

PRE-MAGNETIZATION SYSTEM

AKA Transformer Pre-magnetization System

The connection of transformers to AC buses in marine power plants can result in inrush currents several times greater than the steady state full load current. Often this can cause a disturbance on the AC bus, in the form of a voltage drop. To combat this, additional generators may be brought online prior to transformer connection. However, the total number of generators is then higher than would normally be required to run the plant under steady state conditions, and in a blackout recovery situation this means additional time is required for recovery. In some situations – for example where generators are out of service for maintenance – recovery may be impossible. It is sometimes necessary to set generator protection parameters (eg. differential trip settings) wider than the ideal in order to allow for transformer connections. These inrush currents over time can stress and eventually damage a transformer. For these reasons, a method of inrush

limitation can be essential for marine power plants.

A method of pre-magnetizing large transformers has been successfully applied on several vessels in recent years. This system involves initially energizing the secondary windings of the transformer prior to connection of the primary to the main bus. This has the effect of pre-magnetizing the transformer's core and aligning magnetic fields so that inrush is negligible when the primary feeder breaker is closed.

**AKA's
Pre-Mag
System**
Protect your
transformers from
inrush currents.

Major components of the system include

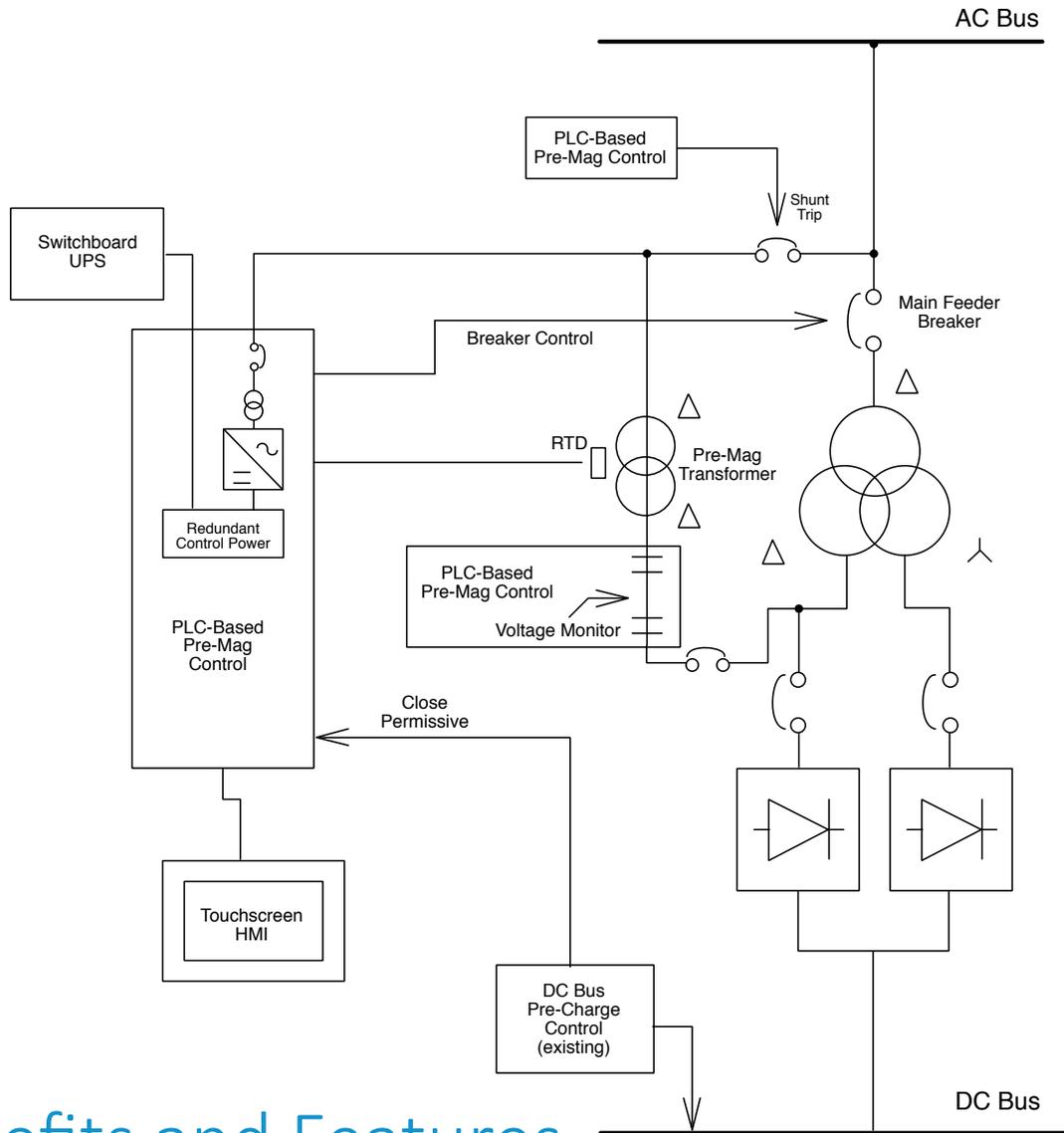
- PLC Control Box
- HMI Touch screen
- 10kva Pre-mag Transformer
- RTD temperature monitoring



ENGINEERING INNOVATIVE SOLUTIONS

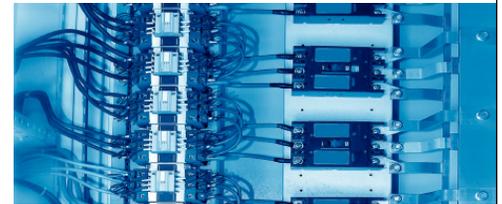
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PRE-MAG SYSTEM



Benefits and Features

- Inrush current is negligible
- Fewer generators required to compensate for voltage drop
- Faster blackout recovery times
- Hardware-In-The-Loop Testing using dual series contactors to allow the system to test some key functionality without actually performing a complete pre-mag operation.
- Twin control power feeds independently monitored and alarmed
- UPS back up feed to maintain PLC in ready state during blackout
- HMI Touch screen to display the status of system elements and monitored values (such as voltages and temperatures) and alarms.
- PLC control box to supervise and sequence the pre-magnetization (pre-mag) process and to monitor the health of all sub systems involved



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