application you wish to enter. You will want to choose SHRIMP.



SHRIMP



- Once you click the SHRIMP application, you will be presented with your dashboard.
- If you are a multi-operator, you will see a specialized dashboard and should click the Manage button on whichever operator role you need to fill.

SHRIMP > Multi Operator Home Page

Welcome to SHRIMP 4.0

- Select an Operator below to manage (Assessments will be shown only for the selected Operator)

Operator Name	DOT ID	Current Active Operator	Manage
ABC Energy	12345	✓	Manage

- Otherwise, you will see a screen much like this.

Operator > Home

Welcome to SHRIMP 4.0

Guidance

Note: Please review the **Technical Notes** for information on the following topics:

- Using SHRIMP for the first time.
- Changing the Plan Year.

Below is a list of systems associated with your Operator ID. You can update system data by using the **Manage** button beside the system you want to update.

Below is a list of assessments that you have performed on your systems or are currently working on.

In the assessment list below, choose the action you wish to perform on that assessment by clicking one of the buttons:

- **Manage:** Choose this to review, correct, or revise the assessment.

If you want to view all of your completed plans, click the **"DIMP Plans"** button.

If you want to add a new system, click the **"New System"** button.

If you want to begin a new fresh assessment, click the **"New Assessment"** button.

If you want to start a new assessment while maintaining your prior assessments information, click the **"Manage"** button on your most current assessment below and then press the **"Copy Assessment"** button.

- [New System](#)
[New Assessment](#)
[DIMP Plans](#)

Systems

	System Name	State of Operation	Operator Name	DOT ID
Manage	TEST	Ohio	ABC Energy	12345

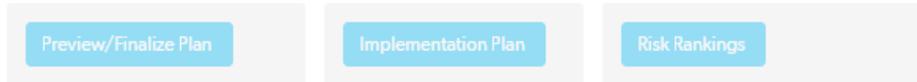
Assessments

	System Name	Plan Year	Plan Version
Manage	TEST	2027	
Manage	TEST	2027	
Manage	TEST	2026	2026
Manage	TEST	2026	

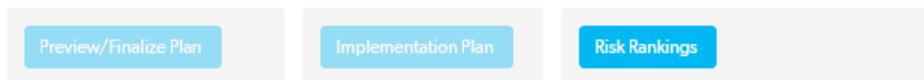


Process Flow

In SHRIMP 4.0 the process flow ensures that each step of the process is done in sequence. This ensures that the DIMP Plan is completed fully and has no missing information. The process flow is as follows:



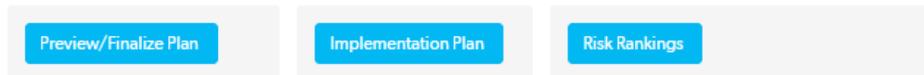
Step 1: An assessment is created or resumed. The first thing to complete will be the interviews and sub-interviews. The progress indicator will show you which interview tabs have additional information required.



Step 2: Once the interview tabs are fully completed The button to move onto your risk rankings will become active. Upon clicking it, you will be brought to the Risk Ranking section, where you will need to fill out each risk ranking. At this point you may also re-rank your risks as needed, which will be discussed further in a following section.



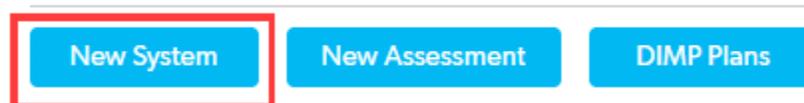
Step 3: Once all Risk Rankings have been completed, your Implementation Plan will become available via its own button. Fill in the required information for the Implementation Plan and you will be able to finalize and generate your completed DIMP Plan.



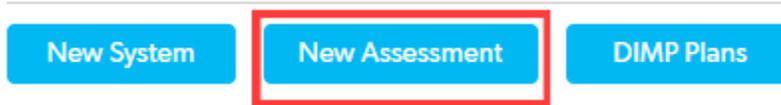
With an understanding of these steps, we will now move into further detail, starting with an explanation of adding a new system, or an assessment to that system.

Adding a New System or Assessment

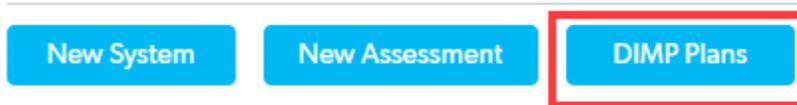
Below the integrated instructions, you will see three buttons. These buttons are as follows:



- **New System:** This button is used to create a system if one is not present for your operator record or you have an additional system to add. This is the highest level of record that can be created in the SHRIMP 4.0 application and represents the entire system including all of its components. To learn more about systems [click here](#).



- New Assessment:** This button is used to create an assessment for a system. An assessment is a record type which holds all of the interviews and information that go into your DIMP plan. Each assessment represents a plan year and version. Each year you will create a new assessment instead of updating a previous one. To learn more about assessments [click here](#).



- DIMP Plans:** This button is used to pull up a list of all the DIMP Plans for your assigned operator. These plans will be listed by System Name, Version, and Document File Name.

Documents > List All

▶ Reports & Charts

Search records Document Name System ID (f)

System Name	Assessment - Version	Document File
TEST	3.2.4	TEST-2021-Vers__3_2_4.docx
TEST	3.2.4	TEST-2021-Vers__3_2_4.docx
TEST	3.2.4	TEST-2021-Vers__3_2_4.docx
TEST	Test 1.0.1	TEST-2023-Vers__Test_1_0_1.docx

Sequence of Records

- The sequence of actions needed to complete a new DIMP Plan is as follows:
 - Select “Add System” and fill in all requested information.



Systems > Add System
▶ Reports & Charts

System General Information

Guidance:
 -You cannot change the Operator Name and DOT ID.
 -Enter System Name as you want it to appear in the written plan.
 -Enter system description if this is for only a portion of the distribution system named in System Name. This will be inserted into the scope section of the written plan. If this is for your whole system, leave the default of "Entire System".
 -Select the state in which this system operates from the drop down list.
 -Data Source is a text field in which you can enter anything. Where SHRIMP 4 asks for data from records, such as inspection and leak repair information, the data field should be used to record the source(s) relied upon to answer the questions. Anything you write in this field will be included in an attachment to the written plan.

Operator *

System Name

System Description

State of Operation

Office Address

Headquarters Address

- Then select "New Assessment" assessment for the created system and fill in all base interview information.

Guidance: When starting a fresh assessment, select the system you want to asses in the dropdown below, which lists your systems. Put in the assessment version number and assessment year.

System Name **DOT ID:**

Plan Version **Plan Year**

System Overview

Headquarter's Contact Information	System's Contact Information
Street Address <input type="text" value="6000 Universal Blvd"/>	Street Address <input type="text" value="1 Cedar Point Drive"/>
City <input type="text" value="Orlando"/>	City <input type="text" value="Sandusky"/>
State <input type="text" value="Florida"/>	State <input type="text" value="Ohio"/>
Zip <input type="text" value="32819"/>	Zip <input type="text" value="44870"/>



- At this time, or in any subsequent step, fill in your required settings.
- Once you have selected the system you want to assess, input the plan year and plan version, you can scroll down to the “Choose what you want to do” section and press the Resume button to start the interview process.
- In the interview overview screen, you will see a tab for each of the threats that SHRIMP evaluates. All of the base interviews should be ready for you to edit and complete. Depending on your answers, you may have sub-threat interviews show up under each tab that you will be required to complete as well before moving onto the next step. You can also add extra of each type of interview from this page if you want to sub-section your system.

Assessment Overview

System Name DOT ID
 Plan Version Plan Year

USER ALERT: Please verify you have completely answered ALL interviews prior to going to the next step of risk ranking. In some situations you may need to click the 'Add Interview' button for any sub-threats that appear, even if there is a note stating 'No ____ found'. Currently not all required interviews & sub-threat interviews will show as 'Incomplete'.

Guidance: use the "add interview" button below to start the interview. If you want to assess the entire system, fill out one interview. If you want to section out your system to assess this threat on each section, fill out one interview for each section.

Full Report | Grid Edit | Email | More ▼ 1 Atmospheric Corrosion

<input type="checkbox"/>	Interview	Status	-	-	-
<input type="checkbox"/>	Atmospheric Corrosion ()	Incomplete	<input type="button" value="Edit"/>	<input type="button" value="Review"/>	<input type="button" value="Delete"/>



- When you have completed all the interviews, you will be able to begin on your risk rankings. Use the Edit button on the right side of each risk ranking in the list if you need to re-rank your threats and to add additional/accelerated actions.

