Pipeline Risk Assessment – New Developments for Natural Gas and Hydrocarbon Pipelines

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ABSTRACT

Risk assessment of natural gas transmission pipelines has been increasingly used to assist pipeline operators with the management of pipelines, and to extend the use of these assets, such as operating beyond the original design specifications and lifetime. BG Technology, in collaboration with an international group of gas companies, have developed, a knowledge based hazard and risk assessment package for gas transmission pipelines. PIPESAFE has already been widely used by the companies that supported its development, and allows managers to take informed decisions on what can be complex and emotive problems associated with pipeline operation and routing. This paper describes the methodology and mathematical modeling employed in PIPESAFE, particularly recent developments to allow a probabilistic treatment to be given to the prediction of the consequences of pipeline failure.

A study has been undertaken to identify the elements required to extend the approach adopted in PIPESAFE for high pressure gas pipelines, to pipelines transporting other hazardous materials such as gasoline, ethylene, natural gas liquids, crude oil and oil products. This paper describes a methodology for assessing the risks from pipelines transporting these materials that has many similarities with that in PIPESAFE. It describes the current state of development of additional models for these materials that can be used to produce a risk assessment package suitable for assessing a variety of hydrocarbon transmission pipelines.