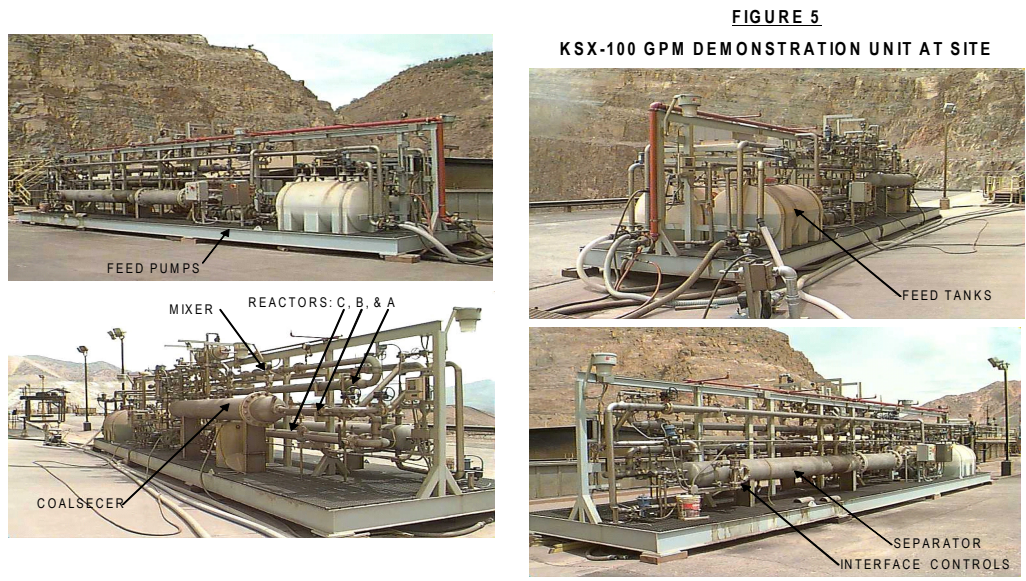


WHAT'S HAPPENING IN SX TECHNOLOGY

Delegates at the recent ALTA 2003 Conference were exposed to many of the latest trends in solvent extraction technology, through a variety of presentations in the nickel/cobalt, copper and SX/IX segments of the week long program.

One of the highlights was the presentation of the novel “plant in a pipe” SX concept in a paper from Koch and Phelps Dodge from the USA. In this system, the conventional mixer-settler is replaced by a static mixer and a separate pipe settler. Potential advantages include significant savings in capital cost and organic inventory, reduced entrainment levels, diminished fire risk and ease of relocation. A 100 USGPM demonstration plant is in operation alongside conventional units at Phelps Dodge’s Morenci copper SX facility in Arizona, and is showing promising results. The search for a cheaper, more compact, SX contactor design has been on for a long while. The “plant in a pipe” could be an answer.



Koch Otto-York : Plant-in-a-Pipe SX Demonstration Plant Arizona

Bateman Solvent Extraction said that while mixer-settlers are preferred for copper production, pulsed columns are beginning to make inroads into cobalt, nickel and zinc applications. For example, pulsed columns will be used for Inco’s Goro lateritic nickel project in New Caledonia after proving to be superior to mixer-settlers in the demonstration plant. Some zinc projects are also seriously considering pulsed columns, especially in cold weather conditions, and they are clearly favoured for uranium extraction such as Olympic Dam, South Australia. Superior fire safety is an important consideration. The development of the process criteria for the uranium pulsed column plant expansion at Olympic dam was presented by Sinclair Knight Merz and WMC Olympic Dam Operations. Expansion projects for existing conventional SX plants provide favourable conditions for the evaluation and

application of pulsed columns due to the availability of real solutions for pilot testing. The Olympic Dam copper and uranium SX facilities were also described in a WMC/Cognis paper updating the overall Hydrometallurgical Operations.

In their comprehensive update paper of the Bulong PAL plant near Kalgoorlie, Bulong Operations described how the introduction of an anti-scalent to the SX circuit which has proved to be an effective and low capital cost solution to the severe gypsum scaling problem, described at the ALTA 2001 conference as the "Final Hurdle." Scale formation and frequency of cleaning have been significantly reduced, and the average SX flow rate increased which has improved the washing efficiency in the CCD circuit (SX raffinate being recycled as wash solution). Bulong believe that direct SX (as opposed to an intermediate mixed precipitate flowsheet) has a role to play in future nickel and cobalt plants. Further enhancements and refinements identified by Bulong and others need to be explored and developed. It is interesting to note that Inco have adopted a new direct SX process for Goro.

Cognis and CEMIN from Chile presented the advantages of a special series-parallel SX arrangement over conventional series-parallel from experience at the Dos Amigos copper operation in Chile. This new process concept increased copper recovery by several percent. They also evaluated a triple parallel flow extraction circuit for treating more dilute solutions. A new Cognis reagent, LIX 9790N, was successfully piloted and adopted for the commercial plant make-up. It offers advantages of increased stability, improved net copper transfer in organic and excellent strip characteristics. Designing SX circuits with flexibility to change the piping to achieve various configurations to suit the volume and copper tenor of leach solutions was also emphasised in a presentation by Straits Resources and Cognis of which documented how the Girilambone copper SX operating parameters were managed to counter varying leach solution conditions throughout the life of the GCC operation in NSW.

In their paper on electrostatic hazards in SX plants, Shell said that this issue is in many respects the least understood electrical hazard. It does not require cables and there are no terminals or switches, so that there is often no indication of its presence. An action list was recommended which included a Risk Assessment Audit. Shell said that by managing the risk a safe operation can be achieved with little or no risk to employees or the company. The paper was timely given the two fires experienced at the Olympic Dam SX facilities.

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