Guidance: this report shows the risk ranking scores for each of the interviews that you filled out in the prior step. Review how each interview ranks compared to each other. When you are ready to mitigate the risk for a specific threat, click on the 'Edit' button for that threat on the right side of the report.

Note: When you put in a user rank to override the SHRIMP ranking, please give it a moment and refresh your browser to see the update in the overall rank. The system needs to run through all rows of data to reorganize and re-rank everything, which can take up to a few minutes.

[Return To Assessment](#)

[Required Settings](#)

[Add Text](#)

[Implementation Plan](#)

[Preview/Finalize Plan](#)

Risk Ranking List

Full Report Grid Edit Email More ▾ 60 Risk Ranking records												
<input type="checkbox"/>	Interview	Rank	User Ranking	Shrimp Ranking	Relative Risk Score	Threat Score Total	Normalized Probability	Consequence Score	Leak History Factor	Incident Factor	Status Text	
<input type="checkbox"/>	Drugs and Alcohol (Test-)	1		1	19.22	5	10.00	1.5	1.025	1.25		Edit View
<input type="checkbox"/>	Failure To Follow Procedures (Test-Test)	1		1	19.22	5	10.00	1.5	1.025	1.25	No AA Chosen No PM Chosen	Edit View
<input type="checkbox"/>	Operator Qualification Revocation (Test-3)	1		1	19.22	5	10.00	1.5	1.025	1.25	No AA Chosen No PM Chosen	Edit View
<input type="checkbox"/>	Blasting Damage (Test-1)	4		4	18.86	8	8.88	1.7	1	1.25	No AA Chosen No PM Chosen	Edit View
<input type="checkbox"/>	Blasting Damage (-)	5		5	18.86	8	8.88	1.7	1	1.25	No AA Chosen No PM Chosen	Edit View



- Once you have verified your risk rankings and added Additional Actions and Performance Measures, you will be able to begin your Implementation Plan. Fill in all of the text fields on this page to complete your Implementation Plan.

Return To Assessment

Risk Rankings

Required Settings

Add Text

Preview/Finalize Plan

Implementation 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 Pan, including, at minimum, the location where new piping and appurtenances are installed and the material of which they are constructed.

TEST will implement as follows:

Be sure to include at least the timetable for initiating and completing these changes and the names and/or job titles of the persons responsible for making these changes.

B) Mechanical fitting failure data, including:

- A) location of the failure in the system,
- B) nominal pipe size,
- C) material type,
- D) nature of failure including any contribution of local pipeline environment,
- E) fitting manufacturer,
- F) lot number and date of manufacture, and
- G) other information that can be found in markings on the failed fitting

- At any time before completing your plan, you may press the Add Text button to add additional text to specific areas of your DIMP Plan. This is further addressed later in a dedicated section.

Assessment Overview

System Name TEST DOT ID 12345
Plan Version Plan Year 2027

Risk Rankings

Required Settings

Add Text

Implementation Plan

Preview/Finalize Plan

USER ALERT: Please verify you have completely answered ALL interviews prior to going to the next step of risk ranking. In some situations you may need to click the 'Add Interview' button for any sub-threats that appear, even if there is a note stating 'No ____ found'. Currently not all required interviews & sub-threat interviews will show as 'Incomplete'.

- Once you have completed your Implementation Plan, you will be able to preview and finalize your DIMP document. On this page, you can adjust your plan version, plan



year, date effective, and add the Plan Version History to your document.

- When you are ready you can click one of the purple Generate buttons to generate a Word or PDF version of your DIMP document. **NOTE:** You may generate as many DIMP documents as you like for each assessment.

Return To Assessment
Risk Rankings
Required Settings

Plan Information

System Name: TEST DOT ID: 12345

Plan Version * Plan Year * Date Effective *

Added Text to Scope Section *

Previous Plan Version *

Plan Version History

Version History was not pulled from SHRIMP 3, please populate with your version history from table 1 of your most recent completed plan.

Plan Version	Program Version	Date	Notes	By User	-	-
No plan version notes found						

[Add Version History](#)

Documents

Please, only click Generate a single time. Wait for it to generate before clicking again.

Generate DIMP Word
Generate DIMP PDF
Upload User File

Document File	Date Created	User Uploaded	Generated By
No documents found			

Imports From SHRIMP 3

SHIMP 4 supports the import of information from SHIMP 3 in order to ensure continuity of data, without sacrificing convenience. Note, however, that this import includes only asset information, which includes the requisite interview types and system information native to the system, but does not cover dynamic information, i.e., leak history, which will need to be manually filled in.

SHRIMP 4 imports the following sections of system information from SHRIMP 3: General System Information, Mains by Sizes, Services by Sizes, and Mains and Services by Decade. What is not transferred is plastic information, repairs scheduled, leaks on federal lands, unaccounted for gas, and additional information.

Once your SHRIMP 3 data has been imported, please verify your data to ensure that all needed information is filled out.



System Records

Creating a New System

Guidance will be provided for most question screens to help the user understand exactly what information SHRIMP 4 is asking for.

- Systems are the highest level of records in SHRIMP 4 and represent the complete system which will be summarized in the final DIMP Document. If you are creating a system, you will want to press the New System button, and will be presented with a page that will look much like this:

Systems > Add System
 ▶ Reports & Charts

▼ **System General Information**

Guidance:
 -You cannot change the Operator Name and DOT ID.
 -Enter System Name as you want it to appear in the written plan.
 -Enter system description if this is for only a portion of the distribution system named in System Name. This will be inserted into the scope section of the written plan. If this is for your whole system, leave the default of "Entire System".
 -Select the state in which this system operates from the drop down list.
 -Data Source is a text field in which you can enter anything. Where SHRIMP 4 asks for data from records, such as inspection and leak repair information, the data field should be used to record the source(s) relied upon to answer the questions. Anything you write in this field will be included in an attachment to the written plan.

Operator *

System Name

System Description

State of Operation

Office Address

Headquarters Address

▼ **General System Description (PART B1)**

Guidance:
 -Services refers to distribution lines that transport gas from a common source of supply to an individual customer, to two adjacent or adjoining residential or small commercial customers, or to multiple residential or small commercial customers served through a meter header or manifold. A service line ends at the outlet of the customer meter or at the connection to a customer's piping, whichever is further downstream, or at the connection to customer piping if there is no meter.
 -Mains refers to distribution lines that serve as a common source of supply for more than one service line.
 -For master meter and LP-piping system operators:
 -Under "Services" enter the number of units connected to the gas piping system.
 -Under "Mains" list the total miles of underground pipe by material.
 -For convenience, 1 mile = about 5,000 feet of pipe. Use this for all SHRIMP screens that ask for data about mains and services.
 -Where screens ask for information on leaks repaired, list all the leaks under mains.

Material	Mains	Services
Plastic	<input type="text"/>	<input type="text"/>
Unprotected, Bare	<input type="text"/>	<input type="text"/>
Cathodically Protected, Bare	<input type="text"/>	<input type="text"/>
Unprotected, Coated	<input type="text"/>	<input type="text"/>

- On this page you will fill out all of the base specifications for your system.
 - Operator – Your operator name as it appears in the PHMSA database. It cannot be changed. This should be preselected for you, but if not, just select your operator from the dropdown.
 - System Name – Type in your system's name here the way you want it to appear in your written Plan. You can go back and change it at any time.



- System Description – Enter a description of the portion of the system. If you are writing one plan for your entire system, leave it as “Entire System.” If it is only for a portion of your system, describe it so you and other users of this DIMP Plan will know what portion this Plan applies to. What you enter here will be written into the Scope section of the written Plan.
- State of Operation – Select the State in which your system operates and the Office Address for that system. If your system operates in more than one state, we encourage you to consider creating separate systems for each state.
- The next several sections will ask you to enter or confirm data about your system and its distribution piping. If data exists for your system but you are creating a Plan for only a portion of that system, you will have to change the data to reflect just that portion of your system to which this Plan will apply. Instructions explaining annual report information are attached to this user’s guide.



Material	Mains	Services
Plastic	<input type="text"/>	<input type="text"/>
Unprotected, Bare	<input type="text"/>	<input type="text"/>
Cathodically Protected, Bare	<input type="text"/>	<input type="text"/>
Unprotected, Coated	<input type="text"/>	<input type="text"/>
Cathodically Protected, Coated	<input type="text"/>	<input type="text"/>
Cast Iron, Wrought Iron	<input type="text"/>	<input type="text"/>
Ductile Iron	<input type="text"/>	<input type="text"/>
Copper	<input type="text"/>	<input type="text"/>
Other(1)	<input type="text"/>	<input type="text"/>
Other(2)	<input type="text"/>	<input type="text"/>
Total	0	0

▼ Mains By Size (PART B2)

Guidance: Report miles of mains in system by size.

