

# **AIR DRILLING IN THE PRESENCE OF HYDROCARBONS: A TIME FOR PAUSE**

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**IADC/SPE Managed Pressure Drilling and Underbalanced Operations Conference  
March, 2005, Galveston, Texas  
IADC/SPE Paper Number 108357**

## **ABSTRACT**

Drilling with compressed air continues to enjoy vast popularity. However air drilling is not without its impediments; not the least of which is its reactivity with hydrocarbons. The application of drilling with compressed air provides many benefits, but misapplication of this technology has led to losses that include equipment both on the surface and downhole. More seriously, the most devastating of these losses are injuries to rig personnel and sometimes fatalities. For too long, some operators, drilling contractors, rig and service personnel have been under the mistaken impression that air drilling is a safe operation over a broad range of applications.

Air is mixture of many gases. Within that mixture there is 21% of oxygen by volume. The minimum oxygen concentration needed for combustion of methane is only 12% at sea level. Many of the Alkane family of hydrocarbons that make up condensate only require 11% - 12% oxygen at sea level for combustion, as well.

Today, air drilling in the presence of hydrocarbons continues to be a common practice. The relationship between hydrocarbon molecular structure, compressed air in the wellbore combined with contributing bottomhole pressure and spontaneous ignition temperatures of the hydrocarbons contribute to the elevated risk profile of drilling with air in the presence of hydrocarbons.

This paper will address the potential hazards associated with air drilling operations, possible solutions to these hazards and recommend practices to avoid or mitigate these hazards.

Malloy KP, GH Medley, and CR Stone: "Air Drilling in the Presence of Hydrocarbons: A Time for Pause", IADC/SPE 108357, IADC/SPE Managed Pressure Drilling and Underbalanced Operations Conference, Galveston, Texas, March 2007.