Shell Heat Exchanger Technology

Client: TRIMET Aluminium AG

Location: Essen, Germany

The Project

Use LMRC's Shell Heat Exchanger Technology to open the operating amperage window for a reduction cell. This allows the smelter to move from the standard steady state operation to a dynamic operation that can be changed readily in relation to variables such as power and metal price. Benefits include:

1. Smelter can reduce or increase amperage at will to increase smelter profitability in all market conditions.
2. Use the smelter as a "virtual battery" by releasing power back to the grid when there is a shortage and increase production and power consumption when there is an oversupply of power. This is particularly important in areas with high dependence on renewable energy.

LMRC's Role

1. Patent holder of the Shell Heat Exchanger Technology.
2. Work with client and licenced technology supplier to design a fully customized SHE system which provides target functionality without compromising normal operations and safety.
3. Work with and advise smelter and equipment suppliers during procurement, installation and commissioning processes.
4. Define the full system capability and benefit through use of vigorous testing regimes.
5. Provide training programs to smelter operators on how to use and get the most of the SHE technology.
6. Continual development of value adding enhancements for the current system

Current Status and Results

1. 12 pots installed with SHE Technology at TRIMET, Essen
2. Greater control over heat balance has allowed ACD to be reduced, leading to a XXXX kWh/kgAl reduction in energy consumption at base amperage.
3. Successful increases of up to 20kA easily achieved for periods at short as 1 hour and as long as 1 week with no change to current efficiency and a XXXX kWh/kgAl improvement in energy consumption.
4. Large amperage decrease demonstrations to be completed by end of 2014.

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