



Hydrogen Induced Cracking Detection using Acoustic Emission

As a plant operator, you will know that exposure to wet H₂S solutions can make your steel based assets susceptible to hydrogen induced cracking (HIC). However because the resultant damage mechanism may occur near the weld or plates, and at many depths below the steel's surface, it is often difficult to detect until the degradation has progressed significantly.

TWI's Acoustic Emission Hydrogen Induced Cracking detection system (AEHIC) provides a means of identifying whether hydrogen induced cracking is going to occur, or is already in progress including how it is evolving. The resulting information can then be applied to limit the potential for pipework damage or failure, giving you greater control over your plant's operation and performance.

Acoustic emission testing for monitoring HIC damage is recommended by API-571 (API, 2003).

Capabilities

- Detection of three HIC evolution phases for unstressed sour service assets when the system has been installed at an early stage:
 - hydrogen gas nucleation on the component's surface
 - cracking with de-cohesion of weak steel interphases
 - crack propagation under high internal pressure.
- Provision of real time monitoring and results

Applications

- Structural health monitoring of assets in the refining industry that are diagnosed as potentially suffering from HIC, or hydrogen blistering which can lead to HIC
- Monitoring of plant assets exposed to wet H₂S solutions
- Utilisation of results for risk based inspection planning
- General cracking activity monitoring

Key specifications

- 4" touch-sensitive screen
- 4 status LEDs for easy visual inspection of operation
- Integrated sensor signal conditioning circuitry
- 2-32GB storage using internal SD card
- Mains power for unattended operation or portable option with battery bank module
- Data transmission capture via the AEHIC wireless data downloader or a centralised management system



Get in touch – AEHIC can significantly minimise the potential for unscheduled downtime or even failure. Talk to us today about a solution to fit your asset's requirements.