

STRUCTURAL INTEGRITY FOR DOWNSTREAM OPERATIONS IN THE OIL INDUSTRY

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ABSTRACT

This paper addresses problems of structural integrity of steel in downstream operations in the oil industry. A mesoscale approach is examined for plant condition monitoring, on-line corrosivity measurement, material degradation and fracture mechanics, especially in situations of aggressive environments, stresses, and temperatures. The first step in this research involves comprehensive structural integrity appraisal to identify the regions where corrosion and cracks are most likely to occur so that condition monitoring and NDE can be concentrated appropriately --- "finding where to look". The processes adopted to achieve this include *mapping* of the range of mechanisms, *modelling* of the individual processes and *monitoring* via a range of complementary techniques. The commercial incentive for this work is enormous. The paper discusses the approach taken to address the multi-disciplinary technology needed to meet the goals of improved operational efficiency, engineering reliability and safety. The issues arising from the integration of sensor/probe methodologies, signal analyses and operational materials performance are examined and discussed.