

# **FINITE ELEMENT SIMULATION OF BENCH-SCALE AND FIELD TESTS IN AVERY ISLAND DOME SALT**

J. L. Ratigan  
K. L. DeVries  
D. A. Blankenship

## **ABSTRACT**

Parameters for viscoplastic constitutive models attributed to (i) Munson and Dawson and (ii) Krieg were obtained from least-squares fits to laboratory creep and constant strain-rate tests performed on 100-mm-diameter specimens of Avery Island salt. The resulting constitutive models were used in finite-element simulations of laboratory, bench-scale, and field tests on the same salt. The simulated laboratory tests were constant stress-rate tests. In these tests, the stress state is homogeneous in space, but varies through time. The simulated bench-scale tests are hydraulic fracturing tests performed with blocks of salt in controlled triaxial stress states. In the hydraulic fracturing tests, the state of stress in the salt specimen varies both in time and space. The simulated field tests are corejack tests performed in the Avery Island dome in Southern Louisiana. A corejack test consists of a 1-m-diameter, thick-walled hollow cylinder loaded with a constant pressure on the outside radius of the cylinder. In these tests, the stress state varies with space and is nearly constant through time. All of the simulations resulted in reasonable agreement with the measurements in the actual tests.