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**DEPARTMENT OF TRANSPORTATION**

**Pipeline and Hazardous Materials Safety Administration**

**[Docket No. PHMSA-2016-0131]**

**Pipeline Safety: Deactivation of Threats**

**AGENCY:** Pipeline and Hazardous Materials Safety Administration (PHMSA), DOT.

**ACTION:** Notice; issuance of advisory bulletin.

**SUMMARY:** PHMSA is issuing this Advisory Bulletin to inform owners and operators of gas transmission pipelines that PHMSA has developed guidance on threat identification and the minimum criteria for deactivation of threats, as established by a previously issued rule. This Advisory Bulletin also provides guidance to gas transmission pipeline operators regarding documenting their rationale of analyses, justifications, determinations, and decisions related to threat deactivation.

**FOR FURTHER INFORMATION CONTACT:** Allan Beshore by phone at (816) 329-3811 or email at [allan.beshore@dot.gov](mailto:allan.beshore@dot.gov). All materials in this docket may be accessed electronically at <http://www.regulations.gov>. Information about PHMSA may be found at <http://www.phmsa.dot.gov>.

**SUPPLEMENTARY INFORMATION:**

**I. Background**

A critical element in an integrity management (IM) program is the identification of threats to pipeline integrity. As required by section 192.911(c), an IM program must contain “[a]n identification of threats to each covered pipeline segment, which must include data integration and a risk assessment. An operator must use the threat identification and risk

assessment to prioritize covered segments for assessment (section 192.917) and to evaluate the merits of additional preventive measures and mitigative measures (section 192.935) for each covered segment.” Further requirements detailed in section 192.921(a) state, “[a]n operator must select the [assessment] method or methods best suited to address the threats identified to the covered segment.” The threats to a particular pipeline segment dictate the type of assessments the operator must perform to fulfill the requirements of section 192.921(a).

According to the Standard established by the American Society of Mechanical Engineers (ASME), ASME B31.8S-2004, Section 2.2, an operator must consider nine individual threat categories as part of an IM program. As stated by ASME B31.8S-2004, Section 5.10, an IM program should provide criteria for eliminating a threat from consideration during a risk assessment; however, 49 CFR Part 192—Subpart O does not include provisions for the permanent elimination of threats. An operator, therefore, must continually consider all threats in the evaluation of their IM program through periodic reviews and assessments, as required by section 192.937.

PHMSA acknowledges that threats may be categorized as active, requiring an integrity assessment, or inactive, meaning that during a specific assessment cycle the threat does not trigger an integrity assessment, per section 192.921(a). Operators, however, must understand that threats to a pipeline are not static, but vary over time. Changes in threats can occur suddenly, as in the case of catastrophic outside forces like hurricanes, earthquakes, or down-slope land movements, or they can be gradual changes, such as the introduction of new wet-production gas sources into a previously dry gas environment. Issues may also develop into active threats over time, such as coating degradation that allows stress corrosion cracking or external corrosion to develop. In other cases, threats may become inactive over time due to

pipeline replacement programs, the implementation of effective preventative actions, or other improvements to systems.

The periodic review required by section 192.937 for a mature IM plan must include the re-analysis of the nine threat categories to determine status changes for active or inactive threats. An operator must continually monitor operations and maintenance (O&M) and other activities, integrating relevant information during a threat analysis that might indicate a change in the status of a threat. Some operators inappropriately label threats as inactive after they are eliminated from consideration during prior reviews and assessments, ignoring the continuous supply of new information provided during routine O&M activities.

Some operators have opted to eliminate threats from consideration based on a lack of data, including missing, incomplete, or unsubstantiated data. Using insufficient data to eliminate a threat is not technically justified and is contrary to the guidance in ASME B31.8S-2004, Appendices A1-A9. Each of these appendices includes language that states, “[w]here the operator is missing data, conservative assumptions shall be used when performing the risk assessment or, alternatively, the segment shall be prioritized higher.” Additionally, section 192.947(d) requires that operators maintain, “[d]ocuments to support any decision, analysis and process developed and used to implement and evaluate each element of the baseline assessment plan and integrity management program.” Section 192.947(d) further states, “[d]ocuments include those developed and used in support of any identification, calculation, amendment, modification, justification, deviation and determination made, and any action taken to implement and evaluate any of the program elements.”

