

SURFACE SUBSIDENCE MEASUREMENTS ON TERSANNE CAVERN FIELD (bedded salt formation, France)

by
J. G. DURUP
 GAZ DE FRANCE

I - INTRODUCTION

GAZ DE FRANCE has two underground solution-mined storages : ETREZ and TERSANNE. Cavity leaching started on the ETREZ site in 1977 and with already twelve caverns in operation, this site is still in its development phase.

TABLE 1 : VOLUME DIMINUTION IN TERSANNE CAVITIES

Cavity number	Leaching period	Cavity volume (x 1 000 m3)	
		Initially (1)	1989 (2)
TE 01	69-70	118.8	66.2
TE 02	68-70	89.8	59.7
TE 03	75-77	117.7	102.5
TE 04	74-77	193.0	170.1
TE 05	74-76	134.1	108.5
TE 06	75-78	188.5	168.9
TE 07	75-79	199.9	180.0
TE 08	77-80	191.8	170.5
TE 09	77-80	174.3	154.2
TE 10	78-82	187.6	169.9
TE 11	79-83	187.1	176.3
TE 12	80-84	153.5	153.0
TE 13	81-85	211.6	210.6
TE 15	81-85	200.4	199.6

(1) Sonar surveys at end of leaching.
 (2) Current volume calculations.

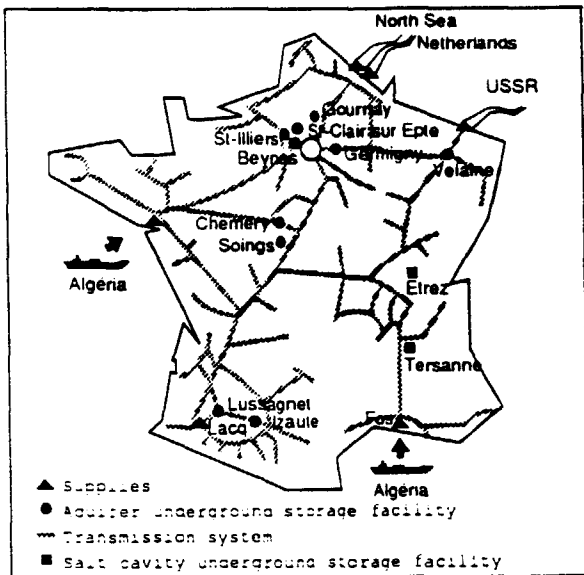


Fig. 1 Natural Gas in France

The fourteen cavity TERSANNE project was carried out from 1968 to 1986 and now offer a storage capacity of 440 million cubic meters (n) of natural gas ie. 5 billion kWh. Engineering design and construction of underground facilities are handled by the Research and Development Division (D.E.T.N.) of GAZ DE FRANCE whereas design and construction of the surface plant as well as operation of the storage facility are handled by Production and Transmission Division (D.P.T.) of GAZ DE FRANCE. Cavern convergence of cavities has been a matter of concern since beginning of project (Table 1) and inevitable subsequent influence on overburden led to the need for careful surface subsidence monitoring.