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Name : Eric Gebhard
Company : Koch Engineered Solutions
Current Position : Sales Manager



Working Experience : 13 years

**Presentation Topic : Leveraging Connected Digital and Analytical Tools to Address
Furnace Specific Combustion Inefficiencies at GC Olefin Plant**

Presentation Abstract [1-3 Lines] :

PTT Global Chemical Company Limited (GC) partnered with John Zink Hamworthy Combustion (JZHC), a Koch Engineered Solutions company, to improve furnace combustion performance of their ethylene production fleet, through actionable recommendations from JZHC's EMBER™ service.





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Name : **Miss Karnchana Kongsri**

Company : **PTT Global Chemical Public Company Limited**

Current Position : **Process Engineer**

Working Experience : **10 years**

Presentation Topic :



Presentation Abstract [1-3 Lines] :

**Leveraging Connected Digital and Analytical Tools to
Address Furnace Specific Combustion Inefficiencies at GC Olefin Plant**

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Abstract

Conventional furnace optimization techniques leverage global instrumentation to monitor combustion health and drive toward a desired setpoint through process control. However, this system alone ignores the influence that burner operation has on the ability to maintain these targets continuously. As a result,



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unaddressed burner inefficiencies lead to lost opportunity on short-term profitability and long-term asset reliability basis. The degree to which this is realized only occurs after a significant amount of damage has been done to the equipment or production opportunity has been missed. While monitoring and control technology will continue to improve and provide greater value, addressing local combustion inefficiencies with solutions rooted in subject matter expertise translated into actionable insights, are key to systematic and sustainable optimization.

PTT Global Chemical Company Limited (GC) partnered with John Zink Hamworthy Combustion (JZHC), a Koch Engineered Solutions company, utilizing EMBER™, to improve furnace operational performance of their ethylene production fleet, through actionable recommendations based on combustion insights and empirical performance observations. JZHC's connected digital platform and data analytics are employed to mitigate non-uniform process Coil Outlet Temperatures (COT) and Tube Metal Temperatures (TMT), while maintaining desired global excess air targets across a fleet of furnaces with multiple burner designs, arrangements, and layouts. The combination of JZHC combustion subject matter expertise, EMBER algorithms, and empirical data are used to curate on-going actionable insights for field operators to optimize furnaces. This process has enabled improvements of thermal efficiency, process yield, and longer run length.

This platform has also been used to connect burner design knowledge with operations to provide insights that would otherwise require additional instrumentation or control points. Back calculations of target wall fuel pressure needed to achieve desired percent-of-total firing splits have been utilized, in parallel with the existing closed-loop control scheme, to reduce non-uniform heat flux profiles, further reducing COT variability leading to improved process yield.

The delivery of actionable combustion insights through EMBER has enabled the use of strategies that had not been previously considered or were too hard to systematically execute given the complexity of their computation. This, in turn, led to enhanced operational flexibility and has promoted proactive burner tunings to ensure furnaces are operating at an optimized Energy Intensity (EI) given the existing unique system limitations, constraints, and evolving market conditions.

Keywords: Digital; Combustion; Fired Heater; Efficiency Improvement; Carbon Reduction