Solution Mining Research Institute, Spring 2002 Technical Meeting
Banff, Alberta, Canada, April 28-30

Storage of Hydrocarbons in Underground Formations Canadian Standards Association Code Z341

Jug Manocha, P.Eng., Caverns & Storage Engineer
Petroleum Resources Centre
Ontario Ministry of Natural Resources, London, Ontario, Canada

Onorio Cicchini, P.Eng., Wells Associate
Dow Chemical Canada Inc.
Fort Saskatchewan, Alberta, Canada

ABSTRACT

CSA Standard Z341, Storage of Hydrocarbons in Underground Formations establishes minimum requirements for the storage of hydrocarbons in naturally formed geological reservoirs and in solution-mined salt caverns. This Standard contains basic reference data and formulas relating to design, supplemented by specific requirements, where necessary, to obtain a uniform interpretation of the design requirement.

This Standard establishes the minimum requirements for design, construction, operation, maintenance, abandonment, and safety of hydrocarbon storage in underground formations and associated equipment. The equipment considered includes wellhead and christmas tree assemblies and subsurface wells and process equipment, safety equipment, including monitoring, control, mechanical integrity testing, and emergency shutdown systems, related to the storage facilities, wells, and wellheads. Hydrocarbons within the scope of this Standard include crude oil, diesel, natural gas, methane, ethane, propane, butane, and other hydrocarbons by themselves or in mixtures.

The major changes to the Standard in the third edition are a shift to performance based standards writing style. For the first time, a commentary is included for various sections in the Standard to provide rationale and technical elaboration. The standard also includes appendices where specific terms and parameters are defined that allow for standard calculations to determine the maximum hydrocarbon storage pressure at the casing seat.

This Standard was developed by consensus by Technical Committee on Storage of Hydrocarbons in Underground Formations, under the jurisdiction of the Standards Steering Committee on Oil and Gas Industry Systems and Materials. This standard has been adopted into regulatory requirements in some Canadian provinces. The Interstate Oil and Gas Compact Commission for the United States has adapted the definitions and requirements sections.

By having the industry, regulators and consultants involved in developing and using the standard, it provides an opportunity to develop a minimum standard that provides to enhance public safety and environmental protection. While this standard is now in its 3rd edition, it should be viewed as an evolving standard that incorporates reasonable approach to public safety and

environmental protection. It is to be expected that changes may have to be made from time to time, based on new operational experience or technology, or both.