

# **Modelling of Frequency Disturbances of a Small Isolated Electric Power System**

*C. Sharma*

## **Abstract**

The operation of two 90-tonne electric arc furnaces was monitored using a personal computer-based data acquisition system. Several operational step changes in arc furnace operations were performed. The effects of these operational changes were reflected onto the power system as power system frequency changes. The instantaneous voltages and currents to the two furnaces were logged using the data acquisition system. From the logged data, the resultant changes in system power flow and the subsequent power frequency deviations were extracted. This was done for several modes of operation of the electric arc furnace. The system was then modelled using IEEE format and the theoretical reaction of the power system obtained. The results gave conclusive physical evidence of the effects of the operation of the electric arc furnace on an isolated power system grid. It also showed that the model could accurately predict the effect of load changes on the power system.