Material	Unknown	2" or less	Over 2" thru 4"	Over 4" thru 8"	Over 8" thru 12"	Over 12"	Total
PVC	<input type="text"/>	0.000					
PE	<input type="text"/>	0.000					
ABS	<input type="text"/>	0.000					
Steel	<input type="text"/>	0.000					
Cast Iron, Wrought Iron	<input type="text"/>	0.000					
Ductile Iron	<input type="text"/>	0.000					
Copper	<input type="text"/>	0.000					
Other (1)	<input type="text"/>	0.000					
Other (2)	<input type="text"/>	0.000					
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000

▼ Services By Size (Part B3)

Guidance: Report number of services in system by size.

Material	Unknown	1" or Less	Over 1" thru 2"	Over 2" thru 4"	Over 4" thru 8"	Over 8"	Total
PVC	<input type="text"/>	0.000					
PE	<input type="text"/>	0.000					

IMPORTANT: Once you begin creating a record using **SHRIMP™** you can stop at any time and your data entered up to that point will be saved; however, data entered on the record will be saved **ONLY IF** you click on the **SAVE** button at the top right of the screen before logging off. Even if you think you will be away from the computer only a short time, click on **SAVE** even if you are not finished with data entry on that page – you can always go back and continue where you left off. If there is no activity for a period, **SHRIMP™** will disconnect you and you may lose any data you entered on that screen if you did not click on **SAVE**.

Once you have finished entering your system’s information, you should click the **SAVE & CLOSE** button in the upper right-hand corner of your screen. This will conclude the process of system creation.



Modifying a System

- If you need to view or modify a system information at any time, you can do so by going to the systems tab at the top or the systems list on your homepage, and then click the Manage button next to the system you want to view/modify.

Systems > List All
▶ Reports & Charts

Search records

-	System Name	State of Operation	Operator Name	DOT ID
<input type="button" value="Manage"/>	TEST	Ohio	ABC Energy	12345

Assessment Records

Creating a New Assessment

- Assessments are the second-highest level of record that you can create in SHRIMP 4 and contain all of the interviews, risk rankings and information for producing a DIMP document for each individual system.



- When you create an Assessment, you will be presented with a screen much like this one.

Guidance: When starting a fresh assessment, select the system you want to asses in the dropdown below, which lists your systems.
Put in the assessment version number and assessment year.

System Name	<input type="text" value="TEST"/>	DOT ID:	<input type="text" value="12345"/>
Plan Version	<input type="text"/>	Plan Year	<input type="text" value="2027"/>

System Overview

-

Headquarter's Contact Information	System's Contact Information
Street Address	Street Address
<input type="text" value="6000 Universal Blvd"/>	<input type="text" value="1 Cedar Point Drive"/>
City	City
<input type="text" value="Orlando"/>	<input type="text" value="Sandusky"/>
State	State
<input type="text" value="Florida"/>	<input type="text" value="Ohio"/>
Zip	Zip
<input type="text" value="32819"/>	<input type="text" value="44870"/>

- First, either type in, or select from the dropdown, the system that your Assessment will apply to.
- Next, input your plan version and if needed, your plan year.

NOTE: If you need to update this information, you can press the Update Plan Year/Version button under the version section on the assessment homepage at any time.

- Press the SAVE & CLOSE button once you are finished.



Filling Out an Assessment

- Once you have created your Assessment, press the Manage button next to it in the list.

Home
Systems
Assessments
Documents
User Guide

SHRIMP > Home

Welcome to SHRIMP 4.0

Guidance
Note: Please review the **Technical Notes** for information on the following topics:

- Using SHRIMP for the first time.
- Changing the Plan Year.

Below is a list of systems associated with your Operator ID. You can update system data by using the **Manage** button beside the system you want to update.

Below is a list of assessments that you have performed on your systems or are currently working on. In the assessment list below, choose the action you wish to perform on that assessment by clicking one of the buttons:

- Manage:** Choose this to review, correct, or revise the assessment.

If you want to view all of your completed plans, click the "DIMP Plans" button.
 If you want to add a new system, click the "New System" button.
 If you want to begin a new fresh assessment, click the "New Assessment" button.
 If you want to start a new assessment while maintaining your prior assessments information, click the "Manage" button on your most current assessment below and then press the "Copy Assessment" button.

New System
New Assessment
DIMP Plans

Systems

	System Name	State of Operation	Operator Name	DOT ID
Manage	TEST	Ohio	ABC Energy	12345

Assessments

Manage	IESI	2022		
Manage	IESI	2022		
Manage	IESI	2021	1.11	
Manage	IESI	2021		1234566



- Having done so, you will be presented with the following screen.

Guidance: When starting a fresh assessment, select the system you want to asses in the dropdown below, which lists your systems.
Put in the assessment version number and assessment year.

System Name	<input type="text" value="TESTI"/>	DOT ID:	<input type="text" value="12345"/>
Plan Version	<input type="text"/>	Plan Year	<input type="text" value="2027"/>

System Overview

Headquarter's Contact Information	System's Contact Information
Street Address	Street Address
<input type="text" value="6000 Universal Blvd"/>	<input type="text" value="1 Cedar Point Drive"/>
City	City
<input type="text" value="Orlando"/>	<input type="text" value="Sandusky"/>
State	State
<input type="text" value="Florida"/>	<input type="text" value="Ohio"/>
Zip	Zip
<input type="text" value="32819"/>	<input type="text" value="44870"/>

- This screen will show you your system overview, as well as several important buttons which we will go over now. These include the Required Settings, Preview/Finalize Plan, Resume, Add Text, and Copy Assessment buttons. Descriptions for each button are found on the next pages.



- **The Required Settings Button:** This button will take you to the required settings page for your assessment, which will need to be filled out in its entirety some time before your DIMP is finalized.

Required Settings > Edit Required Settings #699

System Information -- Manage Plan Settings (DIMP)

Interview: Manage Plan Settings

Section: New System

Description: Entire System

[Assessment Overview](#)

System Type *

- Natural Gas Distribution
- Master Meter
- Small LP Piping System (Fewer than 100 customers from a single source)
- LP Piping System (More customers from a single source)

Leak Location Procedure

Program Reevaluation Period *

- Every Year
- Every Two (2) Years
- Every Three (3) Years
- Every Four (4) Years
- Every Five (5) Years

State Reporting Agency

▼

Check If No Agency Applies

Choose external sources of information you used in your plan

⌵

Select up to 20 choices

Do you accept the default risk statement described in the Guidance and Commentary? *

▼

Please enter the names of those who are responsible for ensuring that the requirements of this Plan are carried out.

Guidance: The written plan will list the individual(s) who are responsible for ensuring that this written DIMP Plan is kept up to date. Individuals can be listed by name, by job title. Required actions listed in the plan should be listed in the Implementation Plan rather than here.

Name and/or Job Title	Responsible For	Edit
-----------------------	-----------------	------

No personnels found

[Add Personnel](#)

▼ Data Source



- **The Preview/Finalize Plan Button:** This button will become available once all other sections of your assessment are complete and will take you to the preview/finalize area of your assessment flow. This will be discussed further [here](#), in the context of finalizing your plan.
- **Update HQ Button:** This button will allow you to update the headquarters information of your system if it needs to be changed. Note that this button is also available on the system level.

Assessments > Edit Assessment #1956

▶ Reports & Charts

▼ **Current Address**

Current HQ Address [6000 Universal Blvd, Orlando, Florida 32819](#)

▼ **New Address**

Please, update new Headquarters address

Select a State/Region...
▼

Save & close Cancel

- **Resume Button:** This button is where you will go to fill out your individual interviews for this assessment.
- **Copy Assessment Button:** This button will only appear when you have fully completed your assessment. It **should not** be used until you have ensured that all information is correct, as it will make a new copy of your entire assessment, and you are ready to assessment your system for a subsequent plan year. This is a quick way to reduce duplicated effort for assessments that are very similar, and thus only require a limited amount of new information. Keep in mind, however, that you are responsible for the accuracy of your assessment's data and should ensure you have reviewed all data after copying an assessment.



- Press the Resume button to begin filling out the interviews for your assessments. Upon doing so, you will be presented with a screen much like this.

Assessment Overview

System Name DOT ID
 Plan Version Plan Year

USER ALERT: Please verify you have completely answered ALL interviews prior to going to the next step of risk ranking. In some situations you may need to click the 'Add Interview' button for any sub-threats that appear, even if there is a note stating 'No ____ found'. Currently not all required interviews & sub-threat interviews will show as 'Incomplete'.

Guidance: use the "add interview" button below to start the interview. If you want to assess the entire system, fill out one interview. If you want to section out your system to assess this threat on each section, fill out one interview for each section.

