

The Influence of the Stress-Strain State Change on Rock Salt Shielding Properties

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INTRODUCTION

The spreading of the storage of liquid and gaseous hydrocarbons in underground caverns made in rock salt deposits began early in the 1950s.

Thus, by now the service life of the existing caverns amounts to several decades. Over this period, a conjuncture of the market of hydrocarbons changed substantially to result in the conversion of some underground storages (i. e. transfer on other stored product), the conservation or abandonment of some underground caverns, the stiffening of the ecological requirements.

To solve problems connected with the technical effect of underground caverns on the interior of the earth, a need arose to carry out a study involving investigation of changes in the technical and geological characteristics of rock salts due to stress redistribution in the vicinity of the underground cavern. It is primarily true for studying permeability of the pore and fracture space in rock salt (Walner, Paar, (1997); Bochkareva, (1998); Pfeifle et al., (1998)).

The practical sense of such studies is connected with the prognostic estimation of the following:

- preservation of tightness of underground caverns after taking them out of service and conservation;
- losses of commercial petroleum derivatives held back in the pore space of the zone adjacent to the contour of the cavern;
- thickness of the contaminated zone in the vicinity of the cavern which should be treated during conversion for the storage of ultraclean products;

- the increase in the strain of rock salt in the course of the saturation of the zone adjacent to the contour of the cavern with liquids (brine, hydrocarbons).

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