

**Pipeline Replacement Program Plan**  
**Cascade Natural Gas Corporation**  
**2016**

*in accordance with*  
**Policy Statement in Docket No. UG-120715**

## Required Contents: Checklist and Table of Contents

<b>Policy Statement</b>		<b>Section/Page</b>
<p>The pipe replacement program plan should consist of three parts:</p> <p>(1) a “master” plan for replacing all pipes with an elevated risk of failure;</p>	<p>In support of its pipe replacement program plan, each gas company should demonstrate that the type of pipe to be replaced under its program presents an elevated risk of cracking, leakage, breakage or other failure. The gas company should explain why the particular type(s) of pipe presents an elevated risk, such as the physical qualities of the pipe as manufactured (e.g., low ductile plastic pipe), the condition of the pipe as installed (e.g., poor soil conditions) or as maintained (e.g., no cathodic protection), the age of the pipe, etc.</p> <p>The gas company should also provide detailed analysis and explanation demonstrating why the pipe it seeks to replace is appropriate for replacement, compared to other pipe. To the extent practical, the gas company should quantify and explain the degree to which risk of failure is elevated for such pipe, compared to other pipe.</p>	<p><b>Section 1 – Master Plan</b></p> <p>Page 3</p>
<p>(2) a two-year plan that specifically identifies the pipe replacement program goals for the upcoming two year period;</p>	<p>The first pipe replacement program plan shall be filed by June 1, 2013, covering planned pipe replacement through 2015.</p>	<p><b>Section 2 – Two-Year Plan</b></p> <p>Page 5</p>
<p>and (3) if applicable, a plan for identifying the location of pipe that presents elevated risk of failure.</p>	<p>A prudent pipe replacement program should contain a plan for identifying the location of elevated risk pipe; to the extent the gas company does not presently know the location. The plan should include a timetable under which the gas company will know the location of its elevated risk pipe.</p> <p>The Commission will not require a gas company to know the location of all of its elevated risk pipe as a prerequisite for having a pipe replacement program consistent with the policy statement. A pipe replacement program may focus initially on pipe for which the gas company knows the location.</p>	<p><b>Section 3 – Identification Plan</b></p> <p>Page 6</p>

## **Introduction**

On December 31, 2012, the Washington Utilities and Transportation Commission issued a policy statement in Docket UG-120715 for the accelerated replacement of natural gas pipeline facilities with elevated risk. This policy statement requires each gas company requesting a special pipe replacement cost recovery mechanism (CRM) to file with the Commission a pipe replacement program plan containing the following elements:

1. *A “master” plan for addressing all pipes with an elevated risk of failure*
2. *A two-year plan that specifically identifies the goals for the upcoming two year period*
3. *A plan for identifying the location of pipe that presents elevated risk of failure*

## **Section 1 -Master Plan**

This Master Plan will serve as the guide that Cascade Natural Gas Corporation (Cascade) will use to determine which pipelines should be addressed as part of the Pipe Replacement Program. This Master Plan will describe the possible risks that can be associated with a pipeline, how the pipelines are analyzed to assess and quantify risks, how the pipelines to be addressed are identified, and how information for identified and new risks is obtained. The Master Plan will also describe the role that Cascade’s Distribution Integrity Management Plan (DIMP) and MAOP Determination & Validation Plan (MAOP Plan) play in the Pipe Replacement Program.

### *Possible Risks*

Cascade operates pipelines that are classified as Pre-CNG piping systems. Pre-CNG pipelines are distribution systems that were constructed to distribute manufactured gas or natural gas. These pipelines were originally installed, owned, operated, and maintained by others prior to 1955. Cascade acquired a number of these systems in the late 1950s and throughout the 1960s. The condition of the pre-CNG pipe is bare steel or coal tar wrapped. This pipe is of concern since it is at least 60 years old and lacked cathodic protection until the early 1970s, leaving the pipe suspect to corrosion risk. The extent of this pipe varies throughout Cascade systems and depends on the history of the system and how it was acquired by Cascade. Gas distribution systems in Washington where the majority of this pre-CNG pipe resides are in the towns of Longview, Anacortes, and Shelton.

