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Industry Guidance on Records Review for Re-affirming Transmission Pipeline MAOPs

The intent of this document is to provide general guidance to pipeline operators who are undertaking a process to review their records for the purpose of re-affirming their maximum allowable operating pressures (MAOPs) for existing transmission pipelines. The guidelines are simply a suggestion of practices which can be considered by operators who are developing a plan, in response to recommendations made by the National Transportation Safety Board and the advisory bulletin issued by DOT’s Pipeline Hazardous Materials Safety Administration (PHMSA) on January 10, 2011.

Background
Given concerns recently expressed by NTSB and PHMSA, pipeline operators have a renewed focus on locating and verifying the records used to establish the MAOP for their transmission pipelines. Many operators are conducting record searches and re-evaluating existing records for completeness in order to re-affirm the MAOPs for existing transmission lines.

Operators may discover that some of the original records used to establish pipeline MAOP may now be missing or judged to be incomplete by today’s standards. Due to mergers and acquisitions, some pipelines changed ownership without historical records being shared or retained. The current federal requirements to conduct a post construction pressure test, and to keep records of that pressure test, came into existence in 1970 with the inception of the federal pipeline safety code. Although federal regulations were not in place prior to 1970, most pipeline operators installed pipelines and established a pipeline’s MAOP under the ASA B31.1 standard (1935-51), the ASME B31.8 standard (1952 and after) or individual company standards, which were largely based upon the foundation of the ASA/ASME standards. In addition, a number of states had established pipeline safety regulations prior to federal regulation. When the federal pipeline safety code came into existence, DOT recognized that historical operating pressure documentation might be the only record available for operators to establish MAOP, even if a pipeline had been tested according to the ASA/ASME standards in place at the time of installation.

Creating a plan
For any significant project, creating a plan helps to ensure a structured approach is taken in achieving project goals. Below is a list of the key areas a pipeline operator may wish to consider in developing a comprehensive plan:

- Communicate with local pipeline safety regulator(s) in order to gain their opinions on what pieces of information are important to substantiate: 1) that a valid pressure test or strength test was conducted to establish MAOP; or 2) the MAOP was established using the Design Pressure and Highest Actual Operating pressure methods under Section 192.619(C). Attempt to develop a common understanding with the regulatory agency (or agencies) on what information is necessary to support a pipeline’s MAOP. Operators can use “AGA White Paper on Verification of MAOPs for Existing Steel Transmission Pipelines” as a reference: [http://www.aga.org/our-issues/safety/pipeline-safety/technical-reports/pages/default.aspx](http://www.aga.org/our-issues/safety/pipeline-safety/technical-reports/pages/default.aspx)

- Determine staffing levels needed and the required skills/knowledge of personnel who should be involved. Identify each person’s roles and responsibilities on the team. It is beneficial to
populate the team with individuals who possess experience in pipeline engineering and construction, field operations and those with knowledge in records management or procurement. If people are pulled away from their daily responsibilities, determine how this will impact the operation and whether those positions need to be backfilled. Determine if contractors will be needed.

- Clearly define the scope of the project and establish a timeframe for completing the work. Balance available resources with seasonal constraints.

- Establish an operating budget. Budget considerations should include whether any costs are recoverable in a rate case.

- In conducting a records search of the entire transmission system, it may be prudent to prioritize selected segments and/or consider a stricter criteria for what information must be found in order to be considered complete for certain pipelines. The following are categories of pipelines that might receive special emphasis.

  - Pipelines in High Consequence Areas (HCAs)
  - Pipelines in Class 3 or 4 locations
  - Pre-1970 pipelines
  - Pipelines operating above 30% SMYS
  - Pipelines considered to be critical to system reliability, including specific customer supply requirements
  - Geological considerations (e.g., known landslide or seismic activity areas)

Prioritization is important to focus efforts and conduct the records search in an orderly manner.

- Identify a complete list of places to look for the records and as-built work orders. This might include central archives, warehouses and company facilities formerly and currently used for engineering, construction, operations and maintenance, pipeline integrity, mapping, purchasing, and records storage. Consider contacting employees, retirees and contractors who may have information on missing records or even possess them. Also contact local regulatory agencies to see if they have records that might be useful to your company.

- Determine how the search results will be cataloged to keep track of which records have been found for each pipeline segment. It is important to use a database or GIS to tie physical records to applicable pipeline segments.

- Ensure that local operating personnel involved in managing the daily operation still have access to all the information on the records being reviewed even if the records are moved to a different location.

- Prepare a plan in advance which contains the actions the company will consider taking if necessary records cannot be located, particularly if the information cannot be found by a certain timeframe. Consider involving the applicable state regulator(s) in deciding what actions are prudent and reasonable. It is likely that actions may be dictated by the characteristics and functionality of each pipeline segment.
• Talk with other pipeline operators that have experience in searching for records and consult with them periodically as issues arise.

