GE VERNOVA

CASE STUDY

EMERGENCY RECOVERY OF A CRITICAL SFC SYSTEM IN DEBRECEN

Power restored in just five weeks

CHALLENGE

In August 2024, a critical failure occurred at a power plant in Debrecen, Hungary, when a 25-year-old static frequency converter (SFC) unexpectedly shut down. The SFC, a vital component for starting the site's 6FA gas turbine, suffered a control system malfunction that rendered the unit inoperable. With no compatible spare parts available and the original equipment manufacturer no longer supporting the system, the plant was forced into an unplanned outage. The urgency was compounded by the fact that the outage occurred during a period of high energy demand, leaving the customer with limited options and growing operational risk.

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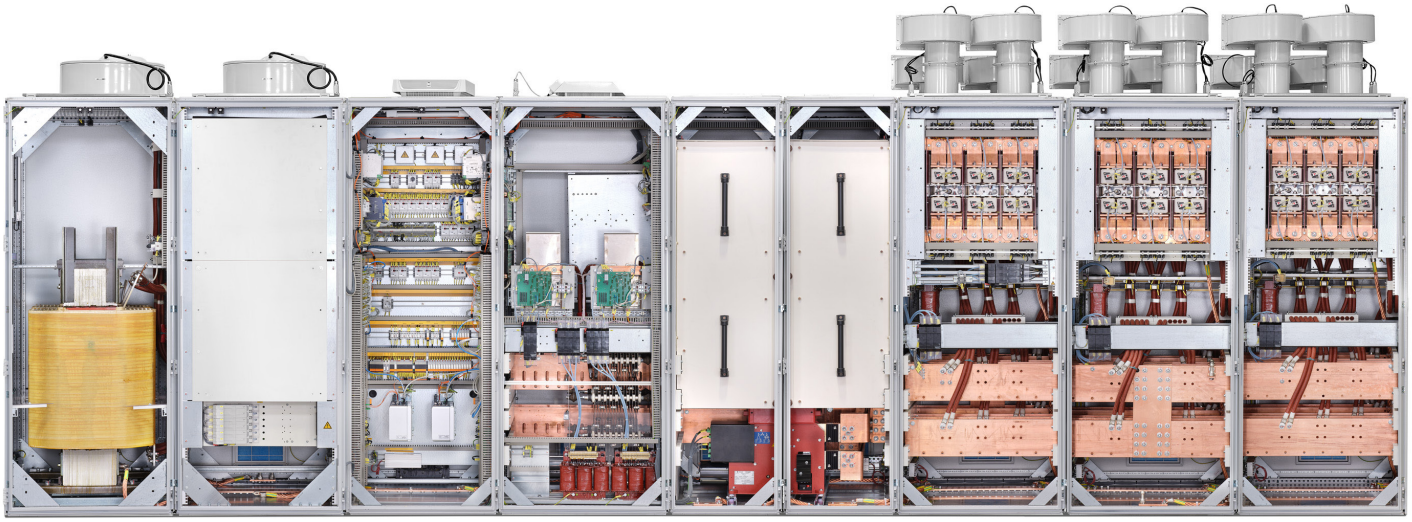

SEMIPOL™ (SEE/SFC)
is based on a modular design and can be applied for many solutions, industries, and applications.

Case

The failed SFC was an outdated third-party unit—an aging system that had reliably served the plant for decades but had reached the end of its supported lifecycle. The failure created a complex scenario: the control cards were no longer communicating with the PLC, and the system could not be restarted. The end customer, Veolia Energia Magyarország Zrt., engaged GE Vernova's Gas Power business, their long-standing technology partner, to help identify a viable path forward. Multiple suppliers were consulted, but most proposed only partial solutions or recommended a full system replacement. While technically feasible, this approach came with a lead time of at least 12 months, during which the plant would remain offline and unable to contribute to the grid.

Solution

Power Conversion & Storage, a GE Vernova business, was brought in by GE Vernova's Gas Power business to assess the situation and engineer a recovery strategy. Leveraging its SEMIPOL™ D4.2 controller platform, the team developed a tailored bypass control system that replaced the failed components and re-enabled turbine startup. The solution was designed, manufactured, and delivered in just five weeks—compressing what is typically a multi-month process into a matter of weeks.

This achievement was made possible by three critical enablers:

- **Expertise:** Power Conversion & Storage's deep knowledge of SFC systems, including third-party legacy equipment, allowed for rapid diagnostics and a precise retrofit design.
- **Manufacturing readiness:** The regional facility in Berlin maintained emergency stock and had the flexibility to produce non-standard configurations on short notice.
- **Execution agility:** Engineering and project teams were mobilized immediately, reprioritizing resources to meet the customer's urgent needs without compromising quality or safety.

The temporary SEMIPOL™ D4.2-based solution will remain in operation until the delivery and commissioning of a new, fully integrated SEMIPOL™ SFC system—planned within the next year.

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Background

SFCs—also known as soft starters or load commutated inverters (LCIs)—are essential for the controlled acceleration of gas turbines. Without a functioning SFC, the turbine cannot reach operational speed, and the plant cannot generate power. As these systems age, the risk of failure increases, particularly when spare parts become obsolete and technical support is no longer available. The Debrecen case underscores the operational vulnerability of unsupported legacy systems and highlights the importance of lifecycle planning and modernization.

Looking at the future

The customer has already committed to replacing the legacy SFC with Power Conversion & Storage's SEMIPOL™ system. This next-generation solution will be tailored to the plant's specific requirements, ensuring long-term reliability, maintainability, and performance. The collaboration between Gas Power and Power Conversion & Storage demonstrates the strength of GE Vernova's integrated capabilities—delivering both emergency recovery and full modernization solutions. With deep technical expertise, flexible manufacturing, and a customer-first approach, Power Conversion & Storage is prepared to support similar challenges across the industry, even when dealing with third-party equipment.

POWER CONVERSION & STORAGE'S ABILITY TO DELIVER A CUSTOM SFC CONTROL SOLUTION IN JUST FIVE WEEKS DEMONSTRATES THE VALUE OF EXPERTISE, MANUFACTURING READINESS, AND CUSTOMER-CENTRIC EXECUTION.

About Power Conversion & Storage, a GE Vernova business

GE Vernova's Power Conversion & Storage business combines advanced energy conversion and storage systems to meet the electrification needs of utilities and industries. With a focus on power stability, energy storage and industrial electrification solutions, Power Conversion & Storage empowers customers by addressing their most complex electrification challenges and accelerating their transition to a sustainable, decarbonized future.

Power Conversion & Storage
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