

## ABSTRACT

Investigation Of The Flicker Effects and Dynamic Responses Of The Power System For Electric Arc Furnace Operation At 105 MVA, With Emphasis On Generation-Load Dynamics

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The Electric Arc Furnace (EAF) at Caribbean Ispat Limited is a significant load on the power system. Over the years the Arc Furnaces have been subject to numerous upgrades and modernization effectively increasing annual steel production. The latest proposal requires that Electric Arc Furnace #1 operate at 105 MVA, 25 MVA above its present operating power (80MVA).

This study analyses the dynamic responses of the existing and proposed system using The PSS/E Software (developed by PTI) for EAF operation at 80 MVA and 105 MVA. The analyses are based on power system theory and standard system study practices, emphasis being placed on the arrival of accurate models. The Flicker level is also investigated by simulations using PSS/E and measurements using a FLUKE Scopemeter. A basic financial analysis is performed on each of the proposed solution.

Finally, the results of the technical and financial analyses are used to select one of the proposed solutions for implementation.

**Keywords:** Ronald Rackal; Electric Arc Furnace; EAF; Power system stability; Flicker.