

Modelling and Engineering Experience of EGA in Brown Field Modernisation of Aluminium Smelters

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Abstract

EGA has developed extensive experience in the continuous improvement of existing cell designs over the past 30 years. Earlier improvements were empirical and evolutionary, but with the introduction of mathematical modelling more significant and rapid retrofitting of old technologies became feasible. This paper describes EGA's approaches and experience in the development of improved designs for existing cells like D18+ Technology, based on thermo-electrical, mechanical and magnetohydrodynamics (MHD) modelling, as well as the engineering work and challenges which were encountered during the design and implementation stages of these cell technologies. The results of plant modernization will also be shown.

Keywords: Aluminium electrolysis cell modelling; cell design; smelter retrofit engineering; ANSYS.