Increasing casthouse production at Alcoa Deschambault

With the aluminium industry continuing to face many challenges, producers are looking for economical ways to improve their operations, and Alcoa is no exception says Martin Champoux. Custom designed equipment supplier Dynamic Concept was tasked with finding just such a solution.

The Alcoa Deschambault Smelter’s casthouse in Canada has a stated objective of increasing its production capacity by about 15 per cent without adding a new casting line to its existing two. Dynamic Concept was asked to look at this objective and evaluate if it could be achieved by modifying the existing casting lines.

Two choices

The project began at Deschambault, with the first step consisting of analysing the options available, which was done by Dynamic Concept in collaboration with Hatch consulting and engineering services. At the end of that process two potential solutions were identified:

1. Increase from 14 to 16 the number of moulds per table while keeping moulds’ of the same type and dimensions (12 in x 34 in)

2. Keep the same number of moulds per table but increase their size to meet the production capacity objective.

The analysis covered all aspects that might be impacted by the changes that were being considered. These included the emergency shutdown delay available in case of water supply disruption, the potential modifications needed to sawing equipment and the lubrication system.

After a thorough evaluation, both options showed similar cost and were deemed technically feasible. A complete report was produced, which underlined the findings and main conclusions. After consideration and balancing the advantages and disadvantages of each option, Alcoa Deschambault chose to keep the same mould dimensions and to increase the number of moulds on the casting table. One significant advantage of that option is that no training of employees or operational adjustments to the existing equipment, such as the sawing system, would be needed.

Design and implementation

Following the decision by Alcoa to go ahead with the densification of the casting table, Dynamic Concept moved the project into the next stage. This involved on-site collection of data and measurements, conception and design, and detailed engineering work. This was followed by manufacturing, assembling and dry testing. Note that the new table design was also done to support larger moulds for an additional capacity increase in the future.

New collaborations

Located in the Province of Quebec, Canada, Dynamic Concept is a recognised leader in the supply of custom designed equipment and processes for the aluminium casting industry. With its team of highly qualified aluminium specialists, Dynamic Concept is able to offer tailor made solutions and equipment to meet the manufacturing requirements and overall production objectives of its clients. Depending on the need, Dynamic Concept can assist its client in all steps of a project, from the early stages of option analysis and preliminary engineering up to the full turnkey approach, including equipment supply, testing, commissioning and start-up. Equipment is designed to adapt, fit and upgrade existing production assets.

Dynamic Concept has recently entered into an agreement with MQP Ltd for the UK based company to represent it in Europe. Dynamic Concept and MQP see this collaboration as an ideal means to bring novel expertise, such as involved in the successful casthouse project described here, to European casthouses. For the same purpose, but for the Brazilian market, Dynamic Concept has recently signed a representation agreement with DJ Fornos Industriais in São Paulo, Brazil.

Acknowledgement

The authors would like to thank Alcoa for permission to use the information describing the work carried out at the Deschambault casthouse and installed by a Dynamic Concept team of experts.

The commissioning programme went smoothly from the first cast, a testament to the quality of the work done by all involved in the project. It is worth pointing out that the Deschambault Smelter now has a casthouse capable of vertically casting 16 T-Bar ingots per cast. Alcoa has already added a second densified table and expects to add a third one. This will allow more flexibility to its operations, particularly with regard to the goal of increasing the number of alloys produced at the site.

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