Oil & Gas

AKER Solutions

Accelerated ageing of elastomeric parts

Aker Solutions checked the longevity of its Riserlock connections elastomeric components.

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OUR CUSTOMER

Corporate name
Aker Solutions

Business activity
Engineering and manufacture of Subsea equipment

2014 turnover
3.6 billion Euros

Workforce
16,700 people

Aker Solutions is a Norwegian group that supplies Subsea equipment between the well head and the platform to major oil & gas firms. In conjunction with one of its main customers, the company has developed a new riser connection (the pipeline connecting the platform to the sea bed) that includes elastomer parts. Both partners decided to estimate the service life of these parts in order to determine when they would need to be replaced.

Several collaborative projects

Aker Solutions commissioned Cetim to work on the development of the protocol and test setups in addition to analysis and control of the study. *"We had to simulate various stresses: salt content of the water, pressure, oxidation cycle as well as the microbial growth and activity"*, explained Mathieu Sicard, Project Engineer at Aker Solutions. The tests were carried out in cooperation with the LRCCP (Laboratory of research and inspection of rubbers and plastics) and the Saint-Étienne Institute of Corrosion, in order to offer a comprehensive service. Test were performed in order to mechanically characterise the elastomer components and to check elasticity after compression without crack. During the ageing tests, the parts are compressed and placed in a vessel with salt water whose composition is controlled and flushed with sulphuric acid to simulate the microbial growth. Several tests are carried out at varying temperatures of the salt medium. At specific times, the parts are extracted to characterise and monitor the changes in their elasticity and thereby infer the ageing. In addition, tensile, compression and hardness tests were carried out on standardised specimens as well as dimensional and weight measurements, in order to analyse changes in the nitrile rubber. In addition to these tests, material storage in accelerated conditions was simulated.

"This polymer formulation is not traditionally used in sea water", added Mathieu Sicard. *"The data collected will help us in-house to establish a law used to calculate the service lives of future parts".*

Cetim's asset

Cetim combines expertise in mechanics and material science in collaboration with partners to meet customer technical requirements.

Contact
Question and Answer Service
Tel.: +33 (0)3 44 67 36 82
sqr@cetim.fr
cetim.fr

1606-055

INSTITUT CARNOT Cetim

cetim