Full Report | Grid Edit | Email | More ▾ 1 Atmospheric Corrosion

<input type="checkbox"/>	Interview	Status	-	-	-
<input type="checkbox"/>	Atmospheric Corrosion ()	Incomplete	<input type="button" value="Edit"/>	<input type="button" value="Review"/>	<input type="button" value="Delete"/>

- Each of the tabs in the interview area may contain multiple interviews to complete, or none. If any are present, they will be marked with an incomplete until fully filled out. You should ensure that all interviews are complete as you will be unable to proceed further if they are not. If an interview that should be present is not, you should click the Add Interview button to add it to the threat tab.
- Clicking the Edit button on an interview will take you to the individual interview page for its associated threat, which is discussed further in the following section.
- Once all interviews are complete, then you should move onto the risk ranking page.



Filling Out Interviews

- In order to complete your assessment, you will need to fill out each incomplete interview present. Once you click on the Edit button of an incomplete interview, you will be presented with a page specific to that interview. An example can be seen below.

Atmospheric Corrosion > Edit Atmospheric Corrosion #4109

Threat Assessment – Atmospheric Corrosion (CORRAC)

Interview: Corrosion -> Atmospheric Corrosion

Section: TEST -> TEST

Description: Description ->

Assessment Overview

Scores

Relative Risk Score 1.2 Threat Score Total 1 Normalized Probability 1 Consequence Score 1.00 Leak History Factor 1.20 Incident Factor 1.00

Section

Section Name

Number of Facilities

Description

Now you will be asked to answer questions about your above ground and/or in-facility mains and services. For this risk ranking you will need the following records: Leak repair records and atmospheric corrosion inspection records.

Does New System have any facilities that require atmospheric corrosion inspections?

Data Source

Note: Please enter enough detail so that your Data Source reference is understandable when listed alone in a report.

Review

I certify that I've review/completed this section Incomplete

- PHMSA has published FAQs (Frequently Asked Questions) which state that “the written integrity management plan must contain a list of the sources used to demonstrate an understanding of the gas distribution system including documents, records, and information obtained from subject matter experts. These sources are used to identify the characteristics of the pipeline’s design, operations and environmental factors that are necessary to assess the applicable threats and risks to the distribution system. The information about the sources should include the name of the documents, the period covered by the documents, and the location and format (e.g., electronic, paper, or subject matter expert interview, etc.)” The rule is not so specific about data source documentation; however, this is good insight into what regulators may expect as far as data source information.



- In many of the threat assessment interviews the user is asked to enter historical data on leak repairs, locate tickets and other inspection and maintenance data. An example is shown below.

How many leaks caused by excavation damage were repaired during the years shown? (EXCLEaks)
Leak Repairs From PHMSA 7100.1-1

Year	Mains	Services
2017	<input type="text" value="3"/>	<input type="text" value="0"/>
2018	<input type="text" value="0"/>	<input type="text" value="0"/>
2019	<input type="text" value="0"/>	<input type="text" value="0"/>
2020	<input type="text" value="0"/>	<input type="text" value="0"/>
2021	<input type="text" value="0"/>	<input type="text" value="0"/>

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

Use this table to record the number of excavation caused damages that did not cause a leak but caused repair or replacement of facilities. "Excavation damage" is defined in §192.1001 as "any impact. Examples would include coating repairs, replacement of damaged, non-leaking facilities or repairs to cathodic protection facilities. Records of this type repair should be maintained in the future for use. See Appendix A Section A.5 of the Background Guide for additional information.

Year	Mains	Services
2016	<input type="text" value="0"/>	<input type="text" value="0"/>
2017	<input type="text" value="0"/>	<input type="text" value="0"/>
2018	<input type="text" value="0"/>	<input type="text" value="0"/>
2019	<input type="text" value="0"/>	<input type="text" value="0"/>
2020	<input type="text" value="0"/>	<input type="text" value="0"/>
2021	<input type="text" value="0"/>	<input type="text" value="0"/>

- Five years' data is the default, but you can change how many years of data SHRIMP 4 will accept in the Required Settings screen.
- On some screens SHRIMP 4 will already have entered some data if that data was present in SHRIMP 3 during data transfer. You should confirm that this data is correct and make any additions or changes.
- Sometimes **SHRIMP™** will be asking for records for the entire system and other times it will ask for records for just one section of the system. It is important that you look at this information when entering data to ensure the data you enter is the right information for that section.
- SHRIMP 4 asks for these data points to determine if there is a statistically significant upward or downward trend. SHRIMP 4 uses the Mann-Kendall trend test to identify trends. The result affects both the risk score for the section and the follow-up questions that will be asked.
- After the interview information is completed, press the SAVE & CLOSE button and move onto the next interview. Continue to do so until all other interviews are marked complete. Once this is done you will be able to move onto the Other Threats tab, and from there can complete the interview section as a whole.



Filling Out Risk Rankings

- Upon clicking the Risk Rankings button, you will be taken to the risk rankings area of your assessment, which will look much like this.

Guidance: this report shows the risk ranking scores for each of the interviews that you filled out in the prior step. Review how each interview ranks compared to each other. When you are ready to mitigate the risk for a specific threat, click on the 'Edit' button for that threat on the right side of the report.

Note: When you put in a user rank to override the SHRIMP ranking, please give it a moment and refresh your browser to see the update in the overall rank. The system needs to run through all rows of data to reorganize and re-rank everything, which can take up to a few minutes.

[Return To Assessment](#)

[Required Settings](#)

[Add Text](#)

[Implementation Plan](#)

[Preview/Finalize Plan](#)

Risk Ranking List

Full Report Grid Edit Email More ▾ 60 Risk Ranking records													
<input type="checkbox"/>	Interview	Rank	User Ranking	Shrimp Ranking	Relative Risk Score	Threat Score Total	Normalized Probability	Consequence Score	Leak History Factor	Incident Factor	Status Text		
<input type="checkbox"/>	Drugs and Alcohol (Test-)	1		1	19.22	5	10.00	1.5	1.025	1.25		Edit	View
<input type="checkbox"/>	Failure To Follow Procedures (Test-Test)	1		1	19.22	5	10.00	1.5	1.025	1.25	No AA Chosen No PM Chosen	Edit	View
<input type="checkbox"/>	Operator Qualification Revocation (Test-3)	1		1	19.22	5	10.00	1.5	1.025	1.25	No AA Chosen No PM Chosen	Edit	View
<input type="checkbox"/>	Blasting Damage (Test - 1)	4		4	18.86	8	8.88	1.7	1	1.25	No AA Chosen No PM Chosen	Edit	View
<input type="checkbox"/>	Blasting Damage (-)	5		5	18.86	8	8.88	1.7	1	1.25	No AA Chosen No PM Chosen	Edit	View

- A critical step in developing your written DIMP Plan is validating the results of the risk ranking. “Validating” means comparing the results of the SHRIMP 4 risk ranking model with what you, as the operator of system, believe are the highest risk areas in your system. Before you began developing your DIMP Plan you likely had a sense of which parts of your system, if any, were trouble free and which parts required extra attention. You undoubtedly know more about your system than SHRIMP 4 will ever know, even though SHRIMP™ attempts to ask all the relevant questions that affect the probability and consequences of a failure of your system due to any of the eight threats. If you disagree with the relative rankings produced by SHRIMP 4 it is most likely because you are aware of factors that SHRIMP 4 did not consider.
- To begin filling out your risk rankings, press the Edit button to the right of the risk ranking you want to work on, and you will be taken to the page for that ranking, where you will fill in the requested information.



- The following page shows the threat being ranked, its SHRIMP ranking, risk score, and additional/accelerated actions to assess the risk. You can override the SHRIMP rank if you choose to with your reasoning for doing so. You can also select and/or add the actions and performance measures you will do to mitigate this risk.

Risk Rankings > Edit Risk Ranking #26079

Section Overview

Interview: Internal Corrosion (TEST)

Assessment Overview

Risk Rankings

▼ Risk Scores

Relative Risk Score	Threat Score Total	Normalized Probability	Consequence Score	Leak History Factor	Incident Factor
1.00		1.00	1	1.2	1

▼ Rank

Guidance: decide if you agree with the system's rank below. If you do not agree, fill in the user rank field with the rank you think it should be and fill in the field that appears with your reasoning for overriding the system's rank.

Rank 1 User Ranking Shrimp Ranking 1

Ranked here, in part, for the following reasons:

The following were threat indicators:

- No threat indicators were found.

▼ No additional action required

No additional action required.

▼ Additional Actions

Based on the answers you provided to the threat assessment questions, SHRIMP suggests you consider one or more of the following Additional/Accelerated Actions:

Only those checked/entered will be included in the plan.

