



MAOP Determination

Rob Horensky & Terri Cooper Smith
Civil Engineer-Inspectors

Why?

- Several incidents across the country over the last 5-10 years have revealed operating pressures exceeding the mechanical limits of the pipeline structures
- After the San Bruno incident, PHMSA issued ADB-11-01 which, in part, stated “... to perform detailed threat and risk analyses that integrate accurate data and information from their entire pipeline system, especially when calculating Maximum Allowable Operating Pressure (MAOP) or Maximum Operating Pressure (MOP)...”

San Bruno



San Bruno

-On September 9, 2010, about 6:11 p.m. Pacific daylight time, a 30-inch-diameter segment of an intrastate natural gas transmission pipeline known as Line 132, owned and operated by the Pacific Gas and Electric Company (PG&E), ruptured in a residential area in San Bruno, California.

San Bruno

- The rupture produced a crater about 72 feet long by 26 feet wide. The section of pipe that ruptured, which was about 28 feet long and weighed about 3,000 pounds, was found 100 feet south of the crater. PG&E estimated that 47.6 million standard cubic feet of natural gas was released.
- The released natural gas ignited, resulting in a fire that destroyed 38 homes and damaged 70.
- Eight people were killed, many were injured, and many more were evacuated from the area.



Timeframe

- San Bruno Incident -Sept 9, 2010
- Jan 3, 2011 NTSB recommendations to PHMSA
- January 4, 2011: ADB-11-01
- August 2, 2011: DIMP Implementation
- May 7, 2012: ADB 12-06
- December 21, 2012: ADB 12-11
- PA PUC enhanced MAOP verification process
- PHMSA gave a presentation on MAOP Determination at the 2013 EAP conference in Hershey, PA.
- Speaking topic at the last several Gas Safety Conferences.



MAOP Determination

- 192.619, 192.621, 192.623 are the regulations that determine MAOP. 192.620 is used for determining an Alternative MAOP
- All calculations are only as reliable as the records and information provided to the engineer(s).



When does Gas Safety look at MAOP

- All the time....
- District operator inspections
- Field construction inspections
- District regulator inspections
- Transmission line inspection
- Corrosion inspection
- DIMP/IMP
- Anytime in the field: looking at class locations, verifying pipe size, wall thickness, pipe type, pressure tests,
- Anytime at records review: looking for install dates, pipeline conditions reports, material etc.



MAOP – what inspectors are seeing

- Several reviews have been conducted across the State with various distribution and transmission operators
- What is “Documentation”? What’s not?
- The misconception of the “5 Year Rule”
- The Grandfather Clause



MAOP – Findings

- Valve ratings- what is that valve rated for...for natural gas
- Regulator station settings and relief calculations
- Weakest link...do you know what is in the ground
- What part of .619, .621 and .623 was used to establish MAOP for each segment?
- Keep your records...MAOP needs to be verifiable...generic documents are not enough.

EXCERPTS FROM OPS INSPECTION FORM

TRANSMISSION

| .605(a) | MAOP PROCEDURES | S | U | N/A | C | | | | | | | | | | | | | | | |
|---|---|---|---------------|-----------|---|--|---|---|--|--|---------------------------|---------------|---------------|----------------------|---------------|---------------|--|--|--|--|
| .619 | Establishing MAOP so that it is commensurate with the class location | | | | | | | | | | | | | | | | | | | |
| | MAOP cannot exceed the lowest of the following: | | | | | | | | | | | | | | | | | | | |
| | (a)(1) Design pressure of the weakest element | | | | | | | | | | | | | | | | | | | |
| | (a)(2) Test pressure divided by applicable factor | | | | | | | | | | | | | | | | | | | |
| | (a)(3) The highest actual operating pressure to which the segment of line was subjected during the 5 years preceding the applicable date in second column, unless the segment was tested according to .619(a)(2) after the applicable date in the third column or the segment was uprated according to subpart K, Amdt 192-102 pub. 3/15/06, eff. 04/14/06. For gathering line related compliance deadlines and additional gathering line requirements, refer to Part 192 including this amendment. | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th align="center">Pipeline segment</th> <th align="center">Pressure date</th> <th align="center">Test date</th> </tr> </thead> <tbody> <tr> <td>-Onshore gathering line that first became subject to this part (other than § 192.612) after April 13, 2006.</td> <td>March 15, 2006, or date line becomes subject to this part, whichever is later.</td> <td>5 years preceding applicable date in second column.</td> </tr> <tr> <td>- Onshore transmission line that was a gathering line not subject to this part before March 15, 2006.</td> <td></td> <td></td> </tr> <tr> <td>Offshore gathering lines.</td> <td>July 1, 1976.</td> <td>July 1, 1971.</td> </tr> <tr> <td>All other pipelines.</td> <td>July 1, 1970.</td> <td>July 1, 1965.</td> </tr> </tbody> </table> | Pipeline segment | Pressure date | Test date | -Onshore gathering line that first became subject to this part (other than § 192.612) after April 13, 2006. | March 15, 2006, or date line becomes subject to this part, whichever is later. | 5 years preceding applicable date in second column. | - Onshore transmission line that was a gathering line not subject to this part before March 15, 2006. | | | Offshore gathering lines. | July 1, 1976. | July 1, 1971. | All other pipelines. | July 1, 1970. | July 1, 1965. | | | | |
| Pipeline segment | Pressure date | Test date | | | | | | | | | | | | | | | | | | |
| -Onshore gathering line that first became subject to this part (other than § 192.612) after April 13, 2006. | March 15, 2006, or date line becomes subject to this part, whichever is later. | 5 years preceding applicable date in second column. | | | | | | | | | | | | | | | | | | |
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| Offshore gathering lines. | July 1, 1976. | July 1, 1971. | | | | | | | | | | | | | | | | | | |
| All other pipelines. | July 1, 1970. | July 1, 1965. | | | | | | | | | | | | | | | | | | |
| | (a)(4) Maximum safe pressure determined by operator. | | | | | | | | | | | | | | | | | | | |
| | (b) Overpressure protective devices must be installed if .619(a)(4) is applicable | | | | | | | | | | | | | | | | | | | |
| | (c) The requirements on pressure restrictions in this section do not apply in the following instance. An operator may operate a segment of pipeline found to be in satisfactory condition, considering its operating and maintenance history, at the highest actual operating pressure to which the segment was subjected during the 5 years preceding the applicable date in the second column of the table in paragraph (a)(3) of this section. An operator must still comply with § 192.611, Amdt 192-102 pub. 3/15/06, eff. 04/14/06. For gathering line related compliance deadlines and additional gathering line requirements, refer to Part 192 including this amendment. | | | | | | | | | | | | | | | | | | | |

DISTRIBUTION

| .605(a) | MAOP PROCEDURES | S | U | N/A | C |
|---------|---|---|---|-----|---|
| .619 | Establishing MAOP so that it is commensurate with the class location | | | | |
| | MAOP can be determined by: | | | | |
| | (a) Design and test or | | | | |
| | (b) By highest operating pressure to which the segment of line was subjected between July 1, 1965 and July 1, 1970. | | | | |
| .621 | MAOP - High Pressure Distribution Systems | | | | |
| .623 | Max./Min. Allowable Operating Pressure - Low Pressure Distribution Systems | | | | |