

IT ALL BOILS DOWN TO CUBIC FOR BOYNE SMELTER

Introduction

As Australia's largest aluminium smelter, Boyne Smelters Limited (BSL) has the capacity to produce more than half a million tonnes of aluminium annually, and recently undertook an upgrade to both modernise and extend the life of this grand scale operation.

Located near Gladstone in Central Queensland, production activities at BSL include the manufacturing of carbon anodes, aluminium production (smelting) in reduction lines, and casting of molten metal into aluminium products. Undergoing a number of extensive expansion projects since it first commenced operation in 1982, the company recently embarked on another significant technology modernisation involving the construction of a fourth Carbon Baking Furnace – Carbon Baking Furnace Four.

Project Overview

Initiating this project, Rio Tinto, as major shareholders of the BSL joint venture, released a contract to design the furnace which once completed was to be more energy efficient whilst also reducing on-site greenhouse gas emissions. Within this contract it was specified that the design of the Carbon Baking Furnace was to include low voltage (415V) switchboards that had a fault rating of 80KA and had been tested in Australia for full arc fault containment compliant to AS1210 annex ZD.

Following a detailed submission process that included a number of proposed designs, many of which were unable to fulfil the criteria of the standard, Sinclair Knight Merz (SKM) in conjunction with SNC Lavalin – together as an Engineer Procure and Construction Management (EPCM) Project, put forward a modular design using the CUBIC range from NHP.

In line with BSL's focus on delivering a sustainable operation that ensures minimal impact on the environment as well as health and safety of employees, the EPCM Project designed board was able to adhere to this, drawing upon a number of components from the NHP product range.

The Solution

The LV Switchboards were procured based on BSL approved specification for LV switchboards and the CUBIC product was evaluated by the EPCM Project as being the most technically compliant with the specifications from the bids received. Utilising the CUBIC MD System (multi drawer) as an integral element to the original design, the Project was able to offer high levels of safety for operators, positive isolation with the removal capability of the drawers, as well as lock out and test features of the cells.

"Adding to the strength of our design, an installed arc-detect system was an additional safety feature and with the further advantage of installation of the boards into locally manufactured switchrooms, ease and speed of on-site construction was assured which was a valuable plus for the customer", said the Senior Executive Electrical Engineer from SKM.

Working with PT Automation Solutions (PTAS) who detail designed the switchboard, NHP, as well as the CUBIC MD System that featured in the complete prefabricated 26m long switchboard, also provided the project with all of the low voltage protection and isolation devices, motor starters, variable speed drives, as well as distribution boards and DeviceNet Modules communicating to a ControlLogix PLC platform.

"Having worked with NHP on a number of other projects prior to this one with BSL, including Gladstone Ports, Hinze Dam, All Connex Water and SeaWorld, we knew the working relationship NHP is one that we can rely on", said Neil Cook, Electrical Engineering Manager from PTAS.

"NHP were, and continue to be very helpful and supportive of PTAS on many projects and it's that kind of post-sale support that makes the difference", he continued.

Resulting from the success of the initial Carbon Bake Furnace contract, PTAS also manufactured the Fume Treatment Centre MCC based on the same specification used for the Carbon Bake Furnace Four.

Project Fact File

Project: Boyne Smelters Limited (BSL)

Location: Gladstone, Queensland

Details: The company recently embarked on another significant technology modernisation involving the construction of a fourth Carbon Baking Furnace.

NHP Products/Services:

- CUBIC MD System (multi drawer)
- Low voltage protection and isolation devices
- Motor starters
- Variable speed drives
- ControlLogix® PLC
- DeviceNet Communication Modules

