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A Case History of Refractory Lining Improvements for O2-Enriched Furnace Service (You Don't Know What You Don't Know)

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Abstract

A refinery with two existing Ortloff designed sulfur recovery units (SRUs), installed in 1983 and 1993, has operated both units with occasional low level oxygen enrichment. As part of a refinery project, two new Ortloff designed SRUs, designed for both air only operation and low level oxygen enrichment, are currently under construction at this same refinery.

The initial basic engineering design for these new SRUs included a reaction furnace refractory lining system for high temperature service based on the same Ortloff furnace geometry and lining system design guidelines used in the two existing SRUs. The Refiner had experienced recurring furnace refractory failures and maintenance issues over the 15- to 25 year operating history of the existing SRUs, and recognized an opportunity to improve refractory reliability and service life in the new units.

The Refiner prepared a summary of inspection reports documenting the furnace refractory issues for the existing units and presented this summary to Ortloff with the goal of incorporating refractory design improvements into the new SRUs. Ortloff then worked with Thorpe, a refractory engineering and

construction company, to redesign and upgrade the SRU furnace geometry and refractory lining system for increased reliability in the high temperature service associated with low-level oxygen enriched service.

This paper presents the experiences and perspectives of all three parties: the process licensor (Ortloff), the owner (Refiner), and the refractory contractor (Thorpe). It further discusses the project execution philosophy employed to assure implementation of the new refractory design features and describes the technical improvements made to the refractory lining system.