NORTH DAKOTA
OIL AND GAS DIVISION

Oil and Gas Division

Lynn D. Helms - Director Bruce E. Hicks - Assistant Director
Department of Mineral Resources
Lynn D. Helms - Director
North Dakota Industrial Commission
www.dmr.nd.gov/oilgas/

ADMINISTRATIVE RULES COMMITTEE HEARING

TESTIMONY OF KEVIN C. CONNORS
September 13, 2016

Chairman Devlin and Committee Members:

Issue: Clamping or squeezing produced water gathering pipelines is prohibited

NDAC Sec. 43-02-03-29.1 (14)c (Clamping or squeezing produced water gathering pipelines is prohibited)—Justification of changes

Originally Proposed language: NDAC Section 43-02-03-29.1 (14)c

Clamping or squeezing as a method of repair for any produced water underground gathering pipeline is prohibited.

Five parties submitted comments, four of which were from industry and one was a representative of the Labors International Union of North America (see Consideration of Comments page 22). After fully considering the comments, the Commission modified the original language (note yellow-highlighted text):

NDAC Section 43-02-03-29.1 (14)c

Clamping or squeezing as a method of repair for any produced water underground gathering pipeline is prohibited, except in an emergency. Any damaged portion of a produced water underground gathering pipeline that has been clamped or squeezed must be replaced before it is returned to service.

Industry Comments:

- Emergency - Commenters requested the Commission allow clamping or squeezing in temporary emergency situations.
- Damage – One commenter stated crimping pipe does permanent damage to the pipe.

Energy and Environmental Research Center Study:

- One common method of damage to high-density polyethylene (HDPE) pipeline occurs when a leak in a pressurized line is repaired.
- By leaving the line pressurized, the time for repairs is much reduced.
- Repairs are made by first compressing the HDPE line on each side of the leak to stop fluid flow using specialized clamping rigs.
- It has been reported to the EERC that no matter how carefully done, **damage to the HDPE almost always occurs during the clamping and unclamping processes**.

- This damage can be the source of future leaks.

Energy and Environmental Research Center Recommendation:

- Repairs to all thermoplastic pipelines should be done by first depressurizing and then draining the line near the breach before making an unclamped repair of the line.

Regulatory Flexibility:

NDAC Section 43-02-03-29.1 allows the manufacturer's specification to take precedence over the requirements found in this section.

<u>If these rules differ from the pipeline manufacturer's prescribed installation and operation practices, the pipeline manufacturer's prescribed installation and operation practices take precedence.</u>

NDAC 43-02-03-02 allows for exceptions to the requirements found in Chapter 43-02-03 after notice and hearing.

The commission may grant exceptions to this chapter, after due notice and hearing, when such exceptions will result in the prevention of waste and operate in a manner to protect correlative rights.

Lessons learned:

Two major oil and gas operators in North Dakota have determined, separately, that clamping and squeezing of produced water underground gathering pipelines cannot be done without damaging the integrity of the pipe.

- Both operators, on their own accord, dug up and replaced all sections of pipe that had previously been squeezed.

- One major spill resulted from the practice of clamping or squeezing. The spill was more than 1500 bbls of produced water that ended up entering a lake and the cleanup effort is currently at $6 million and counting.

Technical Explanation:

- Underground gathering pipelines operate at varying flow rates, pressures, and temperatures.

- Saltwater is a high temperature fluid as it travels through these pipelines.

- Gathering systems are subject to the fluid production at the well sites, which leads to instances of fluid volumes reaching capacity, in terms of flow rate and pressures, one moment and slack or zero-flow conditions the next.

- Clamping or squeezing of the pipe for repairs and or tie-ins compromises the pipe by causing weaknesses in the pipe walls where the pipe was squeezed off.

- The varying operating conditions expose these minor weaknesses in the pipe wall to the variability in pressures and temperatures and have the potential to cause these weaknesses to expand over time and become the source of a leak or spill.

Figure 1: The subject pipe, as received, showing the top surface.

Figure 2: The primary fracture, located on the 3 o'clock ear.

