

## **Repair of defects in cemented casing in the Rüstringen salt cavern storage field in Germany by running thick wall liners**

### **Abstract**

The Rüstringen cavern field is part of the German strategic crude oil reserve in the responsibility of EBV (Erdölbevorratungsverband). The plant is operated by NWKG (Nord-West Kavernengesellschaft).

The first wells in the cavern field were drilled at the end of the sixties and completed with 13 3/8" casing (cemented). A total of 36 caverns were solution mined and filled with oil.

Approximately 25 years later, extra load was encountered when pulling a 10 3/4" variable casing during a regular workover. A caliper log run inside the 13 3/8" casing revealed casing deformation (ovality) within the salt section.

As part of the regular workover schedule, another 22 cavern wells were caliper logged and also found to have casing deformations / irregularities of various intensities.

A concept for stabilising the 13 3/8" casing (last cemented) was developed. This concept is currently being implemented and seven cavern wells have now been successfully completed with 10" thick wall liners cemented inside the 13 3/8" casing.

This paper covers the following points:

- relevant data on the Rüstringen cavern field
- detection, measurement and evaluation of ovalities
- a concept for stabilising the critical section of the 13 3/8" casing
- running / cementing the 10" liner
- expert reports / outlook