- Perform leakage surveys on an accelerated frequency.
- The System will Replace/Rehab (Miles/Services per year)
- Install pipe liners on this portion of the distribution system.
- Install coupons on and monitor this portion of the distribution system.

▼ Operator Additional Actions

Name	Description	-	-
No actions found			

No actions found

Add Action

▼ Performance Measures

Based on the answers you provided to the threat assessment questions, SHRIMP suggests you consider one or more of the following Performance Measures:

- Track the frequency of leaks or failures due to internal corrosion repaired each year per mile of main (and/or per service) in this section.
- Track the percentage of inspections that find failures due to internal corrosion per mile of main (and/or per service) in this section



At this point you should review the relative risk rankings produced by SHRIMP 4 and the explanation for that ranking. If you agree with the relative risk ranking for a segment, leave it unchanged; but if you believe SHRIMP 4's relative risk rank for one or more threat-segments is higher or lower in the list than it should be, you should use the risk re-ranking page to adjust its rank, as explained in the next section.

Rank

Guidance: decide if you agree with the system's rank below. If you do not agree, fill in the user rank field with the rank you think it should be and fill in the field that appears with your reasoning for overriding the system's rank.

Rank 1 User Ranking Shrimp Ranking 1

Ranked here, in part, for the following reasons:

The following were threat indicators:

- No threat indicators were found.

User Rank Explanation*

- Your explanation for your re-ranking will be written into your DIMP Plan created by SHRIMP 4 so that the reasons for your decision are recorded.
- All risk rankings must be filled out before you can move on to your implementation plan and generate your DIMP document.

Risk Re-Ranking

If you wish to re-rank your risk rankings, you can do so using the Risk Re-Ranking page. On this page you will see your risks listed initially in the order the system determined appropriate. In order to change these initial rankings, you will click and hold the left mouse button on the risk you wish to move, and drag it up or down to place it higher or lower in the order.



IBERVILLE PARISH NATURAL GAS SYSTEM
Elias Work

To re-rank your threats, click and hold your left mouse button on the threat you wish to re-rank, and drag it to your desired placement. When you release the button a window will appear, where you will define the reason for the change. To confirm your changes, press the confirm button in the upper right corner of the screen. To cancel, simply press the cancel button.

Rank #	Interview	Shrimp Ranking	Relative Risk Score	Threat Score Total	Normalized Probability	Consequence Score	Leak History Factor	Incident Factor
1	Other Outside Forces ()	1	7.18	9	7	1	1.026	1
2	Valves Experiencing Failure (Falling Equipment - Valves)	2	2.52	3	2.29	1	1.101	1
3	Valves Experiencing Failure (Falling Equipment - Valves)	3	2.52	3	2.29	1	1.101	1
4	Valves Experiencing Failure (Falling Equipment - Valves)	4	2.52	3	2.29	1	1.101	1
5	Atmospheric Corrosion ()	5	1.44	1	1	1.2	1.2	1
6	Internal Corrosion ()	6	1		1	1	1.2	1
7	External Corrosion (Cathodic Protected, Coated Steel - Entire System)	7	1.2		1	1	1.2	1
8	Other Equipment Experiencing Failure (Falling Equipment - Other)	8	1.1	1	1	1	1.101	1
9	Other Equipment Experiencing Failure (Falling Equipment - Other)	9	1.1	1	1	1	1.101	1
10	Other Equipment Experiencing Failure (Falling Equipment - Other)	10	1.1	1	1	1	1.101	1
11	Third Party Damages (Grady Crawford Construction -)	11	0.9	0	0.65	1.1	1	1.25
12	Third Party Damages (J. Diaz Construction -)	12	0.9	0	0.65	1.1	1	1.25
13	Third Party Damages (City of St. Gabriel -)	13	0.9	0	0.65	1.1	1	1.25
14	Third Party Damages (Baton Rouge Water Company -)	14	0.9	0	0.65	1.1	1	1.25
15	Third Party Damages (Sprinks Construction -)	15	0.9	0	0.65	1.1	1	1.25
16	Third Party Damages (Bear Industries -)	16	0.9	0	0.65	1.1	1	1.25
17	Damages (New System - Entire System)	17	0.76	0	0.61	1	1	1.25
18		18	0			1	1.1	1
19	Failure To Follow Procedures (New System - Entire System)	19	-1.02	0	-0.8	1	1.025	1.25

When you do so, the entire list will adjust automatically to the new risk rank placement. Please review and ensure that your Risks are all where you feel they should be in the ranking, and enter your reason for Re-Ranking. Having done so, please press the Save button to return to the previous page.

IBERVILLE PARISH NATURAL GAS SYSTEM
Elias Work

To re-rank your threats, click and hold your left mouse button on the threat you wish to re-rank, and drag it to your desired placement. When you release the button a window will appear, where you will define the reason for the change. To confirm your changes, press the confirm button in the upper right corner of the screen. To cancel, simply press the cancel button.

Rank #	Interview	Shrimp Ranking	Relative Risk Score	Threat Score Total	Normalized Probability	Consequence Score	Leak History Factor	Incident Factor
1	Other Outside Forces ()	1	7.18	9	7	1	1.026	1
2	Valves Experiencing Failure (Falling Equipment - Valves)	2	2.52	3	2.29	1	1.101	1
3	Valves Experiencing Failure (Falling Equipment - Valves)	3	2.52	3	2.29	1	1.101	1
4	Valves Experiencing Failure (Falling Equipment - Valves)	4	2.52	3	2.29	1	1.101	1
5	Atmospheric Corrosion ()	5	1.44	1	1	1.2	1.2	1
6	Internal Corrosion ()	6	1		1	1	1.2	1
7	External Corrosion (Cathodic Protected, Coated Steel - Entire System)	7	1.2		1	1	1.2	1
8	Other Equipment Experiencing Failure (Falling Equipment - Other)	8	1.1	1	1	1	1.101	1
9	Other Equipment Experiencing Failure (Falling Equipment - Other)	9	1.1	1	1	1	1.101	1
10	Other Equipment Experiencing Failure (Falling Equipment - Other)	10	1.1	1	1	1	1.101	1
11	Third Party Damages (Grady Crawford Construction -)	11	0.9	0	0.65	1.1	1	1.25
12	Third Party Damages (J. Diaz Construction -)	12	0.9	0	0.65	1.1	1	1.25
13	Third Party Damages (City of St. Gabriel -)	13	0.9	0	0.65	1.1	1	1.25
14	Third Party Damages (Baton Rouge Water Company -)	14	0.9	0	0.65	1.1	1	1.25
15	Third Party Damages (Sprinks Construction -)	15	0.9	0	0.65	1.1	1	1.25
16	Third Party Damages (Bear Industries -)	16	0.9	0	0.65	1.1	1	1.25
17	Damages (New System - Entire System)	17	0.76	0	0.61	1	1	1.25
18		18	0			1	1.1	1
19	Failure To Follow Procedures (New System - Entire System)	19	-1.02	0	-0.8	1	1.025	1.25



IBERVILLE PARISH NATURAL GAS SYSTEM
Elias Work

[Confirm New Rankings](#)

To re-rank your threats, click and hold your left mouse button on the threat you wish to re-rank, and drag it to your desired placement. When you release the button a window will appear, where you will define the reason for the change.
To confirm your changes, press the confirm button in the upper right corner of the screen. To cancel, simply press the cancel button.

