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Case Study

Digital Front-End Retrofits for GE EX2000 and LCI on GE 7FA Turbines

Most of the early-era digital control devices are no longer available, leaving equipment owners hoping they have no failures. In this case study, the customer needed to retrofit a GE EX2000 and LCI on their GE 7FA Turbine.

The EX2000 was one of the earliest digital static excitation systems. Both the EX2000 as well as the Load-Commutated Inverter (LCI) were early market products in the load-commutated inverter static start field.

Due to the obsolescence of the hardware components, especially processors, the customer had to find a cost effective, reliable solution.

Scope

- Retrofit an aging EX2000 static excitation system with the DECS-2100 Digital Excitation Control System as a front-end retrofit solution.
- Replace the EX2000 controller with Basler's ECM-2 Excitation Control Module.

Design and Solution

A digital front-end (DFE) replacement is a less expensive alternative to a total replacement in both the EX2000 and Innovation/LS2100 LCI starter. A DFE replaces control modules containing system logic, transducers, I/O modules, alarming, limiters, power system stabilizer if needed, internal protection if desired, control room communication, human machine interface (HMI), and firing modules.

Working in close partnership with Turbine Controls & Engineering Group (TC&E) as the authorized installation and service provider, Basler was able to design a system that worked seamlessly with the LCI retrofit provided by Toshiba Mitsubishi-Electric Industrial Systems Corporation (TMEIC). The main control boards were configured specifically for the LCI starter application and the interface boards were custom designed to properly connect the TM-LCI-DFE controls to the existing gating system.

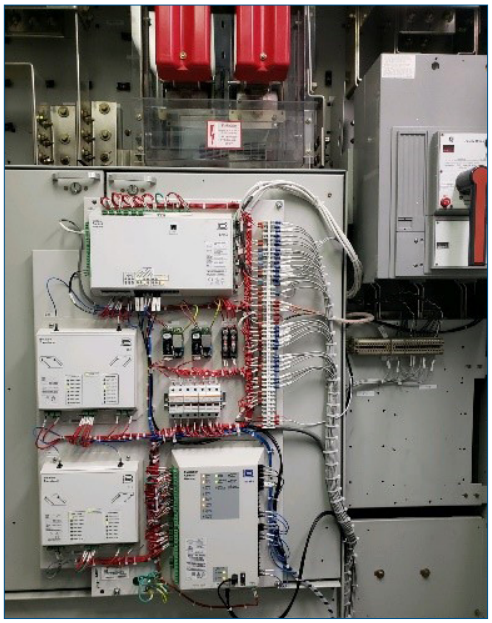

Figure 1 - Updated EX2000 with Panels for the DECS-2100

Wrap Up

Retrofitting the EX2000 with Basler Electric's ECM-2 digital front end guarantees increased life of existing bridges, as well as increased control and operation of the overall system.

The new Basler panels have all the components for the excitation DFE, including the controller, prewired with the interface terminal blocks necessary to accommodate the space available within the existing cubicle.

Basler has also done multiple digital front-end upgrades to GE EX2000 exciters when there is no LCI present. Those DFEs can be single core and single bridge as well as dual core and dual bridge.

Basler has a long tradition of supporting products as long as manufacturing components are available, and currently supports excitation systems built in the 1970s and earlier.

More information about the DFE in these applications may be found in a Basler Application Note. Ask your Basler representative for document EX-DFE.