

Triple Intercell Bar for Electrometallurgical Processes: A Design to Increase PV Energy Utilization

Authors : Eduardo P. Wiechmann, Jorge A. Henríquez, Pablo E. Aqueveque, Luis G. Muñoz

Abstract : PV energy prices are declining rapidly. To take advantage of the benefits of those prices and lower the carbon footprint, operational practices must be modified. Undoubtedly, it challenges the electrowinning practice to operate at constant current throughout the day. This work presents a technology that contributes in providing modulation capacity to the electrode current distribution system. This is to raise the day time dc current and lower it at night. The system is a triple intercell bar that operates in current-source mode. The design is a capping board free dogbone type of bar that ensures an operation free of short circuits, hot swapability repairs and improved current balance. This current-source system eliminates the resetting currents circulating in equipotential bars. Twin auxiliary connectors are added to the main connectors providing secure current paths to bypass faulty or impaired contacts. All system conductive elements are positioned over a baseboard offering a large heat sink area to the ventilation of a facility. The system works with lower temperature than a conventional busbar. Of these attributes, the cathode current balance property stands out and is paramount for day/night modulation and the use of photovoltaic energy. A design based on a 3D finite element method model predicting electric and thermal performance under various industrial scenarios is presented. Preliminary results obtained in an electrowinning facility with industrial prototypes are included.

Keywords : electrowinning, intercell bars, PV energy, current modulation

Conference Title : ICHBR 2018 : International Conference on Hydrometallurgy and Biomining Research

Conference Location : Toronto, Canada

Conference Dates : June 21-22, 2018