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A TECHNICAL SOLUTION FOR THE COLLAPSE FRAGMENTATION OF THE FIELD 2 CAVERN – OCNELE MARI, ROMANIA

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Abstract

The cavernometric measurements of September 1993 carried out by SOCON (Germany) have revealed the existence in Field II of Ocnele Mari of 5.5 million m^3 of pressurised brine extending over 10.5 ha at about 100 to 120 m underneath a densely populated area. Since no similar cases could be found in the literature, no procedure was already available for neutralising the evolution of this cave.

Following a series of cave ins reported at the northern limits of the cave in September 2001 and July 2004, it was concluded that the collapse of the cave's ceiling is a continuous and irreversible process. By understanding the evolution of the geo-mechanical processes that affect the cave, we propose a logical succession of works meant to eliminate the risks associated with its gradual collapse. This includes the following operations:

- Detection and exploitation of the remnant isolating fluid;
- Prevention of an uncontrolled collapse, with potentially devastating effects on the town of Ocnele Mari, through the artificial fragmentation of the collapsing process;
- Slow injection of the largest possible volume of sterile sediments in the central-southern part of the cave with the elimination of an equal volume of brine to preserve the stability of the disintegrated deposits which entered the cave from the north, as well as the overall stability of the northern hills;
- Transformation of the pressurised cave into an unconfined hydraulic system to be finally filled with the collapsed deposits.

Results of the above activities, along with encountered difficulties are subsequently presented.

Key words: Cavern Plugging and Abandonment, Instrumentation and Monitoring, Lateral Drilling, Rock Mechanics, Romania, Salt Dissolves, Subsidence.