

## Gulf Coast Refinery Solves Long Term Corrosion Problem by deploying 3D TRASAR® Technology for Crude Overhead Systems

REFINING PROCESS TREATMENT

Gulf coast refinery had a history of corrosion failures in the crude unit overhead exchangers for the past 10 years costing the refiner in excess of \$1.0 MM/year in equipment, labor, and lost production. The refinery in question was plugging tubes, retubing exchangers, or replacing exchangers as frequently as every eighteen months. Refer to Table 1 for a corrosion history. The biggest problem the customer faced, in trying to resolve this persistent corrosion problem, was clearly identify the contributing factors and directly linking these to unit performance and the exchanger failure rate. Table 4 summarizes the corrosion history for this system.

The customer goals were to eliminate or drastically reduce the corrosion allowing them to run turnaround to turnaround without suffering any downtime or lost production due to corrosion failures. In addition to the

direct costs poor overhead performance was increasing the refiners safety, and environmental exposure. Despite valiant efforts poor corrosion performance could not be significantly reduced with the application of a traditional chemical treatment program. It was suspected that much of the corrosion damage occurring was episodic in nature and the direct result of operational changes. The customer needed a simple way to measure and track the corrosive conditions resulting from changes in operation linking these directly back to corrosion performance.

To meet the customers needs Nalco deployed our new 3D TRASAR Technology for Crude Overhead Systems. The 3D TRASAR for Crude Overhead Systems analyzer takes a stream of crude unit overhead sour water and in real time determines the

Table 1

Inspection History			
Year	Exchanger #1	Year	Exchanger #2
Year 1	Bundle replaced	Year 2	Bundle replaced
Year 2	Retube C-E-1D installed	Year 3	Inspection
Year 3	Retube	Year 5	514 tubes plugged
Year 4	10 leaking tube	Year 6	Bundle replaced
Year 5	14 leaking tubes	Year 7	Passed inspection
Year 7	120 tubes plugged	Year 9	1 tube plugged
Year 8	235 tubes plugged	Year 9	310 tubes plugged
Year 9	Retube	Year 10	Bundle replaced
Year9	1 tube plugged	Year 12	Spare bundle installed
Year 11	Bundle replaced	Year 13	1 tube 60% wall loss
Year 12	Inspection no repairs		
Year 12	Inspection no repairs		
Year 13	Spare bundle installed		

# Corrosion Potential Refinery Overhead Systems

**Joacim Rocklöv**



## **Corrosion Potential Refinery Overhead Systems:**

**Fouling in Refineries** James G. Speight, 2015-05-14 Fouling in Refineries is an important and ongoing problem that directly affects energy efficiency resulting in increased costs production losses and even unit shutdown requiring costly expenditures to clean up equipment and return capacity to positive levels This text addresses this common challenge for the hydrocarbon processing community within each unit of the refinery As refineries today face a greater challenge of accepting harder to process heavier crudes and the ongoing flow of the lighter shale oil feedstocks resulting in bigger challenges to balance product stability within their process equipment this text seeks to inform all relative refinery personnel on how to monitor fouling characterize the deposits and follow all available treatments With basic modeling and chemistry of fouling and each unit covered users will learn how to operate at maximum production rates and elongate the efficiency of their refinery s capacity Presents an understanding of the breakdown of fouling per refinery unit including distillation and coking units Provides all the factors crude types and refining blends that cause fouling especially the unconventional feedstocks and high acid crudes used today Helps users develop an analysis based treatment and control strategy that empowers them to operate refinery equipment at a level that prevents fouling from occurring *Dewatering, Desalting, and Distillation in Petroleum Refining* James G. Speight, 2022-12-13 This book presents a detailed and practical description of various processes dewatering desalting and distillation that prepare refinery feedstocks for different conversion processes they will go through Relevant process data are provided and process operations are fully described This accessible guide is written for managers professionals and technicians as well as graduate students transitioning into the refining industry Key Features Describes feedstock evaluation and the effects of elemental chemical and fractional composition Details the equipment and components and possible impacts due to composition Explores the process options and parameters involved in dewatering desalting and distillation Considers next generation processes and developments [Proceedings - Refining Department](#) American Petroleum Institute. Refining Department, 1979 *Hydrocarbon Processing* , 1986 **Gas Engineering** James G. Speight, 2021-09-20 Volume 1 deals with the origins of process gases and describes recovery properties and composition It covers as well the shale gas the production from hydrocarbon rich deep shale formations being one of the most quickly expanding trends in onshore domestic gas exploration Vol 2 Composition and Processing of Gas Streams Vol 3 Uses of Gas and Effects *Natural Gas* James G. Speight, 2018-11-26 Natural Gas A Basic Handbook Second Edition provides the reader with a quick and accessible introduction to a fuel source industry that is transforming the energy sector Written at an introductory level but still appropriate for engineers and other technical readers this book provides an overview of natural gas as a fuel source including its origins properties and composition Discussions include the production of natural gas from traditional and unconventional sources the downstream aspects of the natural gas industry including processing storage and transportation and environmental issues and emission controls strategies This book presents an ideal resource on the topic

for engineers new to natural gas for advisors and consultants in the natural gas industry and for technical readers interested in learning more about this clean burning fuel source and how it is shaping the energy industry Updated to include newer sources like shale gas Includes new discussions on natural gas hydrates and flow assurance Covers environmental issues Contain expanded coverage of liquefied natural gas LNG

**Handbook of Pollution Prevention and Cleaner Production Vol. 1: Best Practices in the Petroleum Industry** Nicholas P Cheremisinoff, Paul E. Rosenfeld, 2009-09-22 This new Handbook provides a series of reference guides to cleaner production methods technologies and practices for key industry sectors Each volume covers for each industry sector the manufacturing technologies waste management pollution methods for estimating and reporting emissions treatment and control technologies worker and community health risk exposures cost data for pollution management cleaner production and prevention alternatives Best Practices in The Petroleum Industry provides an overview of refineries and gas plant operations and identifies the key Environmental Aspects supported by case studies of major incidents that resulted in catastrophic releases of oil and refined products and a critical assessment of the methodology and calculation procedures that the industry relies on in preparing emissions inventories The authors offer alternative approaches to providing more accurate emissions estimates and guidelines on cleaner production and pollution prevention practices for improving overall environmental performance Overview of the key Environmental Aspects of gas plant operations and refineries Case studies of major incidents that resulted in catastrophic releases of oil and refined products including the Santa Barbara oil spill of 1969 and the EXXON Valdez incident Provides guidelines on cleaner production and pollution prevention practices for improving overall environmental performance

*Encyclopaedia of Occupational Health and Safety* Jeanne Mager Stellman, 1998

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