



A Practical Solution to Control Gas Migration  
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Abstract

Drilling through gas formations poses unique risks such as annular gas flow after cementing. Annular flow related to cementing surface casing has been identified as one of the most frequent causes of loss-of-well control incidents in the Gulf of Mexico (GOM).<sup>1</sup> Poor cement bond has been credited with the most significant cause of annular casing pressure in outer casing strings. Statistics from the GOM indicate that thousands of wells have casing pressure and potential to lose hydrocarbon reserves, pollute the potable water column, or leak at the sea floor.<sup>2,3</sup>

When zonal isolation of gas wells is not achieved, gas can migrate behind the casing, thus charging shallow formations. These shallow gas formations become a costly problem when they are drilled into unexpectedly. They can also become a formidable challenge when the fracture gradient and pore pressure become nearly equal. In these situations, gas can breach the casing and cause a blowout. Clearly, well plug-and-abandonment is complicated when casing annulus squeeze cementing becomes necessary to eliminate gas migration.

Several techniques to control gas migration have been individually utilized with varying degrees of success. These methods involve drilling processes, cementing systems, and mechanical barriers. Three wells in Eugene Island Block 273 have been drilled and completed by using these methods jointly. No gas migration has been detected.

In combination, these practices have the potential to improve the oil and gas industry by making it safer and environmentally friendlier and could ultimately reduce exploitation costs.

Contact TAM for the complete paper.