Cascade has prepared an MAOP Plan for all high pressure (HP) distribution and transmission pipelines in the state of Washington. The purpose of this plan is to determine and validate the MAOP of all HP distribution and transmission pipelines for which there is insufficient documentation to confirm the current MAOP. The plan assigns risk based on missing data and prioritizes pipelines to be addressed. Pipelines with risk due to missing data will also be incorporated into Cascade’s DIMP.

In addition to the risks inherent with Pre-CNG pipelines and pipelines with missing data, Cascade's pipelines are exposed to risks due to the following factors:

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

Cascade's DIMP and MAOP Plan describe these risks in greater detail. Cascade's DIMP and MAOP Plan are on file with the Commission's Pipeline Safety Division.

#### *Analysis and Quantification*

As part of Cascade's DIMP, a GIS-based model has been created and is maintained. Information collected as part of DIMP is input into the model, where it is analyzed to find areas of concern and also trends. This allows Cascade to quantify the risk associated with each pipeline based on factors that are pertinent to this Pipe Replacement Program. Cascade's DIMP contains a more detailed explanation of this process.

Cascade's MAOP Plan will be updated on an annual basis and all new information will be incorporated. Risk prioritization in the plan will be updated as new information is available. This information will also be incorporated into Cascade's DIMP.

#### *Identification of Pipelines for Replacement*

DIMP model results and MAOP Plan results are used to identify the locations of pipelines that should be addressed in the Pipe Replacement Plan.

For pipelines identified by DIMP, samples of the DIMP model outputs for the areas identified in Section 2 of this document are included in Appendix A. Once replacement locations are identified, specific projects within these areas are planned and prioritized based on coordination with district and on-site personnel considered to be Subject Matter Experts (SMEs). This helps ensure the replacement of the higher risk pipelines within the identified areas.

#### *Obtaining New Information*

Cascade obtains new information for their DIMP model and Pipe Replacement Plan through the following methods:

1. Observing trending on DIMP – the DIMP model is analyzed on a yearly basis. As part of this analysis trends are identified and the plan and/or model are modified as needed.
2. Company forms that gather information on exposed pipelines – every time a Cascade pipeline is exposed an Integrity Management Dig Report – Form 625 is completed. Additionally, all leaks are documented with a Leak Investigation – Form 293. Information from these forms is input into the DIMP model.
3. MAOP Plan – As information is gathered on pipelines with missing data, that information will be incorporated in the MAOP Plan.
4. Continuing Subject Matter Expert (SME) panel meetings – SME panel meetings are held on an as appropriate basis, at least once annually. Information from the panel meetings is used to validate the DIMP model and new information is input into the DIMP model.
5. Updating model annually – Cascade’s DIMP model is updated annually. Results of the model analysis are used to prioritize pipeline replacement projects.

Cascade’s DIMP and MAOP Plan describe these methods in greater detail.

## **Section 2 - Two Year Plan**

Cascade’s two year plan has been divided into two separate time periods. Work to be performed that qualifies for the Pipe Replacement Program includes replacement, in situ testing, pressure testing, exposing and verifying fittings, and downrating. Work has been divided into capital replacement projects and Operations & Maintenance (O&M) work. The time periods and the work that are proposed for each are listed below.

