fast payback on its investment. Working with GE, DUBAL implemented numerous upgrades. In 2008, DUBAL ordered an upgrade of its five Frame 9B turbines and another upgrade in 2009 for three of its Frame 5 turbines. An ongoing services agreement also ensured DUBAL had the on-call expertise of GE at hand, with the company supplying parts, performance upgrades, repairs and field services for planned outages of the gas turbines for seven years.

**Return on investment**

Through these upgrades DUBAL saved enough on its electricity expenses to recover its project costs within three years.

GE’s Industrial Power Management platform improves the power system reliability and productivity of the smelter, allowing DUBAL to scan data quickly, on a time-synchronised platform, for extensive analysis and real-time decision-making. As a result, DUBAL can increase supply reliability by monitoring its critical loads and ensuring the security of its power system through dynamic fast load-shedding.

By choosing the most economical power source to meet its forecast load, while taking into account a variety of constraint variables, DUBAL can also decrease fuel costs. Substations can be monitored and controlled remotely to enhance productivity and reliability — and to handle any emergency conditions or unscheduled events most efficiently. This also enables easier distribution of surpluses or deficits across the system, which capitalises on new business opportunities for power trading in an open access system.

Overall, the results achieved to date include (achieved values, new condition):

- Achieving a 22.69 per unit per cent increase in output by upgrading five GE 9B gas turbines. This added 75 million watts to existing capability, sufficient to power over 60,000 homes.
- Realising a -0.44 per cent improvement on heat rate, thus saving the company US$4 million in fuel cost savings annually.
- Efficiently managing more than 2,300 MW, enough to power 1.8 million homes.
- Maintaining above 96.5 per cent system availability.
- Decreasing fuel costs by choosing the most economical power source to meet its forecast load while taking into account a variety of constraint variables.
- Improving the power system reliability and productivity of the smelter.
- Monitoring and controlling power substations remotely to enhance productivity and reliability — and handling any emergency conditions or unscheduled events most efficiently.

Collaboration was the key to success in this partnership. Working cooperatively, our companies accomplished the goal of maintaining DUBAL’s quality standards and level of production and generation capacity, while cutting costs. GE improved the power system reliability and productivity of DUBAL’s smelters while decreasing fuel costs, reducing nitrogen oxide emissions and saving on its electricity expenses.

**Reader Reply No.164**

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**Enhancements to Moduloc digital laser sensor technology**

MQP have a worldwide agreement with Moduloc Control Systems to market and distribute their digital laser metal level control systems to the aluminium casthouse industry. This article reviews the range of equipment available from Moduloc, and highlights two important enhancements recently made to the units at the heart of the systems, namely:

- Digital laser camera sensors which measure molten metal level, and
- Pin and the gate valve actuators which control the molten metal pour.

Both of these enhancements have been designed and incorporated into the equipment by Rolf Backenburg of Moduloc based on his accomplished and long involvement in this specialised technology. The schematic shows how an integrated system of Moduloc Laser Level Sensors, together with Actuators connected to a control pc, can provide complete control of molten metal level in a typical casthouse layout.

**Camera sensors**

Moduloc Digital Laser Level Sensors are compact units with integrated optics and a signal processor for precise measurement of the liquid level to +/- 0.1 mm. A focused laser spot is illuminated on the molten metal surface and the image distance determined by an internal CCD Camera.

The newly enhanced feature of this high resolution laser and camera system is that it enables a much narrower trigonometric angulation angle to be used. This means that the camera and laser can be mounted together in a very compact housing (180 x 164 x 62 mm) positioned well above the molten metal surface. The housing is equipped with a protective nozzle and baffling, with a vortex air cooling option, to provide protection from steam and dust in the operating environment. Camera replacement can be easily achieved without disturbing the mounting configuration.

Another feature of the sensor is enhanced software with an auto gain circuit which brightens the laser and opens the camera aperture when heavy fumes are present at the start of pour, where control function is critical. Installation software is provided for precise measurement of the liquid level to +/- 0.1 mm. A focused laser spot is illuminated on the molten metal surface and the image distance determined by an internal CCD Camera.

Camera sensors are now available to provide the user with improved control. Pin actuators have newly incorporated DC motor drives and 4-20 ma position feedback, providing smooth continuous movement. Emergency closing function is provided by an external relay operation of the DC motor. Gate valve actuators now have twin telescopic towers each with an air cooled DC motor drive providing smooth operation.

**Reader Reply No.165**

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The aluminium casthouse industry, like all industries handling molten metal, requires reliable, precise level control on the launderers, troughs and head boxes in use throughout the typical casting plant. Moduloc Level Sensors incorporate digital outputs which verify level measurement is being transmitted and the internal temperature is within specified limits. Complete Moduloc systems can be customised to suit billet or slab casting layouts and supplied with the latest enhanced sensors and actuators as described above.

**Reader Reply No.166**

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