

769 – Sympathetic Inrush Study Case

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Abstract: Sympathetic Inrush is the transient current which is drawn by an already energized transformer while another transformer is being energized and connected in parallel. Depending on the severity of this phenomenon, these currents may have many adverse effects, like false triggering of protection elements, electrical and mechanical stressing to equipment and generally demotion to the network power quality.

The magnitude and the duration of this currents are mainly related to the involved transformers electromagnetic and mechanical characteristics (residual flux, core air reactance, transformer geometry, etc), the network source impedance, the load conditions, the breaker point of wave switching, the breaker pole closing synchronization (important for single pole breaker operation) and finally the network configuration.

This paper summarizes the analysis using PSCAD/EMTDC software platform to have:

- The effects of specific network condition on the sympathetic inrush.
- The voltage sag on the 13.8kV Electrical Submersible Pumps (ESPs) associated with this sympathetic inrush.
- Validation of the simulation with actual recording from the field.