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DETECTION OF GEOLOGIC STRUCTURES IMPACTING SOLUTION-MINED CAVERN SHAPES IN DOMAL SALT – AN UPDATE WITH CASE HISTORIES

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Abstract

In 2008, at the Austin Fall SMRI Meeting, the technology and method for mapping geologic structures in domal salt to aid in selecting casing shoe and leaching string depths was presented. This involved the use of shear body waves generated by a dipole acoustic source which radiated away from the borehole. The presence of structures within the salt can result in reflections of these body waves back to the borehole, enabling them to be imaged up to 60 feet away from the borehole. This permits an evaluation of a much larger volume of salt around the borehole, promoting an understanding of the geologic structure and its potential impact on the cavern development.

Since 2008, the technology has been refined and the various borehole sizes in which the logging can be successfully executed have been validated. The logging technology has now been applied in multiple, large-diameter solution-mined storage cavern wells in the United States Gulf Coast. Several case histories will be presented and sonar surveys are illustrated to show the correlation between the imaged structures and the solution-mining cavern development.

Key words: Single Well Imaging, Cavern Design, Drilling, Geology, Salt Domes, Storage Cavern, Well Logging