عنوان مقاله:

Assessment of Failure Mechanisms in an Industrial Firewater Pipeline: A Case Study

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خلاصه مقاله:

In this case study, the major mechanisms contributing to failure of a petrochemical firewater (FW) pipeline were assessed. The outer surface of FW pipe exhibited general corrosion and formation of noticeable pits due to separation of wrapping coating. The results of XRF, EDS, and XRD analysis demonstrated the presence of Fe۲O۳, CaCO۳, SiO۲, and NaCl indicating the presence of iron oxide (Fe۲O۳) and silica (SiO۲) as corrosion products, and CaCO۳ and NaCl as sediments found in water. The formation of deposits (precipitates) on the whole internal surface of the pipe and occurrence of general corrosion, under-deposit corrosion, and tuberculation was confirmed by visual inspection and microscopic examination (SEM). The deposits formed in the pipe may originate and/or accelerate corrosion through forming oxygen depleted area under deposit, playing as anodic region compared to the surrounding area and lead to more aggressive corrosive attack under the deposit. Moreover, the tubercles were the main reason of formation of oxygen concentration cells as the oxygen-deficient sites beneath the tubercles playing as anodic regions .and surrounding areas act as cathodic regions resulting in localized corrosion

کلمات کلیدی:

corrosion, Deposits, Failure, Firewater Pipeline, Tuberculation