

ABSTRACT**The Effects of Impulse Loadings****on a****Medium Size Grid****CHANDRABHAN SHARMA**

In order to be able to predict the effects of the operation of the local Steelworks on the Electric Utility, it is necessary to have a reliable model of the electrical systems of both the Steelworks and the Electric Utility. With this as the focus, an accurate, up-to date model of the Steelworks and the Electric Utility has been developed.

Models for all the turbine/generator sets at the Electric Utility have been developed based on the IEEE published models and models obtained for the equipment vendors. Actual field measurements of the major transmission links between the Steelworks and the Electric Utility were performed.

With this model, the theoretical reactions of the power system to various modes of operation at the Steelworks were studied on the digital computer.

In order to compare the outputs from the developed

model with the actual reaction of the power system, a novel data acquisition system was developed. The data acquisition system is based on a personal computer and a special data acquisition card. A complete software suite for logging, analysing and displaying of the acquired data was also developed. The data acquisition system was then hooked up to the 132kV incoming lines to the Steelworks and actual data for various modes of operation were logged.

The logged data were then compared with the theoretical outputs from the developed model for the system. They were found to be in close agreement. It was concluded that the developed model can accurately predict the reaction of the power system due to power swings. Also using the developed data acquisition system, the actual reaction of the power system to power swings may be accurately and easily measured. Recommendations have been given for the refining of the developed model.