Best Practices for Vapor Recovery Systems to Reduce Venting and Flaring

Jeffrey L. Voorhis[1] and Inayat Virani[1]

Abstract

Existing and evolving regulatory requirements require oil and gas producers to reduce venting and flaring of natural gas from their operations. Regulatory agencies tightening venting and flaring emissions include Environment Canada, the U.S. Environmental Protection Agency's (USEPA), U.S. Department of the Interior, state/province environmental and oil and gas mining regulatory agencies. These rules seek to minimize the loss of natural resources and to reduce air pollution emissions. The air pollutants of concern include volatile organic compounds (VOCs) and the greenhouse gases methane and carbon dioxide. The source of the natural gas is primarily flash gas liberated from the storage of crude oil and condensate. The presentation discusses the drivers for reducing venting and flaring and gives a step by step approach to vapor recovery from project identification to ultimate success in sending gas to a gathering or sales pipeline. The characteristics of storage tank vent gas are discussed. Steps include identifying project scope and emission standards, design data needs, best design practices, installation, commissioning and monitoring systems. The use of smart systems to measure and monitor system operation and the amount of gas recovered is included. Also covered is the design and use of vapor recovery towers (VRTs) to reduce the chance of oxygen entering the vapor recovery system. Supplemental emission controls using vapor combustion units as backups to the vapor recovery system is also addressed. The presentation will also introduce a new technology used to automate the detection and reporting of leaks from open thief hatches used on storage tanks.

[1]HY-BON Engineering

Jeffrey L. Voorhis joined HY-BON Engineering in 2012 supporting technical and marketing efforts. His knowledge and experience in engineering, environmental issues and facility optimization helps companies implement solutions to increase profits and reduce liabilities. His 30+ year career includes 10 years of private sector oil and gas experience and work for the Texas Railroad Commission and the Texas Natural Resource Conservation Commission (TNRCC). At TNRCC he provided engineering/technical assistance on pollution prevention. His experience includes design, installation, start-up and troubleshooting of environmental control systems as well as commercialization of new processes and technology. Mr. Voorhis earned a Bachelor of Science in Petroleum and Natural Gas Engineering from Kingsville Texas A&M University in 1983. Mr. Voorhis is a registered professional engineer in the State of Texas.