### *November 1, 2015 – October 31, 2016 – Capital Replacement Projects*

PROJECT	DISTRICT	TYPE OF PIPE TO BE REPLACED
CRM RPL ANACORTES BARE STEEL	MT. VERNON	BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM RPL LONGVIEW BARE STEEL	LONGVIEW	BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM VANCE CREEK EXPOSURE REPLACE	ABERDEEN	EXPOSED PIPE (CORROSION) IN ADDITION TO MODERATE (ORANGE) RISK IN DIMP
CRM CAMP CREEK EXPOSURE REPLACEMENT	ABERDEEN	EXPOSED PIPE (CORROSION) IN ADDITION TO MODERATE (ORANGE) RISK IN DIMP
CRM 3" BURLINGTON HP LINE REPL	MT. VERNON	PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM WENATCHEE RIV RR BRIDGE RPL	WENATCHEE	PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM 4" GRANDVIEW HP LINE #3 RPL	YAKIMA	PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM BELLINGHAM BRIDGE CROSSINGS RMV	BELLINGHAM	PRE-CNG PIPE - IDENTIFIED HIGH (RED) & MODERATE (ORANGE) RISK IN DIMP
CRM KELSO GRADE ST BRIDGE RELOCATE	LONGVIEW	EXPOSED PIPE SUSCEPTIBLE TO CORROSION RISK - MODERATE (ORANGE)
CRM COLLEGE PLACE CARS PROJECT	WALLA WALLA	MODERATE (ORANGE) RISK IN DIMP
2 IN STEEL IP BORE BELFAIR PL	KENNEWICK	MODERATE (ORANGE) RISK IN DIMP
CRM 6" NOB HILL REPLACEMENT	YAKIMA	IDENTIFIED HIGH (RED) RISK IN DIMP
KENNEWICK RR CROSS NEAR KAMIAKIN	KENNEWICK	MODERATE (ORANGE) RISK IN DIMP
CRM SHELTON 4" IP BRIDGE REPLACE	ABERDEEN	EXPOSED PIPE (CORROSION) IN ADDITION TO MODERATE (ORANGE) RISK IN DIMP
CRM SUNNYSIDE 2" IP MAIN RPL	YAKIMA	PROJECT WILL REPLACE HOUSE PIPING SERVING MULTIPLE BUILDINGS
CRM KELSO MILL STREET REPLACEMENT	LONGVIEW	BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM REL ZILLAH @ MEYERS BRIDGE RD	YAKIMA	HIGH (RED) RISK IN DIMP
4"HP SHORTED CASING - 1ST & PARK	ABERDEEN	HIGH (RED) RISK IN DIMP

These projects were identified through Cascade’s DIMP and MAOP Plan and are both intermediate pressure (IP) (< 60 psig) and high pressure (HP).

*November 1, 2015 – October 31, 2016 – O&M*

PROJECT	DISTRICT	WORK TO BE PERFORMED
8" & 12" BREMERTON TRANSMISSION LINE	BREMERTON	IN SITU TESTING AT 15 LOCATIONS
8" BELLINGHAM TRANSMISSION LINE #1	BELLINGHAM	IN SITU TESTING AT 35 LOCATIONS
16" FREDONIA TRANSMISSION LINE FITTINGS	MT. VERNON	IN SITU TESTING AT 25 LOCATIONS
16" MARCH POINT TRANSMISSION LINE FITTINGS	MT. VERNON	IN SITU TESTING AT 12 LOCATIONS
8" MARCH POINT TRANSMISSION LINE (0.188")	MT. VERNON	IN SITU TESTING AT 21 LOCATIONS
8" MARCH POINT TRANSMISSION LINE (0.250")	MT. VERNON	IN SITU TESTING AT 10 LOCATIONS
8" ANACORTES TRANSMISSION LINE	MT. VERNON	IN SITU TESTING AT 60 LOCATIONS
16" N. WHATCOM TRANSMISSION LINE	BELLINGHAM	EXPOSE AND VERIFY FITTINGS
4" NORTH LYNDEN HP LINE	BELLINGHAM	EXPOSE AND VERIFY FITTINGS
8" KITSAP LINE (PHASE 1)	ABERDEEN	EXPOSE AND VERIFY FITTINGS
12" KITSAP HP LINE	ABERDEEN	EXPOSE AND VERIFY FITTINGS
4" OLYMPIC VIEW HP LINE	BREMERTON	EXPOSE AND VERIFY FITTINGS
4" OHELLO TRANSMISSION SEGMENT AND HP LINE	WENATCHEE	EXPOSE AND VERIFY FITTINGS

These projects were identified through Cascade’s MAOP Plan and are both intermediate pressure (IP) (< 60 psig) and high pressure (HP).

