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FITNESS FOR SERVICE BROCHURE – PART 1- DETERMINISTIC APPROACH

THE DETERMINISTIC APPROACH

At Pecanhood, this method is safely applied to Longitudinal and Circumferential corrosion features, Dent/Corrosion features, Weld features and Mill features and each feature is assessed differently, due to unique fracture mechanics.

Although the assessment of features is an important step of Integrity management program. Inspection is a pre-requisite of the holistic process. Features can only be identified through a sound Inspection regime. In doing so, emergency situations such as leaks and ruptures can be avoided.

Figure 1 Typical External Corrosion feature on a high pressure steel pipeline

ASSESSMENT OF PIPELINE FEATURES, APPLYING THE DETERMINISTIC APPROACH

CORROSION FEATURE ASSESSMENT CODE

To demonstrate that Corrosion anomalies/features are acceptable or fit for service under the Maximum Allowable Operating Pressure (MAOP), the deterministic assessment is solely applied to identify those defects which will require immediate repair. This is an important first step in ensuring Pipeline Integrity, in response to inspection results..

The following Assessment codes are applicable to circumferential and Longitudinal corrosion features only: ASME B31G, Modified B31G, DNV RP F101 and the Kastner method.

DENT FEATURE ASSESSMENT CODE

If a Dent feature is associated with a Corrosion feature, we first assess the corrosion using ASME B31G, secondly we assess the dent depth to diameter ratio. We verify if the dent dep./dia. is less than 6%.

'In the Deterministic approach, the methodology is quite conservative and less complex. The objective is to assess if features are below or above the failure curve'.

WELD FEATURE ASSESSMENT CODE

To assess Weld Features, we apply a simple screening calculation using API 579 level 1 assessment. This will determine if the weld feature is acceptable or not.

The level 2 assessment in API 579 is dependent on the accuracy of pipeline material parameters, loads. Here we apply the Fracture Mechanics Failure Assessment Diagram (FAD).

MILL FEATURE ASSESSMENT CODE

Mill features are considered stable threats, according to ASME B31.8S list of 22 threats. These features are assessed using corrosion assessment codes, but no growth (Corrosion) rate is applied.

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OBJECTIVE

The objective of assessing metal loss features on steel pipelines, is associated with plotting the features on the Failure Assessment Diagram(FAD). In the Deterministic approach, the methodology is quite conservative and less complex. The objective is to assess if features are below or above the failure curve. If a metal loss feature is above the failure line, then it's considered unacceptable and should be repaired immediately. It is worth noting that features which are below the assessment lines should be checked if the critical rupture length is not too close. Through experience and considering reporting uncertainties, it's worth more to investigate such anomalies. The latter is addressed by applying the Probabilistic approach.

PECANHOOD INTEGRITY LTD. VALUE PROPOSITION

Pecanhood Integrity Ltd is a specialized Engineering consulting firm, established in 2015, to provide specialized skills and support to the Oil and Gas, Mining and Power Generation sectors. Quite simply, our services are targeted towards Plant and Pipeline Asset Integrity and Process Safety challenges. We provide professional and Data driven insights in order to restore the Reliability and Integrity, while avoiding and preventing Emergency situations such as ruptures, societal risks and environmental damage.

We provide a holistic approach ranging from Pipeline Integrity Management (PIM), Pipeline Fracture Mechanics services, Engineering Critical Assessment (ECA), Risk Based Inspection (RBI) programs, Management consulting, Project Management services, Process Safety Management services, Advanced Technical Training. Quite recently, through our global partnerships, we now offer professional support on Integrity Services and Distribution of Innovative and high Quality Composite Repairs products through our Global partners Rosen Group (http://www.rosen-group.com) and 3X Engineering (http://www.3xeng.com) respectively.

We are 'Your Asset Integrity Management Partner' in Africa.

GET IN TOUCH WITH US

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