PHMSA provides the following guidance for determining the active or inactive status of the nine threat categories, with the understanding that the status of a threat will change over time:

## **Time-Dependent Threats**

### **1. External Corrosion**

For steel pipelines, the threat of external corrosion may never be eliminated.

### **2. Internal Corrosion**

An operator should consider the past operational history of the pipeline, including, but not limited to: upset conditions, gas monitoring (including partial-pressure analysis), bacterial culture tests, flow direction and rates, gas sources, solid and liquid analyses, critical angles and liquid holdup points, pigging and other cleaning history, the presence of internal coatings, chemical treatments, and internal pipeline inspection reports.

After consideration of operational history and supporting documentation, the threat of internal corrosion may be deemed inactive if:

- i. It can be demonstrated that a corrosive gas is not being transported, per section 192.475(a);
- ii. In-line inspection data confirms that a corrosive environment does not exist within the pipeline; or
- iii. Application of internal corrosion direct assessment (ICDA) demonstrates that there is no internal corrosion occurring at the most likely locations, and is accompanied by sufficient documentation to demonstrate the assumptions used with the ICDA model (normally dry gas with occasional upsets) are valid for the pipeline's entire operating history.

The threat of internal corrosion should be considered active if:

- i. Production, storage, or non-pipeline-quality gas was transported at any time during the history of the pipeline;
- ii. The pipeline has been converted from another type of service that is susceptible to internal corrosion;
- iii. Unmonitored or inoperative drips, siphons, dead legs, or other liquid holdup points are present anywhere in the pipeline;
- iv. There is evidence that liquids from drips, siphons, dead legs, or other liquid holdup points are present anywhere in the pipeline;
- v. Pipe inspection reports, as required by section 192.475(b), indicate evidence of internal corrosion; or
- vi. The operator does not have a complete pipeline operating history.

### **3. Stress Corrosion Cracking**

The threat of stress corrosion cracking (SCC) should always be considered active. The operator must continually inspect the pipeline for the presence of SCC during pipeline examination, as required by section 192.459.

### **Static or Stable Threats**

#### **4. Manufacturing**

There is substantial guidance provided in the original Gas Transmission IM protocols (e.g. Protocol C.01 Threat Identification), Part 192—Subpart O, ASME B31.8S-2004, and the PHMSA Gas Transmission IM FAQs (e.g., 219, 220, 221, and 231) regarding the deactivation of

manufacturing threats for a segment for any given assessment cycle. Some of this guidance includes FAQ 219 (manufacturing and construction (M&C) defects when Subpart J tested), FAQ 220 (M&C defects when never Subpart J tested), and FAQ 231 (5-year operating history).

Additionally, section 192.917(e)(3) provides guidance for determining when a manufacturing threat is active. Section 192.917(e)(3) states, “[i]f any of the following changes occur in the covered segment, an operator must prioritize the covered segment as a high-risk segment for the baseline assessment or a subsequent reassessment.

- i. Operating pressure increases above the maximum operating pressure experienced during the preceding five years;
- ii. MAOP increases; or
- iii. The stresses leading to cyclic fatigue increase.”

## **5. Construction**

There is substantial guidance provided in the original Gas Transmission IM protocols, Part 192—Subpart O, ASME B31.8S-2004, and the PHMSA Gas Transmission IM FAQs regarding deactivation of construction threats for a segment for any given assessment cycle. Some of this guidance includes FAQ 219 (M&C defects when Subpart J tested), FAQ 220 (M&C defects when never Subpart J tested), and FAQ 231 (5-year operating history).

