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Design and Construction of Pipeline Integrated Oil Storage Caverns

Jack Broyles, Paul Dusseault, Frank Vanden Elsen

ABSTRACT

In response to industry demand, Hardisty Caverns Limited Partnership (HCLP) has developed cost effective underground storage facilities with a capacity to store 480,000 m^3 (3 million barrels) of crude oil. This project is unique through the integration of existing underground salt caverns into a significant North American crude oil transportation hub. Annually, 64 million cubic meters (400 million barrels) of oil move through this hub.

This project utilizes existing caverns developed in the late 1960's. Significant work was required to upgrade the cavern facilities and to construct new surface facilities to integrate the caverns into the crude oil transportation hub. Remote operation of the facility is performed from a control centre in Edmonton.

In this paper, the key features of the design and construction of the Hardisty Cavern Storage Project will be presented. Of particular interest are the unique challenges presented due to hydraulic considerations related to cavern operation with multiple product characteristics and to provide crude oil movements exchanges between the cavern storage facilities and both low flow rate feeder pipelines and high flow rate transportation pipelines.

Figure 1: Aerial view of Cavern site and Hardisty Oil Hub

Key Words: Cavern Design, Cavern Operation, Caverns for Liquid Storage