

Crude Oil Facility Realizes 60% Reduction in Compressor Operational Costs from AMS™ Suite: Equipment Performance Monitor



RESULTS

- Identified under-performing recycle gas heaters impacting downstream operations
- Heater cells showed variable performance revealing reduced control operation
- Up to 60% credible improvement in reducing compressor operating costs
- Targeted best maintenance schedule for filter replacement
- Improved steam-water balance and stability following identification of poor blowdown control on reformers



APPLICATION

Refining of crude oil.

CUSTOMER

Petrolera Ameriven — Industrial Complex José Antonio Anzoátegui — Venezuela.

CHALLENGE

Petrolera Ameriven is the operator for one of the strategic associations producing and upgrading crude oil from the Orinoco Heavy Oil Belt.

As part of its operations, Petrolera Ameriven is operating an Upgrader at José, close to Puerto La Cruz in Anzoátegui, Venezuela. Petrolera Ameriven required a system that would allow them to achieve optimum performance of their critical assets - notably compressors and heaters. Possessing information on under-performing equipment allows improved planning and facilitates predictive maintenance. In addition, the capability to remotely monitor, diagnose and share information between each of the consortium members was seen as an ideal match to meet their requirements.

SOLUTION

Petrolera Ameriven selected Emerson's AMS™ Suite for condition based monitoring and performance monitoring of process and mechanical equipment, instruments and valves on the Industrial Complex José Antonio Anzoátegui.

“We are working closely with Emerson to identify performance issues that allow us to be proactive with our operational and maintenance activities.”

Cesar Malpica,
Reliability Superintendent



For more information:
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As part of this integrated solution, AMS Suite: Equipment Performance Monitor is being used to analyze the operating efficiency of compressors, reformers, steam boilers and fired process heaters. This tool was paramount during the start-up phase of the plant operation. Teams from Petrolera Ameriven and Emerson worked closely during this stage to provide a baseline for the performance of the major asset's for further evaluation during each assets life cycle.

AMS Performance Monitor was able to prove that the recycle gas heaters were significantly under-performing compared to design conditions. This included the gas exit temperatures that impact downstream operation. Consequently, the thermal efficiency of the heater was low resulting in higher than expected stack temperatures. In addition, the oxygen levels in the stack were high level, resulting in poor thermal performance.

Each heater cell within the vacuum heaters was compared to show variable performance between each pass in the same heater. The operating parameters revealed differing control operation between the cells. Based on this information Petrolera Ameriven was able to make operational changes to minimize variability of unit operation.

The operation of the first stage of the coker gas compressor was shown to be under-performing with reference to design operation. Following changes to upstream setpoints, the performance significantly improved as a result of the physical operating parameters. This type of change can be translated to an improvement of up to 60 percent reduction of operational costs.

Each of the utility air compressors showed varied performance for what are ultimately identical units. As a result, targeted maintenance was carried out knowing the projected drop in inlet filter pressure.

The hydrogen reformers were showing higher than anticipated thermal efficiency from heat balance based on instrumentation. The instrumentation was checked. The determined performance details of the heat recovery boiler allowed targeted identification of degradation. This led to an improvement in steam-water balance and boiler stability from identification of poor blowdown control.

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AMS Suite: Equipment Performance Monitor powers PlantWeb with predictive and proactive maintenance through performance monitoring of process and mechanical equipment to improve availability and performance.

“Combining the skills of our team with the expertise and knowledge that Emerson provides allows us to be more efficient and extend the life cycle of our assets.”

Cesar Malpica,
Reliability Superintendent

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