## ABSTRACT

In this report the reinforcement of a relatively small power system to accommodate five 40 mega-watt electric arc furnaces is investigated. In choosing a system configuration, for the integration of the furnace loads into the existing system, the determining factor used is the flexibility of the configuration with regards to future expansion. New fault levels are determined for the modified system. These are compared with the megavolt-ampere ratings of switchgears on the existing system. The effect of the system loads on fault levels is also discussed. Results are presented which show that the modified system is stable for a three-phase fault (cleared after 0.1 sec.), on the bus supplying the furnace loads. In addition, the effect of the violently fluctuating furnace loads (with and without var compensation) on the frequency and voltages throughout the system is investigated.

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