

Beyond Replacement-in-Kind: Optimizing Steaming Equipment Replacements in Sulfuric Acid Plants

MECS / Elessent Clean Technologies

St. Louis, Missouri, USA

In sulfuric acid plants, steaming equipment replacement may not be entirely straightforward. When equipment being replaced has a different design basis and/or plant capacity than the originally installation years prior, replacements-in-kind can become “replacements-in-kind-of”. New bottlenecks may arise after the installation of a replacement boiler, superheater or economizer, which can be identified through analysis of recent plant data to refine the design basis and show how existing equipment currently performs. Utilizing Elessent Clean Technologies’ extensive experience in navigating these challenges, we will discuss how to generate more accurate material balances and create a robust design basis by carefully considering the impacts of steam export pressure, equipment location and tie-ins, and duty requirements across all operating cases, along with the re-rating of existing equipment and the distribution of duty across the entire steam system.

Leak Detection and Dewpoint Measurement in Sulphuric Acid Plants

Cal Lockert, Sr. Program Director/Acid Dewpoint, Ohio Lumex

Moisture leaks in the sulphuric acid production process are highly problematic and potentially dangerous due to the resulting corrosion and formation of hydrogen gas. Identifying those leaks in the early stage, before they become catastrophic, has long been a goal of plant operators.

This presentation will help the audience understand both the actual meaning, and definition, of dewpoint. It will then illustrate how the Ohio Lumex Ei4200 works to identify both the presence of moisture and the projected onset dewpoint through a series of case studies from sulfuric acid manufacturing installations.

Finally, the data will be explored from the perspective of continuous process improvement rather than simple leak detection. This portion of the discussion is more theoretical in nature and is meant to introduce the concept of cause/effect relationships between various plant operating practices and measured movements in gas dewpoint. Again, the data presented will be from actual plant installations.

Central Florida AIChE Conference 2026

“I Love IT When A Plan Comes Together”

A Lithium Americas Update

As Colonel John “Hannibal” Smith famously quoted, “I love it when a plan comes together”. The same holds true for the Lithium Americas sulfuric acid plant.

As engineering draws to a close and construction work commences, it’s worth looking back at some of the challenges encountered and lessons learned during the engineering phase, as well as a look forward at what is to come. The current projection is for construction completion and startup in 2027.

Mr. T would agree, this ain’t no “Jibba Jabba”.

Presented by:

Mickey Jones, Project Director, Lithium Americas

Steve Puricelli, VP of Process and Technology, EXP OG&C

**Platinum-Promoted Honeycomb Catalysts –
A Versatile Technology for Sulfuric Acid Production**

Johannes Hofer, Alexander Sigg, Michael Felsberger, Paul Piantino

P&P's platinum-promoted honeycomb catalysts provide an alternative catalytic route for SO₂ oxidation, a central step in sulfuric acid production. The ignition temperature can be tailored by adjusting catalyst bed volume, and residence-time optimization further enables controlled shifts in ignition behavior.

A case study of a mid-scale plant operating in a 3+1 configuration demonstrates significant emission-reduction potential, while the transition to a 3+2 design offers additional performance benefits. Due to higher catalytic activity, lower ignition temperatures, and reduced pressure drop, P&P's platinum-promoted honeycomb catalysts represent a strong alternative to conventional vanadium-oxide systems.

Amid global decarbonization efforts, geopolitical uncertainties, and fluctuating energy markets, reducing both OPEX and CAPEX has become increasingly important. A detailed assessment of a 1000 MTPD (metric tons per day) DCDA (double contact double absorption) facility quantifies power-consumption and emission reductions achievable through catalyst replacement.

Economically, the technology offers further advantages: approximately 75% of the platinum can be recovered. Additional case studies highlight the catalysts' effectiveness for total oxidation applications involving VOCs (volatile organic carbons), CO, NH₃, and H₂S. The feasibility of thermal regeneration, as well as retrofit potential for capacity increases, further underscore the system's versatility.

2026 AIChE Phosphate Fertilizer and Sulfuric Acid Conference Abstract
Enhancing Reliability in Sulfuric Acid Plants: Technical Services Solutions

Elessent Clean Technologies

St. Louis, Missouri, USA

Sulfuric acid plants operate under highly corrosive and closely integrated process conditions where small deviations can rapidly lead to performance losses, equipment damage, or environmental non-compliance. This paper presents a practical technical services approach for monitoring, troubleshooting, and optimizing sulfuric acid plant performance with the objective of sustaining reliable, steady-state operation and minimizing unplanned shutdowns.

Critical process variable trends to observe include converter performance management through pressure drop and temperature profiling, catalyst condition assessment and optimization, and systematic troubleshooting of gas-phase and acid-phase contamination. We will also address using practical field tools (such as pressure surveys, dew point measurement, and stick testing) to monitor factors like drying efficiency, mist eliminator behavior, acid carryover, and drainage which impact acid tower performance.

Structured technical services — including inspections during operation and shutdowns, predictive and preventive maintenance, operator training, and on-site guidance — are essential for emissions control and ensuring equipment longevity and reliability. This combined operational and troubleshooting approach helps maintain high uptime, minimize unplanned downtime, and ensure safe, compliant sulfuric acid plant operations over long campaigns.

2026 AIChE Conference – Chemetics Presentation Abstract

Abstract: Details Matter – Materials Analysis

When designing sulfuric acid plant equipment, proper material selection is one of the most important factors that will impact success or failure. Knowledge of available material options and their properties is paramount. Often multiple options exist at various price-points. This presentation explores common and recently developed material options, their properties, and the cost considerations.