Root Cause Failure Analysis of

Pyrolysis Furnace Crossover Piping Systems

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Numerous degradation mechanisms including failures on external crossover 304H stainless steel components / connections have been experienced. Five different failure locations were analyzed through Root Cause Failure Analysis (RCFA) generating some potential 39 recommendations. Understanding the damage mechanisms came from much destructive analysis, literature searches, and internal research. The purpose of this paper is to share the methodology used to analyze the various damage mechanisms experienced and identify root causes. This paper attempts to focus on the overall scope of the problems and efforts to understand the problems through RCFA vs. focusing on the damage mechanisms individually.

Key Words: ethylene cracking, 304H stainless steel, metal dusting, carburization, catalytic coke formation, coefficient of thermal expansion, sigma phase, root cause failure analysis.