




ActivePoint* HMI

Improved user experience for reduced cost and increased operator efficiency

Because of changing industry dynamics, there are fewer operators working in plants, and they have more responsibility. According to the ASM Consortium, unexpected events in industrial settings—turbine trips and equipment failures—cost up to \$10B in annual lost production. Up to 40% of abnormal events can be attributable to operator error, and up to 88% of accidents are associated with poor situational awareness. One reason is complex or poorly engineered HMIs (Human Machine Interfaces), the physical and digital tools operators use to experience and control multi-million dollar gas turbines and other plant equipment.

GE worked with 100+ global power plant operators to develop its ActivePoint* HMI solution to increase plant operator efficiency and awareness. The improved system provides simpler and more intuitive navigation while reducing actionable alarms by as much as 80%. It complies with the standard ISA 18.2 for Alarm Rationalization, ISA 101 for HMI User Experience design, the High Performance HMI Handbook, and other industry standards.

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SIMPLICITY
 Improves situational awareness and decreases costly errors/lost production
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INTUITIVENESS
 One-button plant startup/shutdown decreases \$1MM+ misses.
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RESPONSIVENESS
 Improves due to an 80% actionable alarms reduction

Total solution enabling system monitoring and controlling from any device, anytime, anywhere.



What is the ActivePoint HMI?

- **User Experience** that conforms to GE Power guidelines GEK121341, GEK121342, & GEK121344, based on ISA 101 for HMI User Experience Design.
- **Rationalized Alarms** that conform to GE Power guidelines GEK121341 & GEK121343, based on ISA 18.2 for Alarm Rationalization.
- **Rationalized Protection** that has gone through GE Power's engineering process to streamline trips, runbacks, shutdowns, pre-start checks, and permissives.
- ActivePoint HMI can be implemented on both Thick and Thin client HMI solutions.
- Implements **GE Intellectual Property** within the power generation space.

HMI Approach

| | | |
|------------------|---------------------------|--|
| SIMPLE | Minimalism | Improves detection. |
| | Color Palette | Decreases cognitive workload. |
| INTUITIVE | Visual Coding | Increases speed of recognition. |
| | Information Layout | Provides intuitive, process-oriented views. |
| SEAMLESS | Contextual Data | Reduces information overload. |
| | Imbedded Trend | Provides more information when it is useful. |
| | Screen Hierarchy | Reflects the operator's mental model. |
| CONFIDENT | Navigation | Enables quick, intuitive way-finding. |
| | Alarm Presentation | Enables faster detection and understanding. |



Before



After



Key Performance Indicators (KPIs)

21%+ usability improvement for users and prototypes tested
First time opening or viewing previous screen that was opened

- < 2 seconds to open
- < 1 second to populate
- <= 1 second to refresh
- 80% actionable alarms reduction
- 30 - 40% reduction in trip causing protection functions.

Required Hardware and Software

- Mark* Vle controller; Mark Vle DCS and HMI system for control
- Latest Proficy Cimplicity and ControlST* versions that work together
- Traditional (Thick Client) HMI Computers or Control Servers (Thin Client) System, validated and approved for use by GE
- Latest Windows Server or Windows OS validated and approved for use by GE
- Up to 4 Monitors that support 16:9 aspect ratio
- Thin Clients use Remote Desktop session for client connection to a server
- 1920 x 1080 widescreen monitor resolutions (16:9).

Additional Offerings

Improve ActivePoint* HMI adoption success with classroom training, on-the-job coaching, and a scenario-based training simulator

Third- Party DCS

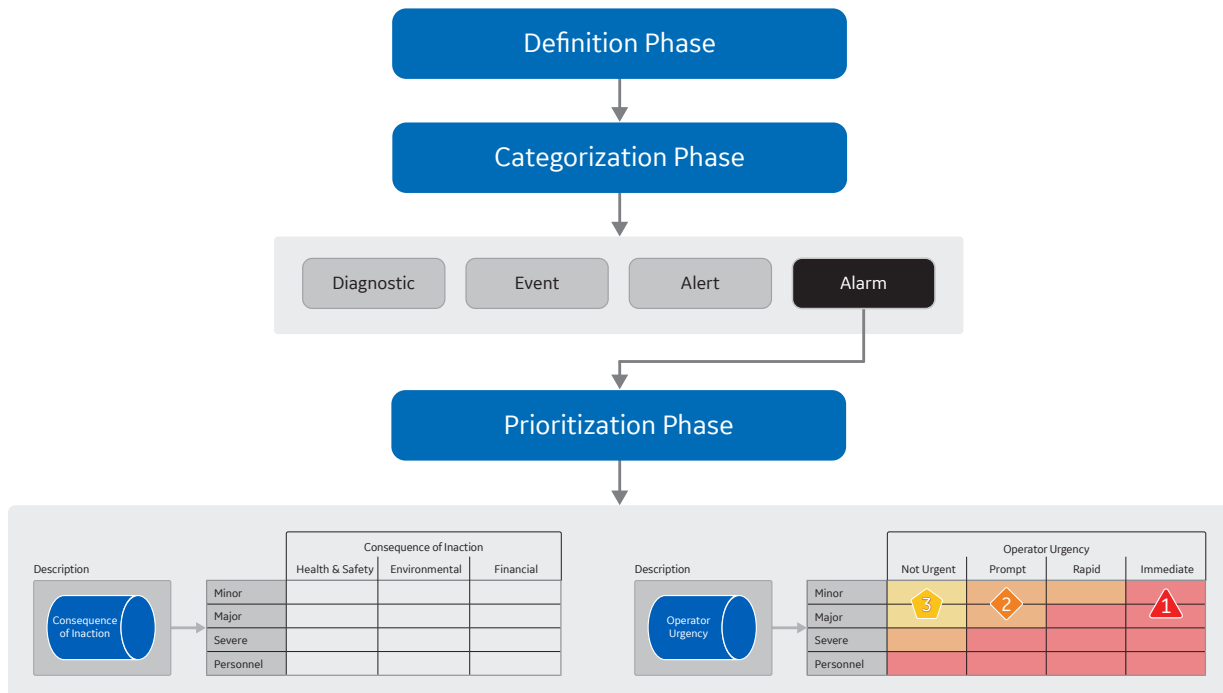
For balance of plant screens or DCS integration:

- GE alarm configuration and presentation functionality has to be duplicated.
- GE HMI screens have to be recreated.
- GE NDA, licensing agreement, and licensing fee.

ActivePoint Protection Rationalization Process

- The objective of the Protection Rationalization initiative is to improve turbine reliability by removing or reducing protective actions that are taken in response to faults. The expected result is 30 - 40% reduction in trip causing protections.
- The rationalization is accomplished by examining each fault and questioning whether the driven protective action is appropriate. If it is not, a less restrictive action or no action is assigned to the fault.

ActivePoint Alarm Rationalization Process



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