

Solution Mining Research Institute, Fall 2006 Technical Meeting
Rapid City, USA, October 1-4, 2006

SOME ASPECTS OF THE TRANSIENT BEHAVIOUR OF SALT CAVERNS

Mehdi Karimi-Jafari¹, Pierre Bérest¹, Benoît Brouard²

¹ LMS, Ecole Polytechnique, Palaiseau, France

² Brouard Consulting, Paris, France

1 INTRODUCTION

The transient mechanical behavior of *salt samples* has been discussed by several authors (e.g., Lux and Heuserman, 1983; Munson and Dawson, 1984; Aubertin, 1996; Cristescu and Hunsche, 1998). When submitted to a rapid applied load increase, samples experience a several week- (or month-) long period during which the strain rate gradually decreases to ultimately reach the steady-state rate. Conversely, when submitted to a rapid load decrease (stress drop), samples sometimes experience “reverse creep”, or increase in sample height, over a couple of weeks or more.

Less attention has been paid to the transient behavior of *salt caverns* — i.e., the change in cavern volume or (closed) cavern pressure following a rapid change in the cavern fluid pressure. *In situ* “transient” tests are difficult to perform, as measuring small changes in cavern volume is not an easy task (Bérest et al., 2006), and a small number of such tests have been described in the literature (Clerc-Renaud and Dubois, 1980; Hugout, 1988; Denzau and Rudolph, 1997). In this paper, discussion centers on the transient effects of a cavern pressure increase, as they are important in such contexts as mechanical integrity testing, hydro-fracturing and cavern abandonment.

©2022 – Solution Mining Institute
Full Paper is Available in the SMRI
Library(www.solutionmining.org)