

## **INTERDISCIPLINARY PROBLEM SOLVING FOR HYDROMETALLURGY**

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### **ABSTRACT**

Hydrometallurgy encompasses a unique set of engineering and scientific disciplines, the understanding of each of which is crucial to plant design and operation. Universities currently support the specialization of students by grouping disciplines under individual courses of study (chemical, mechanical, electrical engineering, etc.). However, the persistent problems faced by the hydrometallurgy industry are not neatly discretised into just one discipline or another. In particular, multiple disciplines will need to be understood and applied together to solve complex autoclave problems.

Organizational silos further complicate interdisciplinary problem-solving by placing barriers between personnel from different internal departments, decision makers, and external subject matter experts. Effective solutions will often require going over silo walls to incentivise problem solving, obtain and analyse operating data, model the interaction of physical systems, change operating parameters, and make equipment changes. Personnel from different on-site departments are often so busy addressing emergency issues, that they do not have time to step back and consider problems from an interdisciplinary perspective. The inter-organizational impetus for this type of high-level problem solving will often require a champion or change agent within the organization.

Third parties can also be prone to one-dimensional problem solving. Equipment suppliers will tend to suggest equipment changes or upgrades as solutions, software suppliers will tend to suggest software solutions, etc. Engineers tend to rely on their intuition and solve problems inside their technical comfort zone. The industry needs impartial third parties with the ability to apply multiple scientific disciplines (e.g., control theory, mathematical modelling, and materials science).

Herein, the authors introduce examples of selected widespread autoclave issues along with corresponding interdisciplinary solutions. Further, suggestions are included about how to facilitate crossing organizational silo boundaries to achieve lasting solutions for costly recurring autoclave issues.

*Keywords:*

Autoclave Letdown, Interdisciplinary Problem Solving, Organizational Silos, Recurring Issues