Columbia Gas Regulator Risk Model

The Regulator Risk Model is an SME based process that allows Columbia Gas of Massachusetts (CMA) to assess, rank and manage the risk profile associated with regulator stations that includes all district regulator stations and points-of-delivery. It specifically enables Field Engineering and Systems Operations to evaluate the overall risk, across multiple variables, of each station on an annual basis and formulate repair vs. replacement strategies if any action is required at all. The model is used to facilitate regulator threat assessment and remediation within CMA's Distribution Integrity Management Plan (DIMP). The model is updated annually and reviewed every year by the DIMP Steering Committee.

The model is used to aggregate point scores for inputs regarding factors such as station capacity, physical labor for operations, environmental, health and safety considerations, design, leakage, corrosion, security, and station component failures to name a few. In total, there are 40 factors evaluated annually that make up the total risk score. Further explanation of these factors can be found in CMA's DIMP Plan along with the Definitions and Tables tabs within the model itself.

Risk evaluation within the model uses 1st and 2nd standard deviation above the mean to establish low, medium and high levels of risk. Risk is correlated to the risk scores as shown in Table I:

Table I. Regulator Risk Assignment

Risk Score	Risk
Less than or Equal to 1x Standard Deviation Above the Mean	Low
Between 1x and 2x Standard Deviations Above the Mean	Medium
Greater than 2x Standard Deviation Above the Mean	High

As part of the regulator risk evaluation and DIMP processes, subject matter expert groups review the individual factors that drive the total regulator station score and make remedial actions to either lower the risk or eliminate the risk altogether. The priority focus on station evaluation and remedial actions is made on regulator stations with "High" risk scores, with expectations to reduce or eliminate the risk within a planning horizon established under the DIMP, then working toward medium and low risk scoring stations. Remedial actions can range from specific incidental improvements within a station, targeting specific activities to improve the total risk score to full on replacement. It is important to understand that remedial actions are also determined by other factors than just risk reduction activities such as the coordination with other activities such as infrastructure replacement, system reliability projects, and operation and maintenance activities. For example an outcome from the evaluation of a particular station may provide a recommendation of "Complete Replacement" for that facility even though its relative risk score is low. In this case the facility could be replaced or eliminated through a future replacement project or grouped in with a future (IRP) or Infrastructure Replacement Program related project for either replacement or elimination. Until a station is replaced or eliminated through a capital project in this manner, it would not be uncommon to see the recommendation from the previous year call for complete replacement as well. In order to understand the risk and remedial actions planned for each station, the risk model results for both 2016 and 2017 are included in Attachments 1 and 2 respectively. Upon reviewing the results of the respective risk models, it appears that the "(Previous Year) Recommended Actions" between the 2016 and 2017 models was errantly updated. Attachment 3 shows a summary of the risk scores, risk rank and recommended actions for the fourteen stations supplying gas to the impacted area for calendar years 2016 and 2017. The summary shows that there were no replacement recommendations since 2015 for the identified stations. Moreover, the model indicates that none of the fourteen stations had a risk ranking of higher than "Medium" An analysis of four stations that showed a significant downward trend in risk score is also included in Attachment 3.