

Stir

# Assessing integrity and repairability

Cetim was asked by the Tunisian Technical Centre for Mechanical and Electric Industries to carry out an overall diagnosis on three spherical tanks. A perfect example of partnership.

The Stir Company (Société tunisienne des industries du raffinage, Tunisian refining industry company) has, among others, a storage spherical tanks with a 4,000 m<sup>3</sup> capacity which exhibited diametrically opposite flaws on the lower circumferential weld. Stir wanted to assess the integrity and the repairability of this equipment and decide on its periodical requalification. Consequently, Stir contacted the Cetime (Centre technique des industries mécaniques et électriques, the Tunisian Technical Centre for Mechanical and Electric Industries), a company under supervision of the Tunisian Ministry of Industry and Technology. The mission of this centre is to assist industrialists

within the scope of industrial modernisation, technological improvement and quality. Within the framework of a long-lasting partnership, the Cetime regularly consults Cetim in its fields of expertise, especially for non-destructive testing (NDT).

## Acoustic emission testing

Cetim recommended to start its service with an overall acoustic emission test in order to determine areas which could have flaws likely to grow. Advanced NDT methods such as "TOFD" (Time Of Flight Diffraction) and phased array probes were used to characterise the geometry of the detected defects. A "boat-shaped" type sample, containing the flaw, was taken



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in order to determine the root cause of the failure.

On these grounds, a welding repair procedure was drafted. The areas repaired with this method were then submitted to additional non-destructive tests. Calculations of the residual service life were then carried out based on the collected data. This service led to the validation of the requalification file.

Kais Bouaziz, responsible for the inspections, mechanical tests and welding projects in Cetime, says as a conclusion: "This project allowed us to develop a reliable methodology for the assessment of the integrity of the LPG storage spherical tanks. This methodology is based on advanced non destructive testing methods associated with metallurgical examinations and with calculation and modelling methods."

## OUR CUSTOMER

**Company name**  
Stir

**Activity**  
The Société tunisienne des industries de raffinage (Stir, Tunisian refining industries company) was founded in 1961 based on a convention between the Tunisian Government and the ENI Italian Group. In 1974, Stir became a company owned by the Tunisian government, and was put in charge of satisfying Tunisia's need for fuels

**Sales turnover**  
2.2 billion dinars exclusive of tax (approximately 1.02 billion euros)

**Workforce**  
410 persons

## Cetim's asset

Cetim has recognised expertise in non destructive testing which allows it to offer a comprehensive set of services adapted to the needs of the customers. The CETIME - CETIM partnership, established more than 20 years ago, made it possible to carry out this technical service.