Rank #	Interview	Shrimp Ranking	Relative Risk Score	Threat Score Total	Normalized Probability	Consequence Score	Leak History Factor	Incident Factor
1	Other Outside Forces ()	1	7.18	9	7	1	1.026	1
2	Valves Experiencing Failure (Failing Equipment - Valves)	2	2.52	3	2.29	1	1.101	1
3	Valves Experiencing Failure (Failing Equipment - Valves)	3	2.52	3	2.29	1	1.101	1
4	Valves Experiencing Failure (Failing Equipment - Valves)	4	2.52	3	2.29	1	1.101	1
5	Atmospheric Corrosion ()	5	1.44	1	1	1.2	1.2	1
6	Internal Corrosion ()	6	1		1	1	1.2	1
7	External Corrosion (Cathodic Protected, Coated Steel - Entire System)	7	1.2		1	1	1.2	1
8	Other Equipment Experiencing Failure (Failing Equipment - Other)	8	1.1	1	1	1	1.101	1
9	Other Equipment Experiencing Failure (Failing Equipment - Other)	9	1.1	1	1	1	1.101	1
10	Other Equipment Experiencing Failure (Failing Equipment - Other)	10	1.1	1	1	1	1.101	1
11	Third Party Damages (Grady Crawford Construction -)	11	0.9	0	0.65	1.1	1	1.25
12	Third Party Damages (J. Diaz Construction -)	12	0.9	0	0.65	1.1	1	1.25
13	Third Party Damages (City of St. Gabriel -)	13	0.9	0	0.65	1.1	1	1.25
14	Third Party Damages (Baton Rouge Water Company -)	14	0.9	0	0.65	1.1	1	1.25
15	Third Party Damages (Splinks Construction -)	15	0.9	0	0.65	1.1	1	1.25
16	Third Party Damages (Bear Industries -)	16	0.9	0	0.65	1.1	1	1.25
17	Damages (New System - Entire System)	17	0.76	0	0.61	1	1	1.25
18		18		0		1	1.1	1
19	Failure To Follow Procedures (New System - Entire System)	19	-1.02	0	-0.8	1	1.025	1.25

Selecting Additional/Accelerated Actions

- A/A (Additional/Accelerated) Actions are actions to minimize a threat to distribution integrity above and beyond what is required by pipeline safety regulations.
- Just because a threat section has a high relative risk rank does not mean that the section of pipe or equipment is unsafe. It only means that it has a higher risk relative to the sections ranked below it and a lower relative risk than sections ranked above it. It is up to the user to determine which sections require Additional Actions.
- Actions not required by regulations might include:
 - Pipeline replacement
 - Inspection of third-party excavation sites
 - Inspection of areas of erosion after significant rainfall
- A/A Actions could also include increasing the frequency of inspections or other activities above what is required by regulations, such as:
 - More frequent leak surveys
 - Additional public awareness activities



- For every threat except “Other,” **SHRIMP™** offers at least one possible A/A Action you can choose, which will then insert some pre-written text into the appropriate places in your written DIMP Plan.

▼ **Additional Actions**

Based on the answers you provided to the threat assessment questions, SHRIMP suggests you consider one or more of the following Additional/Accelerated Actions:

Only those checked/entered will be included in the plan.

- Perform leakage surveys on an accelerated frequency.
- The System will Replace/Rehab (Miles/Services per year)
- Install pipe liners on this portion of the distribution system.

The System will implement as follow:*

- Install coupons on and monitor this portion of the distribution system.

- In the description field that will appear, enter a more detailed description of the A/A Action. This text will be inserted into your written DIMP Plan under every threat-section where you select this A/A Action. It should be detailed enough that someone reading your DIMP Plan can understand what it is you have committed to do. It can also be a cross reference to an existing policy or program if you are already doing something that addresses this threat on this section of your system.

Selecting Performance Measures

- Except for master meter and small LP piping system operators, SHRIMP 4 will automatically include in your written Plan statements that you will track the following mandatory performance measures that are required of all utility and large LP piping system operators under the DIMP rule:
 - Number of hazardous leaks either eliminated or repaired as required by 49 CFR 192.703(c) (or total number of leaks if all leaks are repaired when found), categorized by cause;
 - Number of excavation damages;
 - Number of excavation tickets (receipt of information by the underground facility operator from the notification center);
 - Total number of leaks either eliminated or repaired, categorized by cause; and



- 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.

▼ **Performance Measures**

Based on the answers you provided to the threat assessment questions, SHRIMP suggests you consider one or more of the following Performance Measures:

- Track the frequency of leaks or failures due to internal corrosion repaired each year per mile of main (and/or per service) in this section.
- Track the percentage of inspections that find failures due to internal corrosion per mile of main (and/or per service) in this section
- Monitor the level of H2S in this section
- Monitor the quantity of corrosive liquids in this section
- Monitor the condition of coupons in this section

▼ **Operator Performance Measures**

Name	Description	of Tracking Value	-	-
------	-------------	-------------------	---	---

No actions found

[Add Performance Measure](#)

- For master meter and small LP system operators SHRIMP 4 will only include in your written Plan a statement that you will track the number of leaks eliminated or repaired by cause. That was the only performance measure that was required by the rule for these systems.
- The rule also stated that, for utility and large LP system operators, the written Plan must include any additional measures the operator determines are needed to evaluate the effectiveness of the operator’s DIMP in controlling each identified threat. To address this requirement, SHRIMP 4 requires you to select at least one threat-specific performance measure for each threat segment for which you have selected A/A Actions. SHRIMP 4 will offer at least one potential performance measure for each threat. Based on the A/A Action that you selected, SHRIMP 4 may recommend one or more performance measures, as appropriate, for measuring the effectiveness of an A/A Action.
- Just as with A/A Actions, you can create your own performance measures by clicking on “Add Performance Measure” and following a process just as you did to create Operator-defined A/A Actions. SHRIMP 4 will always offer at least one performance measure for you to choose from. The performance measure(s) you select will be inserted into the appropriate sections of your written DIMP Plan.



Implementation Plan

- Once the risk rankings section is fully complete, the Implementation Plan section will become available. Use the Implementation Plan button in the Navigation button section of your assessment overview or risk ranking pages to access the next step.
- On the Implementation Plan page, **you will have to fill out four (4) fields to complete this section.** Two for record keeping notes, one for Gap, and lastly, one for who will complete this assessment on an annual basis.

Implementation 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 Pan, including, at minimum, the location where new piping and appurtenances are installed and the material of which they are constructed.

TEST will implement as follows:

Be sure to include at least the timetable for initiating and completing these changes and the names and/or job titles of the persons responsible for making these changes.

B) Mechanical fitting failure data, including:

A) location of the failure in the system,

B) nominal pipe size,

C) material type,

D) nature of failure including any contribution of local pipeline environment,

E) fitting manufacturer,

F) lot number and date of manufacture, and

G) other information that can be found in markings on the failed fitting

TEST will implement as follows:

Be sure to include at least the timetable for initiating and completing these changes and the names and/or job titles of the persons responsible for making these changes.

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

A. The following gaps identified by TEST

TEST will implement as follows:

NO MORE GAPS

Any changes will be completed on an annual basis under the direction of:



- Section A-2 contains all Performance Measures from your previously completed Risk Rankings. To edit, simply select the Edit button to the right.

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

Full Report | Grid Edit | Email | More ▾ 15 Risk rankings

Rank	DIMP IMP - PM	Edit
1	For Corrosion > Internal Corrosion on the TEST the system will: <ul style="list-style-type: none"> Track the frequency of leaks or failures due to internal corrosion repaired each year per mile of main (and/or per service) in this section. The System will implement as follows: THIS IS A TEST	Edit
2	For Other Threats > Other Threats on the TEST the system will:	Edit
3	For Corrosion > Atmospheric Corrosion on the TEST the system will: <ul style="list-style-type: none"> Track the frequency of leaks or failures due to atmospheric corrosion repaired each year per mile of main (and/or per service) in this section. The System will implement as follows: THIS IS A TEST	Edit
4	For Corrosion > Other Metal on the TEST the system will:	Edit

- Section A-3 will host the Additional/Accelerated Actions from your Risk Ranking. Similar to Section A-2, you will have the ability to edit those risk rankings by selecting the Edit button to the right.

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

Full Report | Grid Edit | Email | More ▾ 15 Risk rankings

Rank	DIMP IMP-AA	Edit
1	For Corrosion > Internal Corrosion on TEST the system will:	Edit
2	For Other Threats > Other Threats on TEST the system will:	Edit
3	For Corrosion > Atmospheric Corrosion on TEST the system will: <ul style="list-style-type: none"> THIS IS A GIANT TEST 	Edit

Add Text Section

- If additional information needs to be added to a section before the DIMP is finalized, this can be done using the Add Text function while editing an assessment. This can be accessed with the Add Text button as seen below.

Assessment Overview

System Name TEST DOT ID 12345

Plan Version Plan Year 2027

[Risk Rankings](#)
[Required Settings](#)
[Add Text](#)
[Implementation Plan](#)
[Preview/Finalize Plan](#)

USER ALERT: Please verify you have completely answered ALL interviews prior to going to the next step of risk ranking. In some situations you may need to click the 'Add Interview' button for any sub-threats that appear, even if there is a note stating 'No ____ found'. Currently not all required interviews & sub-threat interviews will show as **Incomplete**.



- This button will bring you to the Add Text page. On this page, you may add additional Information to any of the included areas of the DIMP. In order to do so, type your desired title into the title field of the appropriate section, and then add whatever text you require into the entry field to the right of the title.

System Name [TEST](#) DOT ID: 12345

Plan Version Plan Year 2027

[Return To Assessment](#)

[Risk Rankings](#)

[Required Settings](#)

[Implementation Plan](#)

[Preview/Finalize Plan](#)

▼ **Additional Text For Plan**

Enter information you would like inserted into the plan.

* The information will be inserted into the chapter indicated.

