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Meeting Paper

Practical Use of Alternative Cushion Gas in Salt Cavity Storage, Part I – Advantages and Design Features

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PRACTICAL USE OF ALTERNATIVE CUSHION GAS IN SALT CAVITY STORAGE

Part I
Advantages and Design Features

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ABSTRACT

Use of alternative cushion gas in salt cavity storage reservoirs has been of interest since the early 1990's. Because a significant portion of storage gas in conventional storage must remain continuously in the cavity as "cushion gas" to provide the pressure necessary for withdrawal of "top gas" on demand, it had been suggested that one may indeed use a cheaper gas to provide the function of the cushion gas. The idea was made possible through the use of a plastic membrane whereby the top gas would be contained in a centrally located bladder which had to be inserted and deployed in the salt cavity.*[1,2,3] Because the concept implies substantial economic advantage in both development and operation of salt cavities, several questions were raised as directed to specific design and practical implementation. What gases would constitute a reasonable substitute as cushion? What materials could be used for the bladder? How would they perform under the conditions prevailing in salt cavities? How can one insert and deploy such a bladder? What would be a reasonable start-up sequence? What are the fail-safe considerations? This paper reports on research, development, and design work directed to address most if not all of the above questions. The expected performance of salt cavities in gas storage service with alternative cushion is presented and discussed along with an example problem in a companion paper.

*The numbers in upper script refer to References given at the end

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