Section 192.917(e)(3) provides guidance for determining when a construction threat is active, stating, “[i]f any of the following changes occur in the covered segment, an operator must prioritize the covered segment as a high-risk segment for the baseline assessment or a subsequent reassessment:

- i. Operating pressure increases above the maximum operating pressure experienced during the preceding five years;
- ii. MAOP increases; or
- iii. The stresses leading to cyclic fatigue increase.”

## **6. Equipment**

An equipment threat is defined in ASME B31.8S-2004, Appendix A6.1, as pressure control equipment, relief equipment, gaskets, O-rings, seal/pump packing, or any equipment other than pipe and pipe components. The equipment threat may be inactive depending on an operator’s history and review of the records, as required by sections 192.613, 192.617, 192.603, 192.605, 192.739, and 192.743. Operating history, failures, and abnormal operations records should be evaluated by integrity personnel to assist in determining trends and issues that may not be recognized by local or other operations personnel.

As identified in ASME B31.8S-2004, Appendix A6.4, assessments for equipment threats are normally conducted during maintenance activities, per the requirements of the O&M procedures. Monitoring the data from operating history and failures is essential for identifying trends related to this threat. Communication between O&M and integrity personnel is a key component to integrating this threat, as well as the potential increased risk that it poses to pipeline segments, into risk assessments.

Preventative measures and mitigative measures are an important factor in maintaining the inactive status of equipment threats. For example, recognizing a system-wide problem with set point drift in a particular regulator may necessitate a shorter maintenance cycle or the replacement of the in-service regulators impacted by this problem.

## **Time Independent Threats**

### **7. Third-Party Damage**

The third-party threat should never be considered inactive.

### **8. Incorrect Operations**

Incorrect operations are defined in ASME B31.8S-2004, Appendix A8.1, as incorrect operating procedures or failure to follow a procedure. This threat should always be considered active.

### **9. Weather-Related and Outside Forces**

Weather-related and outside forces are defined in ASME B31.8S-2004, Appendix A9.1, as earth movement, heavy rains or floods, cold weather and lightning, or events that may cause pipe to be susceptible to extreme loading. This threat should always be considered active.

## **Cyclic Fatigue**

In addition to the nine threats referenced in ASME B31.8S-2004, § 192.917(e)(2) states, “[a]n operator must evaluate whether cyclic fatigue or other loading condition (including ground movement, suspension bridge condition) could lead to a failure or a deformation, including a dent or gouge, or other defect in the covered segment. An evaluation must assume the presence of threats in the covered segment that could be exacerbated by cyclic fatigue. An operator must use the results from the evaluation together with the criteria used to evaluate the significance of this threat to the covered segment to prioritize the integrity baseline assessment or reassessment.”

Cyclic fatigue is a concern because it is a threat that interacts with all other threats.

Interactive threats are two or more threats acting on a pipeline or pipeline segment that increase



the probability of failure to a level significantly greater than the effects of the individual threats acting alone. In order to manage cyclic fatigue, therefore, operators must have system-specific data applicable to their unique operating environment to justify the inactive status of the cyclic fatigue threat. A system-wide or generic study of cyclic fatigue may be used by an operator as long as the operator documents why the study is applicable to the segment-specific conditions.

## **II. Advisory Bulletin (ADB-2017-01)**

**To:** Owners and Operators of Natural Gas Transmission Pipelines

**Subject:** Deactivation of Threats

**Advisory:** The threats identified in ASME B31.8S-2004 may be considered active or inactive, but are never permanently eliminated. ASME B31.8S-2004, Appendix A, identifies the information an operator must collect and analyze for threats, which must demonstrate an individual threat is not acting on the pipe before an operator can properly declare the threat inactive for each assessment period. A threat must be considered active if any data required by Appendix A is missing, as lack of data indicating the existence of a threat is not acceptable justification for considering the threat inactive. Documents to support the determination of an inactive threat status must be maintained, as per the requirements of § 192.947(d). An operator does not need to assess a threat for the current assessment cycle if that threat is properly deemed inactive. When conditions warrant a review or new information becomes available during the required § 192.937 evaluation operators are required to examine each applicable threat to determine its active or inactive status.

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