Mark* VI to Mark* VIe Control Platform Upgrade

GE is proud to provide controls you can trust such as the Mark VIe. With a Mark VI to VIe Platform Upgrade package, you can benefit from significant performance enhancements and an improved life cycle to your current control system. This upgrade brings you up-to-date with today's technology without impact to site wiring, field terminations, or turbine devices while enabling increased performance, flexibility and maintainability.

Benefits:

- Increased computing power and memory for new advanced control applications which improve turbine performance and reliability
- Modernized high-speed, redundant networks eliminating single-point failure risk
- Streamlined installation enabling total unit upgrade in as few as 5 days (with a 2–3 day outage).†
- Ability to expand I/O capacity, providing a clear path for future enhancements and extended life cycle support

†Depending on site conditions

How It's Done

Using a new PCMI gateway interface, the existing Mark VI I/O boards communicate to your new Mark VIe controller on the IONet. The Mark VI VPRO protection board is also upgraded to the new Mark VIe PPRO module. The new Mark VIe controllers, IONet switches, and power distribution are contained in an assembly that mounts into your Mark VI cabinet (in the space provided after removal of the VPRO rack). Some other existing VME boards and terminal boards may also need to be upgraded. (See table below.)

Before	After	Brief Description
VCMI	PCMI	The PCMI Control Master Interface module is the Mark VIe control system's interface to the existing Mark VI VME boards, used for the platform upgrade from an existing Mark VI control to the Mark VIe control.
UCVx	UCSB	The UCSB controller is a stand-alone, single-board controller with scalable processing power. It includes built-in power supplies and requires no batteries or jumper settings. UCSBH4A contains a 1066 MHz EP80579 Intel processor.
VPRO and TPROH1A	PPRO and TPROH1C	The Backup Turbine Protection (PPRO) I/O pack and associated terminal boards provide an independent backup overspeed protection system with a backup check for generator synchronization to a utility bus.
VSCA	PSCA	The Serial Communication PSCA I/O pack provides the electrical interface between one or two I/O Ethernet networks and a serial communications terminal board.
VAMB	PAMC	The Acoustic Monitoring Input PAMC supports combustion dynamics for heavy-duty gas turbines.

Latest Processor and Network Technology

Your existing VME-based processors are replaced with modern Mark VIe processors with substantially more computing power. These replacement boards include redundant 100 MB Ethernet ports which allow operator stations to communicate directly with the upgraded, redundant controllers and Mark VIe modules.

Operator and Maintenance Software

The Mark VIe runs off a Windows® 7 HMI. With this HMI, your existing operator and maintenance stations will have the latest HMI/SCADA CIMPLICITY* graphics system featuring easy screen navigation, alarm/event management, and trending tools. Your Windows 7 HMIs are able to run GE's cyber security applications to help provide security and compliance with current and emerging cyber security standards.

In addition, Windows 7 HMIs use the latest versions of ControlST* and ToolboxST*, which will augment your existing Modbus® and TCP-IP GSM links to plant controls. This modern 32-bit software suite includes drag-and-drop type editors, math blocks, macros, and trending tools. Changes can be downloaded online without rebooting the new controllers. Your existing site-specific software is converted using GE's Tree File Importer into the latest ControlST turbine control application, using an ISO 9001 certified process.

Field Wiring and Turbine Devices

We retain your existing field wiring and turbine devices, resulting in a reduced installation time and elimination of loop checks. The system modifications and board additions are made within the existing panels and system footprint.

Future Expandability

With the ability of the Mark VIe I/O blocks to communicate through CAT 5 or fiber cable, you'll have the ability to expand your operation leveraging the entire Mark VIe family of modules. Advanced I/O capability includes SIL 3 capable solutions, and remote I/O cabinets enhance existing controls. A variety of I/O busses are also available, such as HART® and PROFIBUS-DP™.

Cyber Security

Upgrading to the Mark VIe control system allows you to take advantage of GE's cyber security solutions, helping reduce your risk. Our cyber security solution provides defense-in-depth protection. The SecurityST* Mark VIe Solution and Commissioning Services is Achilles™ Practice Certified – Bronze indicating the solution has undergone strict cyber security best practices demonstrating to customers that systems are developed and implemented securely. The Security ST appliance and Cyber Asset Protection Subscription are designed to support the plant operation's compliance to cyber security standards and guidelines including NERC CIP, NEI 08-09 and ISA99/IEC 62443.

Mechanical Solutions

GE's electromechanical solutions are a critical piece of a control system migration or full panel retrofit. Integration considerations need to be made based on the age of the control system and the interface with the software and electromechanical components. GE has the expertise and OEM knowledge to evaluate these needs to ensure assets remain reliable. Our solutions have the potential to improve performance, online capability, provide redundancy and fit within the current operations envelope.

Critical components that need to be evaluated include transducers and transmitters, fuel valves and fuel skids, and speed sensing. GE also provides solutions for Trip Manifold Assemblies (TMAs), Hydraulic Power Units (HPUs), and other assets that are important to operations. Our experience includes steam, hydro, and gas turbines as well as balance of plant. We have the application knowledge to make sure that your assets are upgraded correctly.

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