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Building a Better Liquid Trap

INNOVATIVE SOLUTIONS FOR LIQUIDS REMOVAL IN NATURAL GAS PIPELINES

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Innopipe's large diameter pipeline unit.

Natural gas pipelines often contain liquids that can interfere with the proper operation of pipeline-related equipment such as compressors, regulators, meters, and processing equipment. These liquid contaminants normally include hydrocarbon condensate, lubricating oils, glycols, water, and other chemicals used in the treatment, dehydration or compression of natural gas.

Removal of these unwanted liquids is usually the goal, often by large equipment like gas liquid separators, filters and coalescers. For gas transmission lines, pipeline drips are regularly employed. Many of these solutions are very costly and, in the case of older style pipeline drips, do not work very well at collecting liquids all around the pipe.

Gas/liquid separators work by slowing the velocity of the gas as it passes through the vessel. This velocity reduction allows any larger liquid droplets to fall out through gravity. Many of the smaller droplets that are created by this sudden, violent slow-down are coalesced by a mesh pad in the separator. Some of the very small droplets get by the mesh allowing some liquid to carry on further down the pipe and eventually form into larger droplets, only to repeat the process.

Separator vessels are much larger than the pipeline diameter and require the vessel wall thickness to be quite substantial. This translates into a large expense and more welding to produce such vessels. The same goes for coalescers and other types of fil-

ters. These vessels must also be strategically placed in a pipeline to allow for pigging of the pipe.

To combat many of the costs and operational problems associated with traditional liquid removal systems, the patented Innopipe Piggable Pipeline Separator was developed. The Innopipe Separator utilizes an "annular" separation technique to remove liquids.

Annular flow relates to the flow of high-pressure natural gas liquids in pipelines. Annular flow means liquids tend to reside in the slower moving gas found on the outside of the pipe. The Innopipe separator directs only the gas containing most, if not all, of the liquids moving along the wall into a separate reservoir. The centre of the gas stream passes through the unit untouched. The advantage of annular separation is that only 5% to 10% of the primary gas flow is disturbed, yet it removes all of the free liquid in a gas stream.

Minimizing the amount of gas removed allows a smaller, more efficient collection

vessel to be utilized. The result is a cost-effective liquid separator that is as efficient as large separators at a lower cost and, as a bonus, is piggable. Innopipe Separators can be placed under- or above ground depending upon the system requirements.

With over 25 units installed - from 2" to 48" - operational experience and independent testing have proven the Innopipe Separator can be used in a variety of applications. These include transmission line liquid removal, compressor protection, storage cavern liquid removal, glycol carryover removal after dehydration units, production separators, and any other place where liquids in gas streams are a problem.

Liquids in gas pipelines are a fact of life. Getting them out no longer needs to be expensive or cumbersome with Innopipe.

The author acknowledges the assistance of Miles E. Haukeness, inventor of the Innopipe and Director of Innovative Pipeline Technology Inc. in Estevan, Saskatchewan. References are available from the author.