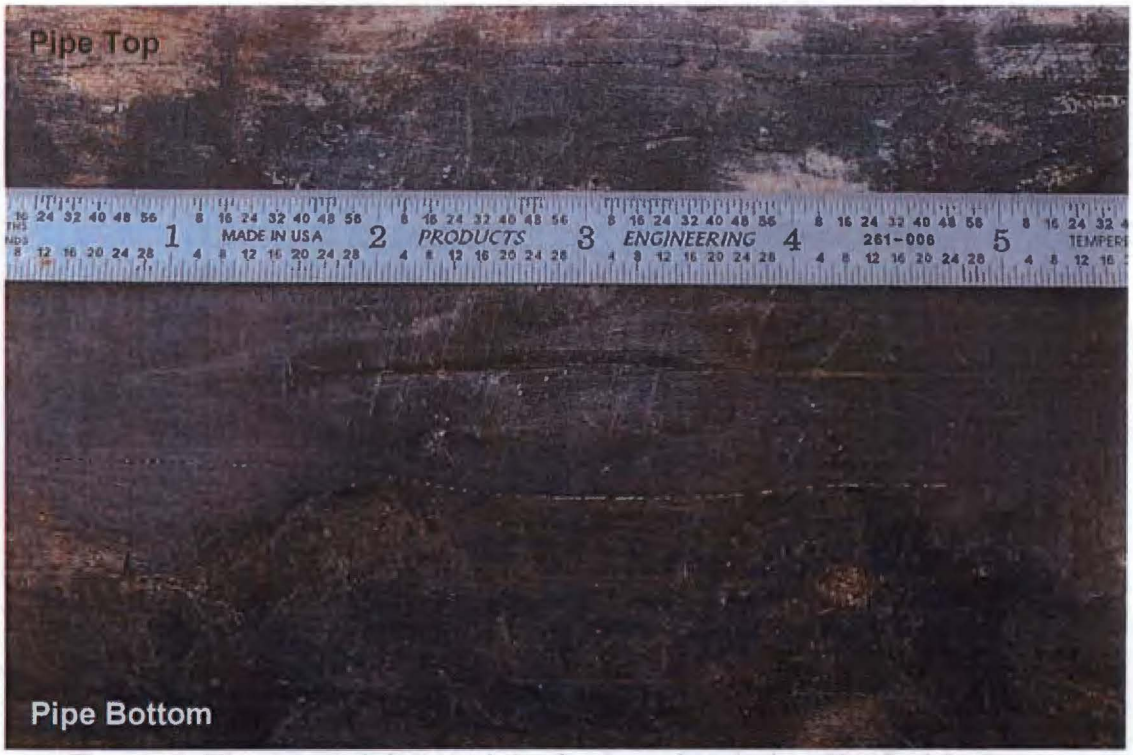

Figure 3: The second, incomplete, fracture, located on the 9 o'clock ear.

Figure 4: Interior surface of the throughwall fracture.

Figure 5: Parallel cracking is evident within the wrinkles of the throughwall fracture.

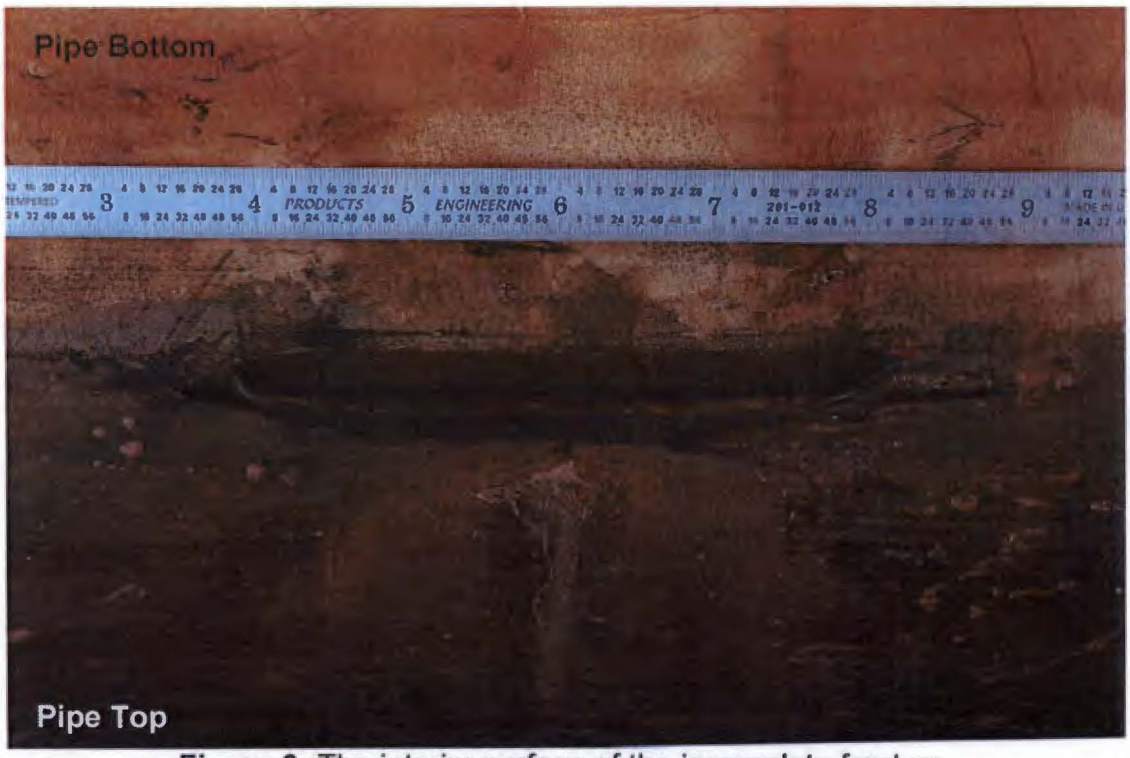

Figure 6: The interior surface of the incomplete fracture.

Figure 7: Parallel cracking is evident within the wrinkles of the incomplete fracture.

Figure 8: The fracture surface of the throughwall fracture.

Figure 9: The throughwall fracture surface, when viewed from the side, showing the flap of pipe material.

Figure 10: The incomplete fracture surface, after manually completing. The smooth surface at the exterior was created when the crack was forced open.