* Nothing will be inserted if both the title and entry are blank.

For Chapter: Scope

Title

Entry

For Chapter: Definitions

Title

Entry

For Chapter: Knowledge of the Distribution

Title

Entry

For Chapter: Threat Assessment

Title

Entry

For Chapter: Risk Evaluation & Prioritization

Title

Entry

- Once you have added the text you wish to display in your DIMP, simply press the **SAVE & CLOSE** button at the top right of the page, and you will be taken back to the assessment.
- Once you fill out these four fields and review sections A-2 and A-3, the Implementation Plan is complete and the ability to go to the **Preview/Finalize Plan** page will be accessible.



Analysis of Performance Measures

Overview

This section discusses storing and analyzing the Performance Measure(s) that you selected to measure the effectiveness of each Additional/Accelerated Action.

Mann-Kendall Analysis

Mann-Kendall is a tool used by statisticians to assess whether a time-ordered data set exhibits an increasing or decreasing trend. **SHRIMP™** uses a Mann-Kendall analysis to identify trends in performance measure data. This is updated year by year as you update your Plan. If this data is being used as a metric, a table of the data you have entered will be shown followed by a table showing the heading “MK Metrics (S-Values).”

These S-Values are computed for all the years you have used **SHRIMP™** to generate your Plan. If you created a Plan for 2009 and then created a Plan for 2013, there will be an S-Value for the years 2009, 2010, 2011 and 2013. You must have at least five (5) years of data for the analysis to be performed.

Without going into details on the Mann-Kendall process, if the S-Value is greater than 10, the data being evaluated is considered to be “Increasing.” If it is 10 or less, it is considered to be “Not Increasing.” Values of 10 or less are not actually considered to indicate a statistically significant trend unless the Mann-Kendall test indicates that the trend is statistically significant. However, if your actions consistently reduce the S-Value year over year, that may be considered “improvement.” Therefore, any Additional/Accelerated Action(s) you perform should decrease the S-Value to be deemed effective.

S-Values are presented for all the years because it is possible that SHRIMP 4 may continue to conclude your risks are “Increasing” even if you have reduced the leaks, etc. If the S-Values are moving downward, your actions are having a positive effect.

Establishing a Baseline

The DIMP rule requires that your written Plan include a process for establishing a baseline for each Performance Measure. For performance measures where there is ten years or more of data, year 1 of the last 10 years is the baseline for the Mann-Kendall trend analysis.

For performance measures where there is less than ten years of data, year 1 of the data available is the baseline for the Mann-Kendall trend analysis.

The Written Plan

The analysis of performance measures is included in the written Plan as Section **11.5.6. ANALYSIS OF RISK BASED PERFORMANCE MEASURES.**

Note that there will be no analysis unless you have prior, finalized versions of your written Plan.



Finalizing Your DIMP Plan

Creating and Downloading Your Written DIMP Plan

At this point your DIMP Plan is complete. On the main assessment page, click the Preview/Finalize Plan button to display options for generating and downloading your written Plan.

▼ System Overview

Risk Rankings

Required Settings

Preview/Finalize Plan

Be sure to review “Required Settings” to make sure the System Name is as you wish it to appear in your Plan and double check that the system type is set correctly. If you are a master meter or small LP system operator you must check the appropriate system type, or your final Plan will include performance measures and reporting requirements that do not apply to your system.

If no version history has been pulled into the version history field, you should consider pressing the Add Version History button to add any existing version history for your DIMP Plan.

When everything is entered, click either “Generate DIMP Word” or “Generate DIMP PDF,” depending on your needs.

Return To Assessment

Risk Rankings

Required Settings

▼ Plan Information

System Name TEST DOT ID: 12345

Plan Version * Plan Year * Date Effective *

Added Text to Scope Section *

Previous Plan Version *

▼ Plan Version History

Version History was not pulled from SHRIMP 3, please populate with your version history from table 1 of your most recent completed plan.

Plan Version	Program Version	Date	Notes	By User	-	-
--------------	-----------------	------	-------	---------	---	---

No plan version notes found

Add Version History

▼ Documents

Please, only click Generate a single time. Wait for it to generate before clicking again.

Generate DIMP Word

Generate DIMP PDF

Upload User File

Document File	Date Created	User Uploaded	Generated By
---------------	--------------	---------------	--------------

No documents found



NOTE: As a DIMP Plan is a large and complex document, it can take some time to generate. Please be patient and do not click the generate buttons multiple times. After a minute or two, refresh the page, and you should see your complete DIMP document in the Documents table at the bottom of the page.

Make sure to review your DIMP Plan to make sure that it is formatted in the way you prefer, and that it contains all of the information needed to meet your requirements. Once this is done, the process is complete.



Appendix A – SHRIMP 4 Risk Ranking Model

SHRIMP 4 Relative Risk Model

The centerpiece of the Simple, Handy, Risk-based Integrity Management Plan (SHRIMP 4) is the risk ranking model. SHRIMP 4 uses an index model in which numeric scores are assigned based on answers provided by the user to questions asked by SHRIMP 4. The index model was developed by the APGA Security and Integrity Foundation (SIF) with guidance by an advisory group comprised of industry, federal, and state pipeline safety regulators.

Risk is the product of the probability of a failure times the consequences of a failure. The SHRIMP 4 relative risk model considers both the probability and consequences of a failure for each of the eight threats. The equation is as follows:

$$\text{Relative Probability} = \text{Probability Score} \times \text{Consequence Score} \times \text{Leak Cause Factor} \times \text{Incident Factor}$$

(Normalized to 1-10)
(1.0-1.5)
(1+% of LKS)
(1 or 1.25)

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

Probability Score

Probability Score is 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 Gas Piping Technology Committee (GPTC) DIMP guidance, as modified and added to by the SIF SHRIMP 4 Advisors. The weighting given to each possible answer is based on the knowledge and experience of the SHRIMP 4 Development Team and the SHRIMP 4 Advisors.

Threat	Sub-threat category	Maximum Score	Minimum Score	Incident Probability Factor
Natural Forces (SHRIMP 2)	No sub-threats	19	0	1
Natural Forces (SHRIMP 3)	Earth Movement due to Subsidence	27	0	1.25
	Earth Movement due to Frost heave	27	0	1.25
	Earth Movement due to Earthquakes	27	0	1.25



Threat	Sub-threat category	Maximum Score	Minimum Score	Incident Probability Factor
Natural Forces (SHRIMP 3) (Cont'd)	Earth Movement due to Landslides or Mudslides	27	0	1.1
	Lightning	19	0	1.1
	Flooding	19	0	1.1
	Scouring or washouts due to flowing water	19	0	1.1
	Falling chunks of snow or ice	19	0	1.1
	High winds or hurricanes or tornadoes	19	0	1.1
	Other Forces	19	0	1.1
Excavation Damage (SHRIMP 2)	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
Excavation Damage (SHRIMP 3)	Entire System	24	0	1.25
	Grouping by geographic area	24	0	1.25



Threat	Sub-threat category	Maximum Score	Minimum Score	Incident Probability Factor
Excavation Damage (SHRIMP 3) (Cont'd)	Grouping by operator crew or operator contractor damage	25	0	1.25
	Grouping by Third-Party Damage	25	0	1.25
	Blasting	9	0	1.25
	Mislocating Lines	22	0	1.25
Other Outside Forces	No sub-threats	12	0	1.0
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 sub-threats	5	1	1
Material/Welds/Joints	No sub-threats	5	1	1.1
Other	No sub-threats	None (User assigns rank)		1



Because there are different numbers of questions for each threat and sub-threat, the maximum possible score for each threat and sub-threat are different; therefore, the probability score for each threat-segment is normalized to a scale of 1 – 10 using this equation:

$$\text{Normalized probability score} = 1 + (9 \times (\text{sub-threat score} - \text{sub-threat minimum score}) / (\text{sub-threat maximum score} - \text{sub-threat minimum score}))$$

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

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 4 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 eight threats will result in death, injury, or significant property loss.

Reported Cause of Incidents and Failures 2017-2019	# of Incidents	# of Failures	Incidents/ 1000 Failures	Normalized to Corrosion
Corrosion	8	317,450	0.03	1
Excavation Damage	125	236,708	0.53	18
Incorrect Operations	29	56,054	0.52	17
Material Failure	32	159,187	0.20	7
Equipment Failure	13	543,487	0.02	1
Natural Force Damage	23	85,487	0.27	9
Other Outside Force Damage*	107	46,482	2.30	64
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 Threats¹ 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).

