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Research Project
Report
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**Salt-Cavern Abandonment
Field Test in Carresse**

prepared by

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EXECUTIVE SUMMARY

A one-year long abandonment test was performed on the SPR2 cavern of the Carresse site in France from April 2005 to April 2006. This cavern is 300 m deep and has a volume of 9000 m³. A shut-in pressure test was performed at this cavern from June 2004 to April 2005, making the full duration of the test close to two years.

Cavern temperature was measured in 2002, thermal equilibrium was not reached. However, the rate of temperature increase was slow.

A special system was installed to measure leaks from the central string and from the annular space. It can be proven that leaks were exceedingly small during the July 2005-April 2006 period.

Four pressure steps were allowed. Cavern pressure during the test remained significantly smaller than geostatic pressure. Pressure evolution is more complicated than in caverns in which thermal equilibrium had been reached before the test.

Creep parameters and permeability of the salt formation were back-calculated from the pressure-versus-time curve. It has been proven that this salt formation is creep-prone, and, while the permeability is relatively high, its value is consistent with what has been observed in other bedded salt formations (Etrez).

All the objectives of the RFP have been met. Two groups, Brouard Consulting-Ecole Polytechnique and IUB-DZS, independently perform calculations. Data had been provided by Brouard Consulting, main conclusions are similar.

It can be proven that, when corrected for the effects of brine thermal expansion, cavern pressure consistently drops. It can be inferred that equilibrium pressure is smaller than the pressures experienced by the cavern during the test. It was concluded that this cavern could be sealed and abandoned.