

## 7. THREAT IDENTIFICATION (§ 192.1007(b))

In evaluating the integrity and risk of the distribution system, the following threats are considered:

- 1) *Corrosion* – resulting from a hole in the pipe or other component that was caused by galvanic, bacterial, chemical, stray current, or other corrosive action.
- 2) *Natural Forces* – resulting from earth movements, earthquakes, landslides, subsidence, lightning, heavy rains/floods, washouts, flotation, mudslide, scouring, temperature, frost heave, frozen components, high winds, or similar natural causes.
- 3) *Excavation Damage* – resulting from damage caused by earth moving or other equipment, tools, or vehicles. Include leaks from damage by operator’s personnel or contractor or people not associated with the operator.
- 4) *Other Outside Force Damage* – caused by fire or explosion and deliberate or willful acts, such as vandalism and due to vehicle damage.
- 5) *Pipe, Weld, or Joint Failure* – resulting from failure of original sound material from force applied during construction that caused a dent, gouge, excessive stress, or other defect that eventually resulted in a leak. This includes those due to faulty wrinkle bends, faulty field welds, and damage sustained in transportation to the construction or fabrication site, resulting from a defect in the pipe material, component, or the longitudinal weld or seam due to faulty manufacturing procedures.
- 6) *Equipment Failure* – resulting from malfunction of control/relief equipment including valves, regulators, or other instrumentation; stripped threads or broken pipe couplings on nipples, valves, or mechanical couplings; or seal failures on gaskets, O-rings, seal/pump packing, or similar leaks.
- 7) *Incorrect Operation* – resulting from inadequate procedures or safety practices, or failure to follow correct procedures, or other operator error.
- 8) *Other* – resulting from any other cause, such as exceeding the service life, not attributable to the above causes.

Threat category is a facility grouping element in the Data-Driven Risk Model, which allows the risk contribution for each threat to be calculated for a given asset. This information is used to determine the risk drivers when evaluating the risk for a given asset.

For the SME Risk Model, UGI determines for each asset group which threats could likely affect the current or future integrity of that asset group. The threats to UGI’s distribution assets are represented by the columns in the Model (Appendix B) and are summarized into the major categories listed above.

If multiple threats to an asset are possible, all will be identified. One or more threats to an asset group are identified if there is reasonable evidence in the data or in the SME experience to indicate it is possible. If data used for threat identification and categorization are insufficient or suspect, SMEs may 1) evaluate the extent of the threat based on their level of experience, or, 2) consider each threat covered by the missing or insufficient data to apply to the entire group being evaluated until the knowledge development process described in Section 6.4 produces information sufficient to conclude otherwise. If needed data is missing, SME input serves to establish an