Consequence Score

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:

	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 Somewhat Greater About the Same	0.2 0.1 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 Outside Business Districts	0.15 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 Between one (1) and two (2) hours More than two (2) hours	0 0.025 0.05
CSQ-4	What would be the impact on the utility and its customers if this section were to fail?	Low Moderate High	0 0.05 0.1

¹ 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.



	Question	Possible Answers	Weighting
CSQ-5 (Geographic Areas)	<p>Could a failure of this section potentially affect schools, hospitals, nursing homes and other difficult to evacuate facilities?</p> <p>If yes, provide the user with the option to resection.</p>	<p>No</p> <p>Yes</p>	<p>0</p> <p>0.2</p>

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).
5. The proximity to schools, hospitals, nursing homes, and other difficult-to-evacuate facilities can result in an increase in consequence factor of up to 20% (1.0 to 1.2).

These weightings are based on the knowledge of the subject matter experts on the SHRIMP 4 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:

	Question	Possible Answers	Weighting
CSQ-EXC1	<p>Have the (crews/contractors/excavators) identified for this section caused damage that resulted in a reportable incident?</p>	<p>Yes</p> <p>No</p>	<p>0.3</p> <p>0</p>



	Question	Possible Answers	Weighting
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 Less serious About the same	0.2 0 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. Moderate likelihood of injury and/or property loss. Not likely to result in injury and/or property loss.	0.5 0.25 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 Somewhat Greater About the Same	0.2 0.1 0
EQIPCSQ-2	Does the equipment primarily affect the system located in the business district?	Within Business Districts Outside Business Districts	0.15 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 Between one (1) and two (2) hours More than two (2) hours	0 0.025 0.05
EQIPCSQ-4	What would be the impact on the utility and its customers if this equipment were to fail?	Low Moderate High	0 0.05 0.1

Leak Cause Factor

While most leaks are repaired without incident, the SHRIMP 4 Advisors felt that the user's 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 is less than 50, the national average is used rather than the user's 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 in the table below, taken from leak repair data reported to PHMSA by all distribution operators on Annual Report Form 7100.1-1.

Reported Cause of Failures 2017-2019

Threat	Failures	Percent	Leak History Factor
Corrosion	317,450	20%	1.20
Excavation Damage	236,708	15%	1.15
Incorrect Operations	56,054	4%	1.04
Material/Welds Failure	159,187	10%	1.10
Equipment Failure	543,487	35%	1.35
Natural Force Damage	85,487	5%	1.05
Other Outside Force Damage	46,482	3%	1.03
All Other Causes	114,172	7%	N/A*
Total	1,559,027	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.



Appendix B – Definition of Threats

From Instructions for the Distribution Annual Report Form 7100.1-1

Leak Cause Classifications

CORROSION FAILURE: leak caused by galvanic, atmospheric, stray current, microbiological, or other corrosive action. A corrosion release or failure is not limited to a hole in the pipe or other piece of equipment. If the bonnet or packing gland on a valve or flange on piping deteriorates or becomes loose and leaks due to corrosion and failure of bolts, it is classified as Corrosion. (Note: If the bonnet, packing, or other gasket has deteriorated to failure, whether before or after the end of its expected life, but not due to corrosive action, report it under a different cause category, such as G4 Incorrect Operation for improper installation or G6 Equipment Failure if the gasket failed)

NATURAL FORCE DAMAGE: leak caused by outside forces attributable to causes NOT involving humans, such as earth movement, earthquakes, landslides, subsidence, heavy rains/floods, lightning, temperature, thermal stress, frozen components, high winds (Including damage caused by impact from objects blown by wind), or other similar natural causes. Lightning includes both damage and/or fire caused by a direct lightning strike and damage and/or fire as a secondary effect from a lightning strike in the area. An example of such a secondary effect would be a forest fire started by lightning that results in damage to a gas distribution system asset which results in an incident.

EXCAVATION DAMAGE: leak resulting directly from excavation damage by operator's personnel (oftentimes referred to as "first party" excavation damage) or by the operator's contractor (oftentimes referred to as "second party" excavation damage) or by people or contractors not associated with the operator (oftentimes referred to as "third party" excavation damage). Also, this section includes a release or failure determined to have resulted from previous damage due to excavation activity. For damage from outside forces OTHER than excavation which results in a release, use Natural Force Damage or Other Outside Force, as appropriate.

OTHER OUTSIDE FORCE DAMAGE: leak resulting from outside force damage, other than excavation damage or natural forces such as:

- Nearby Industrial, Man-made or Other Fire/Explosion as Primary Cause of Incident (unless the fire was caused by natural forces, in which case the leak should be classified Natural Forces. Forest fires that are caused by human activity and result in a release should be reported as Other Outside Force)
- Damage by Car, Truck, or Other Motorized Vehicle/Equipment NOT Engaged in Excavation. Other motorized vehicles/equipment includes tractors, mowers, backhoes, bulldozers and other tracked vehicles, and heavy equipment that can move. Leaks resulting from vehicular traffic loading or other contact (except report as "Excavation Damage" if the activity involved digging, drilling, boring, grading, cultivation or similar activities.
- Damage by Boats, Barges, Drilling Rigs, or Other Maritime Equipment or Vessels so long



as those activities are not excavation activities. If those activities are excavation activities such as dredging or bank stabilization or renewal, the leak repair should be reported as “Excavation Damage”

- Previous Mechanical Damage NOT Related to Excavation. A leak caused by damage that occurred at some time prior to the release that was apparently NOT related to excavation activities, and would include prior outside force damage of an unknown nature, prior natural force damage, prior damage from other outside forces, and any other previous mechanical damage other than that which was apparently related to prior excavation. Leaks resulting from previous damage sustained during construction, installation, or fabrication of the pipe, weld, or joint from which the release eventually occurred are to be reported under “Pipe, Weld, or Joint Failure”. Leaks resulting from previous damage sustained as a result of excavation activities should be reported under “Excavation Damage” unless due to corrosion in which case it should be reported as a corrosion leak
- Intentional Damage/Vandalism means willful or malicious destruction of the operator’s pipeline facility or equipment. This category would include pranks, systematic damage inflicted to harass the operator, motor vehicle damage that was inflicted intentionally, and a variety of other intentional acts.
- Terrorism, per 28 C.F.R. § 0.85 General functions, includes the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.
- Theft. Theft means damage by any individual or entity, by any mechanism, specifically to steal, or attempt to steal, the transported gas or pipeline equipment.

PIPE, WELD, OR JOINT FAILURE: Leak resulting from a material defect within the pipe, component or joint due to faulty manufacturing procedures, design defects, or in-service stresses such as vibration, fatigue and environmental cracking. Material defect means an inherent flaw in the material or weld that occurred in the manufacture or at a point prior to construction, fabrication or installation. Design defect means an aspect inherent in a component to which a subsequent failure has been attributed that is not associated with errors in installation, i.e., is not a construction defect. This could include, for example, errors in engineering design. Fitting means a device, usually metal, for joining lengths of pipe into various piping systems. It includes couplings, ells, tees, crosses, reducers, unions, caps and plugs. Any leak that is associated with a component or process that joins pipe such as threaded connections, flanges, mechanical couplings, welds, and pipe fusions that leak as a result from poor construction should be classified as “Incorrect Operation.” Leaks resulting from failure of original sound material from force applied during construction that caused a dent, gouge, excessive stress, or other defect, including leaks due to faulty wrinkle bends, faulty field welds, and damage sustained in transportation to the construction or fabrication site that eventually resulted in a leak, should be reported as “Pipe, Weld or Joint Failure.”

EQUIPMENT FAILURE: leak caused by malfunctions of control and relief equipment including regulators, valves, meters, compressors, or other instrumentation or functional equipment,



Failures may be from threaded components, Flanges, collars, couplings and broken or cracked components, or from O- Ring failures, Gasket failures, seal failures, and failures in packing or similar leaks. Leaks caused by overpressurization resulting from malfunction of control or alarm device; relief valve malfunction; and valves failing to open or close on command; or valves which opened or closed when not commanded to do so. If overpressurization or some other aspect of this incident was caused by incorrect operation, the incident should be reported under “Incorrect Operation.”

INCORRECT OPERATION: leak resulting from inadequate procedures or safety practices, or failure to follow correct procedures, or other operator error. It includes leaks due to improper valve selection or operation, inadvertent overpressurization, or improper selection or installation of equipment. It includes a leak resulting from the unintentional ignition of the transported gas during a welding or maintenance activity.

OTHER CAUSE: leak resulting from any other cause not attributable to the above causes. A best effort should be made to assign a specific leak cause before choosing the Other Cause category. An operator replacing a bare steel pipeline with a history of external corrosion leaks without visual observation of the actual leak, may form a hypothesis based on available information that the leak was caused by external corrosion and assign the Corrosion cause category to the leak.