December 2024

Case Study

Full Static Exciter Replacement of Obsolete ABB System

Most of the early-era digital control devices are no longer available or have very limited parts availability, including the ABB Unitrol F, leaving equipment owners hoping they have no failures. In this case study, the customer decided to retrofit a complete static exciter.

The Unitrol F was one of the earlier models from ABB's line of digital static excitation systems. Various parts have been obsoleted, and partial controller front-end retrofits (if available) may not solve all parts obsolescence issues (breakers, firing modules, rectifiers, contactors, relays, etc.). Reduced functionality may also limit safer and more efficient system operations.

Scope

- Retrofit an aging Unitrol F static excitation system with a complete new DECS-450 Digital Excitation Control System
- Simplify site work and installation as much as possible, utilizing a custom-designed system from Basler Electric

Design and Solution

Basler Services designed a full engineering package with site supervision, handling the project from start to finish, including:

- Initial site visit to verify information (functionality, dimensions, connection points, transportation limitations, etc.)
- Specified equipment for purchase (single PO through Basler Services to manage the project)
- Review of Basler OEM equipment as-built drawings (customized to the plant layout)
- Creation of custom plant-level integration drawings for use in the installation/integration of equipment
- Demo/Installation of equipment utilized plant/local labor forces as requested by the customer
- Pre-commissioning wire check/verification (supervision)
- Commissioning/validation studies as needed

Basler Electric was able to take gathered site information to produce custom cabinets meeting the cable entry points of power connections. This allows re-use of wiring, saving both time and money from on-site work, and keeping the footprint constraints within the existing concrete pad, reducing construction modifications prior to installation.

Unitrol F static excitation system (before)

New DECS-450 System (after)

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Unitrol F breaker (left); vs new breaker (right) matching cabled entry points

DC cable (aux section for cables in dark area) vs new DC bus stabs and cabling (improved visibility)

A Note on Basler Product Lifecycles

Basler-manufactured systems and controllers are designed with backwards compatibility in mind, many controller updates do not require replacement of anything other than the controller and field isolation module. Now into our 3rd generation of DECS digital controllers for static excitation systems (DECS-300, DECS-400, DECS-450), prior units were in each in normal production for 15–20 years, followed by the continued ability to repair units so long as parts remain available. Many of our earlier analog control systems (known as the SSE Shunt Static Exciters) remain in operation after more than 30 years, and Basler still reviews these systems for spare parts requests to advise spare availability or upgrade paths.

Wrap Up

Upgrading the Unitrol F with Basler Electric's complete new DECS-450 Static Excitation System provides a high degree of availability with reduced risk of unplanned outages from aging equipment, as well as increased control and operation of the overall system.

Additionally, some projects where only in-house resources are used to try and integrate systems can result in lack of coordination to update plant level drawings (personnel making changes on the fly during installation/startup). Basler Services includes these Engineering Design Packages (or EDPs) in the scope as a clear deliverable. Utilizing an engineering services firm like Basler Services helps remove the unknowns and reduces the risk of trying to self-execute projects on budget/on time. This ensures future reliability of operations for years to come.