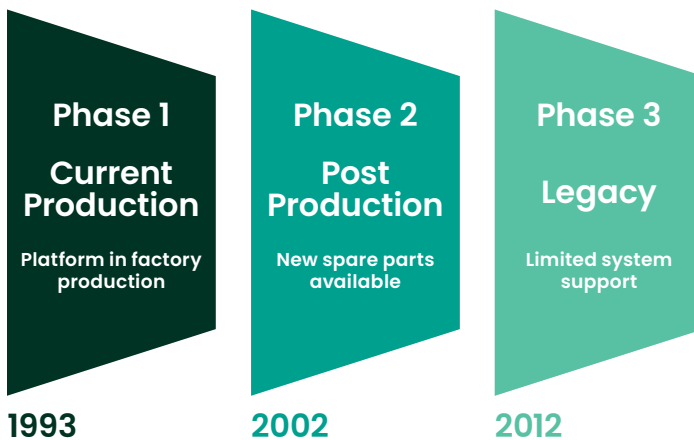


EX2000 Life Extension

A comprehensive set of maintenance and modernization options to manage the life cycle of the GE EX2000 static excitation system.

Introduced in 1993 and produced until 2002, the EX2000 family of automatic voltage regulators and excitation systems continue to serve a wide variety of turbine-generator applications.

EX2000 life cycle status



The EX2000 officially entered Phase 3 "Legacy" status in 2012.

An expanding modernization portfolio

The EX2000 J-frame and L-frame static excitation system (~1200A – 8000A dc) share a common power converter design and operate on hundreds of large steam, hydro and heavy-duty gas turbine-generators. The compact system footprint and reliable architecture can now be modernized over time and as budget and operating reliability requirements demand.

New power converter refurbishment products, blower assemblies and DC contactor assemblies are structured to provide cost effective alternatives to full system replacements. With a large percentage of the EX2000 static exciters now operating with updated controls, the modular system design provides an opportunity to selectively update other key elements of the system, continuing to extend reliable revenue services and further enhance the return on the original system.

Extending system useful life

Over the last 15 years, Nexus Controls, a Baker Hughes business (formerly GE Energy Control Solutions), has developed a variety of control migration products for the legacy GE excitation and static starter products as well as platforms of other OEM control providers. We pioneered Digital Front End (DFE) controls upgrades for the fleet of EX2000 static exciters and controls-only upgrades offer a cost-effective way to address the increased operational risk and performance limitations of digital excitation control hardware, and application and operating system software as they mature.

Updated digital controls provide a host of benefits:

- Increased system flexibility to meet new operating challenges
- Reduce staff overhead associated with evolving regulatory compliance requirements
- Reduced cybersecurity attack surface

- Improve data integration and decision support
- Ensure access to readily available spares
- Patching and software support
- Shorter outage durations
- Less intrusive, doesn't disturb AC or DC cabling



The EX2000 power electronics have proven to be highly reliable and with regular maintenance, the EX2000 power conversion train has surpassed the design intent of a 20-year service life. Fleet leaders are approaching 30 years of almost continuous operation.

Updated power conversion modules provide:

- Enhanced insulation system on SCR clamps
- New SCRs, fuses and capacitors to restore original operating characteristics and performance and protection
- Complete inspection and retorque of bus and mechanical connections
- Reset the clock on wear driven by thermal cycling driven by operational changes
- Replace worn cooling blower assemblies and motors

The Nexus Controls team can work with you to lay out a plan to manage the life cycle of your excitation system modernization, maintenance, TIL implementation and parts inventories.

Contact your local Nexus Controls Sales Representative for more information.

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| <p>Power Conversion Modules</p> | <p>Three complete phase assemblies</p> <ul style="list-style-type: none"> • Clamped SCRs and heat sinks • Snubber resistors • Snubber capacitors • Thermostatic switches • DC leg fuse assemblies • Lexan covers and baffles • Mechanical fasteners | <p>Services</p> <ul style="list-style-type: none"> • Converter module disassembly • Cleaning of mounting points and connections • Reassembly of three new, complete phase assemblies • Torque to spec • Termination of firing and instrumentation wiring • Megger test • Recommissioning of power conversion modules |
| <p>Blower Assemblies (3 hp)</p> | <p>Three complete blower assemblies</p> <ul style="list-style-type: none"> • Motors with centrifugal switches • Blower housing and wheels • Blower fuses • Terminal assembly | <p>Services</p> <ul style="list-style-type: none"> • Remove existing blower assemblies • Mount new blower assemblies • Terminate power and sensing • Functional test |