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Abstract

This technical paper outlines the first official information release about the deployed technical methods and methodologies, which have been successfully used to localize and identify the technical leakages in conjunction with the oil storage system Epe S5. It technically describes the procedure of exclusion, the aimed design of several partial MITs (gas and hydraulic Mechanical Integrity Tests) and further leak tests to determine the current amount and flow characteristics of the leak.

The salt cavern S5 is one of three caverns in Gronau-Epe in Germany, which has been used to store flexible oil reserves in Germany. This cavern is operated by *SGW-Salzgewinnungs-gesellschaft Westfalen mbH* on behalf of the user of the cavern. On 14th February 2014 a few hundred meters away from the cavern S5 three oil spills on the surface have been detected. SGW immediately shut down the cavern, triggered the alarm chain and necessary safety measures have been started.

The very first important issue to be clarified was to localise the source of the oil escaping to find out where the oil leakage(s) could be, therefore the whole oil storage system in its entirety had to be technically addressed. Thus all of the serial interfaces within the storage system had to be precisely scrutinised. As the system encompassed widely ramified grid it was very crucial to apply the procedure of exclusion to minimize distortion and increase the likelihood of occurrence.

A very decisive factor was to expedite troubleshooting procedure to avoid possible further escaping of the storage medium. For reliable investigation purposes the leak system was divided in defined sections, which have been tested separately.

By following the aforementioned procedure of exclusion and tracing the obtained result of each partial test the position of the leakage has been precisely localised and technically sealed.

The technical charts, diagrams and tables could contain some technical data depicted only in letters and percentages for the sake of understanding. This is necessary as the investigations are still ongoing.

Keywords:

Germany; Cavern Testing; Cavern for Liquid Storage; Corrosion; Hydraulic Fracturing; Oil Leak; MIT; Tightness Test; Troubleshooting; Salt Cavern; National Oil Reserves; Oil Cavern; Gas Test; Hydraulic Test; Leak Test; Leak Detection; Long-Term Detection; Determining of Recovery Pressure Epe; long-term Recovery tests.

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