Abstract

Objectives/Scope: Managing site energy utilization has always been crucial for ensuring efficient and environmentally friendly operations. Gas Treating (GT) Acid Gas Removal (AGR) energy utilization, i.e. amine chilling and process cooling are directly dictated by amine circulation. Design amine ratio cannot be reliably applied to drive AGR energy usage to optimum point as it fails to consider the dynamics of other process parameters, i.e. train capacity and amine strength. This potentially hinders AGR Unit operations from its optimum operating point. A smart advisory platform needs to be developed to dynamically assist pinpointing the trains optimum operating point in order to proactively drive site energy optimization and decarbonization campaign.

Methods, Procedures, Process: Comprehensive technical assessment assisted by hybrid PROMAX and HYSYS simulation has been completed and managed to develop a “GT AGR Energy Optimization Smart Dashboard,” which intuitively provides a smart advisory tool in a digital-interface form. This manages to dynamically drive site energy utilization to minimum point and thereafter decarbonize the site carbon footprint.

Results, Observations, Conclusions: The fully deployed smart dashboard is able to prescribe a reliable optimum amine rate as a dynamic operating envelope in order to drive AGR energy utilization to optimum point. Moreover, it managed to map AGR energy utilization and corresponding energy saving as well as vigilantly monitoring site decarbonization performance. This initiative directly contributed to energy usage optimization associated with process cooling requirement as well as actively contributed to reducing site carbon footprint up to 12% as an intangible benefit.

Novel/Additive Information: This assessment showcases an innovative approach to embrace technical challenges through digital-interface platform in order to proactively drive site energy optimization and decarbonization campaign.