*November 1, 2016 – October 31, 2017 – Capital Replacement Projects*

PROJECT	DISTRICT	TYPE OF PIPE TO BE REPLACED
CRM RPL ANACORTES BARE STEEL	MT. VERNON	BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM RPL LONGVIEW BARE STEEL	LONGVIEW	BARE STEEL/PRE-CNG PIPE - IDENTIFIED HIGH (RED) RISK IN DIMP
CRM RPL; 12" STL HP, KELSO	LONGVIEW	HIGH (RED) RISK IN DIMP

*November 1, 2016 – October 31, 2017 – O&M*

PROJECT	DISTRICT	WORK TO BE PERFORMED
8" CENTRAL WHATCOM TRANSMISSION LINE	BELLINGHAM	IN SITU TESTING AT 85 LOCATIONS
8" ANACORTES TRANSMISSION LINE	MT. VERNON	IN SITU TESTING AT 70 LOCATIONS
12" SOUTH LONGVIEW HP LINE	LONGVIEW	IN SITU TESTING AT 10 LOCATIONS
8" BELLINGHAM TRANSMISSION LINE	BELLINGHAM	PRESSURE TEST TO REESTABLISH MAOP
8" MARCH POINT TRANSMISSION LINE	MT. VERNON	PRESSURE TEST TO REESTABLISH MAOP
4" SOUTH MOSES LAKE HP LINE	WENATCHEE	PRESSURE TEST TO REESTABLISH MAOP
4" NORTHWEST PASCO HP LINE	KENNEWICK	PRESSURE TEST TO REESTABLISH MAOP
4" GLADE ROAD HP LINE	KENNEWICK	PRESSURE TEST TO REESTABLISH MAOP
2" BURBANK HP LINE	KENNEWICK	PRESSURE TEST TO REESTABLISH MAOP
8" ANACORTES TRANSMISSION LINE	MT. VERNON	EXPOSE AND VERIFY FITTINGS
6" NORTH OAK HARBOR HP LINE	MT. VERNON	EXPOSE AND VERIFY FITTINGS
8" ATTALIA TRANSMISSION LINE	KENNEWICK	EXPOSE AND VERIFY FITTINGS
4" PLYMOUTH HP LINE	KENNEWICK	EXPOSE AND VERIFY FITTINGS
BELLINGHAM HP DISTRIBUTION SYSTEM	BELLINGHAM	DOWNRATE

The projects listed in these tentative schedules are based on the best information available at this time. As more information becomes available and the DIMP model and MAOP

Plan are updated, the prioritization of the projects may change. DIMP output for replacement projects is shown in Appendix A.

### **Section 3 - Plan for Identifying the Location of Pipe that Presents Elevated Risk of Failure**

Cascade identifies the location of pipe that presents an elevated risk of failure through the DIMP plan and model and reviewing records to establish/validate MAOP as part of the MAOP Plan. DIMP calls for information to be gathered on exposed pipe, leaks to be tracked, and SME knowledge to be incorporated into the plan. The MAOP Plan gathers information through records search, materials testing, pressure testing, and field inspection. DIMP and the MAOP Plan have sufficient flexibility to identify and adjust to trends and new sources of information. Yearly analyses are performed that quantify the risks on each pipeline.

As outlined in Cascade's DIMP, additional or accelerated (A/A) actions are implemented when existing compliance activities and procedures need to be supplemented to address risk identified to the integrity of Cascade's distribution system. A/A actions that may be implemented to mitigate risk are outlined in Cascade's DIMP, as well as the requirements for implementation and documentation.

In instances where unknown pipe properties are encountered (i.e. pipe grade, wall thickness, material type, etc.) Cascade takes actions to obtain unknown properties. These actions include, but are not limited to, removal and sampling, in-situ testing, and pipeline replacement.