

PRIMARY REFORMER

CASE STUDY



A 900 STPD ammonia producer realized over \$700,000/yr in increased production utilizing ZoloSCAN TDL measurements.

KEY ISSUES

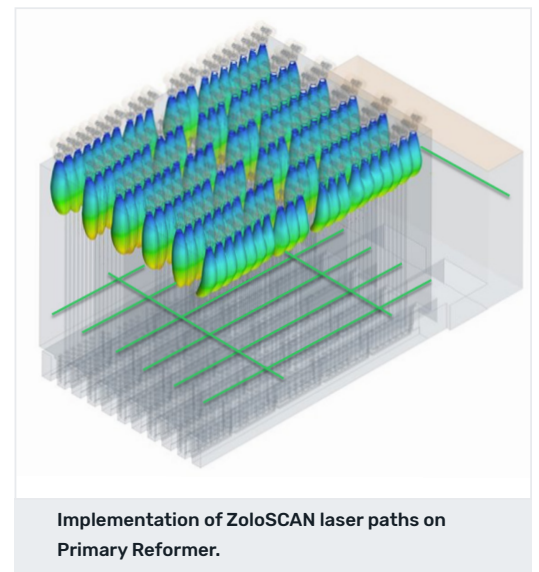
Limited measurements within the furnace led to suboptimal reformer operation.

- ▶ Single oxygen measurement was not sufficient to guide reformer optimization.
- ▶ Existing TDL sensor was not reliable and required excessive maintenance and calibration.
- ▶ Reformer based combustion imbalances led to localized hot spots, CO and NOx excursions, and reduced hydrogen production.

KEY ACTIONS

Installed ZoloSCAN system to provide real-time, in-furnace zonal measurements of temperature, oxygen, and CO.

- ▶ Identified and corrected regions of depleted excess oxygen within the reformer.
- ▶ Mitigated hot spots on tubes by optimizing combustion profiles and firing across each burner row to increase tube and catalyst life.
- ▶ Increased reformer throughput by balancing air requirements between the reformer and auxiliary boiler via oxygen measurements provided by the ZoloSCAN in both locations.



Implementation of ZoloSCAN laser paths on Primary Reformer.

KEY RESULTS - \$700K IN INCREASED PRODUCTION IN THE FIRST YEAR*

- ✓ Maintained target firing profiles across the reformer
- ✓ Increased Ammonia by 3-5 STPD (200-330 MSCFD H₂)
- ✓ Delivered optimal fuel and air ratios of combustion
- ✓ Improved safety margins of reformer combustion products

* \$500/ton Ammonia • 4STPD • 350 days/yr - 1 Ton Ammonia = 68.4 MSCFD H₂