• Consider including a quality control or quality assurance process.

As a result of this process, transmission pipeline MAOPS should be re-affirmed based upon the information found. Adjustments to MAOPs may be appropriate when substantiating information is not found unless the operator chooses to take alternate actions to mitigate the risk.

Questions and Answers:

1) **How can pipeline operators know that their existing records are accurate?**
   Operators should take advantage of each opportunity to verify the pipeline properties and its location are captured correctly on existing maps and databases. Whenever an operator becomes aware that a transmission pipeline is exposed, even by a 3rd party, the operator should use that opportunity to collect information on the attributes of the pipeline and appurtenances. In some cases removing coupons, performing ultrasonic thickness measurements, or conducting non-destructive testing may be beneficial. Operators can train their employees and tailor their forms and processes to support such an approach. This approach is consistent with § 192.937

   **What is a continual process of evaluation and assessment to maintain a pipeline’s integrity?**

2) **What type of conservative default values are there for operators to use if they have pipelines with missing information?**
   The most conservative applicable default value should be used where an operator is missing information on a pipe that would affect its MAOP. The applicable default value should take into consideration the material properties known to exist for the date of installation and for the year the pipe was manufactured. As an example, a company may have specific knowledge on its legacy practices which give it a sound basis to make educated decisions. In this case, if the company’s demonstrable policy has been that it only used Grade B or higher pipe, then it should be able to use Grade B pipe specifications as the most conservative pipe yield strength for the purposes of calculating the design pressure and MAOP. If a company has no such policy, then 24,000 psi yield strength could be used if the pipe grade is missing and no additional information or pipe specification exists.

   If the longitudinal joint factor for steel pipe cannot be determined, it should not exceed 0.8 (for greater than 4”) or 0.6 (for 4” and lower). If wall thickness is unknown, the lowest available wall thickness for a given diameter should be utilized unless other supporting documentation exists (e.g.- purchasing records or material records). Alternatively, the operator may take appropriate steps to determine pipe attributes including wall thickness, pipe grade and longitudinal seam type. An example would be using data from in-line inspection or UT examination to determine a pipeline’s wall thickness.

3) **Should pipeline components be included in the records search?**
   Any MAOP determination must ultimately take into consideration the pressure rating of individual pipe components such as valves, flanges, tees, and elbows. The search of pipeline records should also include applicable pipe components.
4) **How long might this records process take?**
   It depends on a variety of factors and is largely contingent upon the success of the company in finding the records. The volume of work is predominately based on how many miles of transmission pipe are in the operator's system and how the information was originally recorded and stored.

5) **What type of information should an operator be seeking in its records search?**
   Operators should seek information which can validate the determination of MAOP by any of the allowed methods under 49 CFR § 192.619 - design pressure, pressure test, historic operating pressure or maximum safe pressure. Some examples are:
   - Operating pressure charts, logs, and tables
   - Engineering design and field drawings
   - Pressure test plans/procedures
   - Bill of material
   - Purchase orders
   - Pipe certification reports
   - Material requisitions
   - Uprate procedures
   - Signed statements from employees or contractors
   - Mill test information
   - Pipeline integrity data
   - Inspector records
   - Contractor records

6) **What type of records are necessary where the operator relied upon the highest actual operating pressure in order to establish the MAOP?**
   A PHMSA document “Determination of Maximum Allowable Operating Pressure in Natural Gas Pipelines” was issued in the 1990s to pipeline operators and regulators to clarify what records would be acceptable for documenting the historic operating pressure. Significantly, it has been used by OPS training personnel. In part, it states:

   “For onshore pipelines, review records for the highest operating pressure between July 1, 1965 and July 1, 1970, such as pressure charts, regulator station inspection reports showing inlet or outlet pressures, etc. (If no records are available, a notarized statement by a person in charge of pipeline operations during that time period, attesting to the operating pressure during that period, may be acceptable at the discretion of regulatory agencies).

   The historic operating pressure limit can be overridden in two ways: by a pressure test under 192.619(a)(2) conducted after July 1, 1965, or by an uprating in compliance with Part 192, Subpart K. The most recent test or uprating would control.”

   As noted by the PHMSA document, pressure charts, regulator station inspection reports documenting inlet/outlet pressures, and similar documents are all acceptable ways to validate the highest actual operating pressure in the five-year period prior to July 1, 1970. At this time, it
appears that signed statements from operating personnel may not be considered sufficient by some regulators in supporting grandfathered MAOPs under Section 192.619.

Technical references:
2. “Periodic Hydrostatic Testing or In-Line Inspection to Prevent Failures from Pressure Cycle Induced Fatigue” by John F. Kiefner and Willard Maxey
4. “ASME B31.8S – 2010, Managing System Integrity of Gas Pipelines”, American Society of Mechanical Engineers
5. ASME CRTD-91 “Applications Guide for Determining the Yield Strength of In-Service Pipe by Hardness Evaluation”
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