



OpFlex* Software Enhancement Modules

System Diagnostics Package

Enhanced System Features and Functionality

GE is proud to provide controls you can trust. You can now benefit from new and improved features on your Mark*VIe control system and add significant new performance enhancements that provide improved reliability, diagnostic, trip prevention, and productivity capabilities to your Mark VIe turbine control.

Benefits

- Improved troubleshooting time to identify issues
- Improved availability and system reliability
- Improved operator understanding of Gas turbine operation
- Enhanced troubleshooting ability for trips
- Ability to reset systems that may trip offline

The System Diagnostics Package consists of the following modules:

System Reset Function

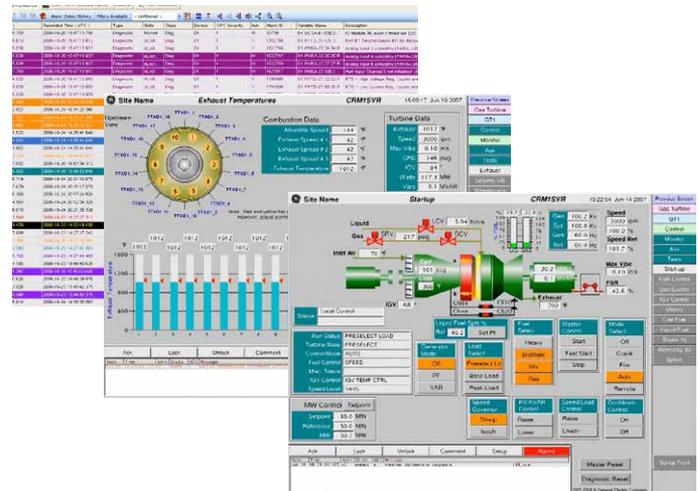
System Reset enables an auxiliary system that trips offline to be reset separately from a complete turbine master reset. A master reset resets all alarms and conditions turbine-wide, while a System Reset will only reset the alarms and conditions on a particular system. The System Reset function is available for inlet bleed heat, water injection, and steam injection for power augmentation systems because these systems can fault and shut down without causing a full turbine trip or shutdown. This improves the availability of the systems that can be reset, while preserving additional turbine alarms and conditions for future troubleshooting.

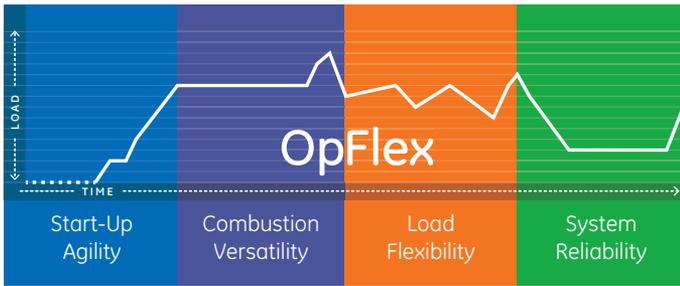
Expanded Alarm Help

Alarm Help on the HMI provides enhanced troubleshooting information for an operator in a convenient onscreen format. Traditionally, alarm information was available in GEK form but was not always complete, site-specific or user-friendly. When the Alarm Help icon is selected on the screen, relevant information is displayed in a separate window—including the signal driving the alarm, alarm description, possible causes, recommended action, associated hardware, and whether a master reset is required to reset the alarm.

Online P&ID Function

This online turbine P&ID Screens package will provide the customer HMI screens based on the turbine system P&IDs. These screens will enhance operational information to the operator by providing graphical display rather than textual display. All the device status will be shown on the online P&ID screens. The operators and maintenance personnel will be able to respond to alarms/trips/failures faster with the use of dynamic P&ID screens.



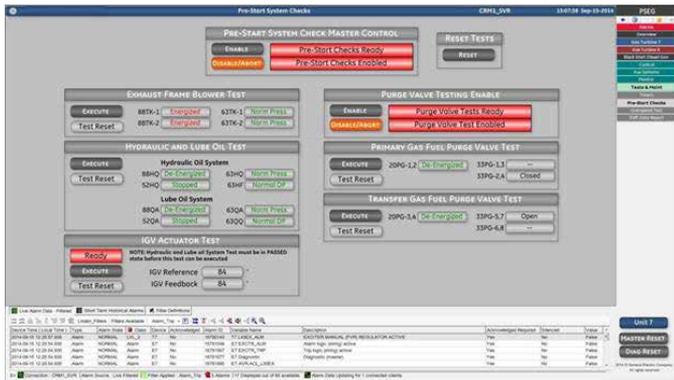


First Out Logic

First Out Logic provides a simple visual indication of the first signal that caused a trip condition. The operator will see the first trip as a flashing trip indicator on the existing trip screen. Currently when a trip occurs, multiple effect trips occur and operators do not know what actually caused the trip. Changes to the control software include adding a corresponding First Out Boolean to complement each trip and existing trip screen modification on the HMI.

Swirl Chart Function and Graphic

The source of high temperature spread can often be traced back to a specific location in the combustion chamber location. This application identifies the high and low spots in the exhaust temperature profile, back-traces the exhaust temperature anomaly through the gas swirl angle to the chamber location—and identifies the hardware which is capable of producing a variation in the combustion pattern.



Applicability

Feature	Package	Frame Applicability								
		2-Shaft		3-Shaft						
		32	52	B/E Class			F Class			
		51	6B	7E	9E	6FA	7F	9F		
Swirl Chart HMI Display	System Diagnostics	0	0	X	X	X	X	X	X	X
Alarm Help	System Diagnostics	X	X	X	X	X	X	X	X	X
First Out Logic	System Diagnostics	X	X	X	X	X	X	X	X	X
Online P&ID Function	System Diagnostics	X	X	X	X	X	X	X	X	X
System Reset Function	System Diagnostics	X	X	X	X	X	X	X	X	X

Note: "X" indicates available feature. "0" means feature not available.

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