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Salt Solution Mining – A Case History

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SALT SOLUTION MINING – A CASE HISTORY

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Abstract

Braskem S.A is the largest petrochemical company in Latin America, comprising a salt solution mining and a Chlor Alkali plant located in Brazil, in the city of Maceió. The yearly production capacity is superior to 800 thousand tons of salt. The solution mining process is performed by 2 sets of pumps, each with 600 HP, located in the pumping station, injecting up to 400 m³/h (1,760 gpm) of water into 10 brine producing wells. The produced brine returns to the pumping station from where it is sent via an 8-km (5-mile) pipeline to the Chlor Alkali unit, using a 540 HP pump. 1,650 KW of electrical energy are required during all the solution mining process.

This paper describes current work aimed at reducing the consumption of electrical energy in the solution mining process, taking advantage of the viscous-elastic plastic properties of salt (halite). The technique is based in pressuring the salt cavities with water and later on utilizing the stored energy in the form of pressure in the salt cavities in order to transfer the brine to the Chlor Alkali unit without pumping assistance.

These changes allowed to by pass the 540 HP pump, which was responsible for the transfer of brine to the Chlor Alkali unit, and to free flow during peak hours, reducing the consumption of electrical energy per ton of extracted salt by 36.8%, as well as reducing the peak time energy demand (05:30 PM to 08:30 PM) from 1,650 Kw to 1,250 Kw, totaling savings of US\$ 115,000/year. Ongoing optimization of free flow during peak hours indicates additional savings are possible.

In addition to the cost reduction, there is also a more uniform brine supply operation since the brine supply to the Chlor Alkali unit is guaranteed for several hours even during power outages.