

SALT GEOMECHANICS SEEN THROUGH 20 YEARS

EXPERIENCE AT THE MANOSQUE FACILITY

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The Manosque site was selected for solution-mined caverns for storing liquid hydrocarbons in 1967. At that time, the theory of rocksalt behaviour was not well established; it was considered as elastic and important gaps were demonstrated between forecasts based on laboratory tests, calculation and in situ tests.

Between 1971 and 1980, rocksalt time-dependent behaviour was demonstrated although new tests and the first FEM calculations confirmed the validity of the first design for storing liquid hydrocarbons.

In the eighties, observations on creep in gas-filled solution-mined caverns and in salt mines, alongside development of FEM codes input allowed a better match between forecast and real behaviour, with evidence of the importance of time factor, deviatoric stresses and pressure history (low pressures and drop rate). These advances enabled GEOSTOCK to determine up-to-date parameters for the Manosque rocksalt and to model the behaviour of existing caverns from mining in 1969 over the next 20 years, followed by conversion to gas storage in association with GAZ DE FRANCE, with an internal pressure varying from 18 MPa down to 6 MPa.