USE CASE

Protecting pipeline integrity from the inside – managing corrosion issues without compromising inspection

This case focuses on how a large midstream company ran an integrity program that used inspection pigs to find corrosion inside its large transmission lines. Traditional L and U-shaped drips only capture liquids flowing along the bottom, not annular flows. The Innopipe solved this problem, and more than 30 Innopipe systems were installed across the pipeline network. Each Innopipe removed the liquids that cause corrosion while keeping the line open to inspection pigs.

Quick Facts

Industry	Gas processing
Location	Field-tested in southern Alberta, installed in southwestern Ontario
Challenge	Corrosive liquids wetted the whole pipe wall. Old-style drips caught only bottom liquid and blocked inspection pigs, so they had to be removed.

Solution	Innopipe piggable pipeline drips, sized for 26" to 48" transmission lines operating at about 1,000 psi, were installed.
Timeline	Innopipe installations of 30 systems over the course of 14 years.
Results	The Innopipe systems resulted in about 10 times more free liquid removed. The piggable design met inspection requirements and allowed for bi-directional pigging.

Challenge

The midstream company moved mostly Alberta-produced gas through 26", 34", 42" and 48" lines at about 1,000 psi to its storage caverns in Ontario. Today, the system still handles more than 1.2 trillion cubic feet of gas a year.

Liquid in a gas line causes internal corrosion. The company managed this with a strict integrity program. Inspection pigs measured the depth and size of corrosion pits inside and outside the pipe.

The lines had traditional U-shaped drips to catch liquids but, these blocked pigging.

Excavations showed a second problem. At gas speeds of 30 to 50 feet per second, liquid wetted the entire inside wall of the pipe. Traditional drips only caught liquid along the bottom. Most of it passed straight over the top.

The Solution

The Innopipe system is an inline separator that pigs can pass through. The design targets how liquid actually moves in a fast-flowing gas line. It travels as a film around the whole pipe wall. Innopipe's slotted liner forms a smooth path that pigs can travel through. The slot openings give the liquid film a path out of the pipe into a collection vessel. The gas continues with negligible pressure loss.

The midstream company now removes corrosive liquids and runs inspection pigs on the same line, with no compromise between the two.

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Results

The Innopipe solution delivered measurable benefits, including:

- **Ability to accomplish two key challenges**: Corrosive liquids are removed and inspection pigs can run in the same line without compromise to integrity monitoring
- **About 10 times better liquid removal:** gas-plant tests showed the new design increased free-liquid separation efficiency by close to a factor of 10 compared with older drips
- **Inspection kept intact:** the piggable design meant inspection pigs could monitor corrosion while retaining liquid removal capability
- **Less liquid in contact with the pipe wall:** capturing the full annular film, not just bottom liquid, takes away the water that drives corrosion
- **Proven at scale:** more than 30 systems were installed on 26" to 48" lines
- **Decades of reliable service:** Innopipe reports its piggable drips have run reliably for decades beyond their original design life
- **Lower long-term integrity cost:** across Innopipe installations, removing liquids is reported to reduce corrosion, cut inhibitor chemical use, reduce black powder and extend pipeline life

Key Outcome

Innopipe ended the trade-off between removing corrosive liquids and integrity monitoring on the same line. The Innopipe design has protected transmission pipeline integrity for decades.