

inBound displays a plant's safe operating limits and proximity of the current operating point to those limits to improve safety and compliance.

The Challenge

Safe operating limit information is maintained by various groups within the plant and is not readily available to operators. As these variables are often automation system configuration parameters entered by humans, there is the possibility that values outside of the safety and compliance envelope have been entered. Additionally, some processes have dynamic safe operating limits that are continually changing, which is challenging for plant operators to manage.

The PAS Solution

inBound is a layered application for PAS' market-leading PlantState Suite© alarm management software that aggregates, validates, and displays physical, design, and safe operating limits. These values may be manually entered, calculated, or imported from other applications and databases to provide maximum flexibility.

inBound provides engineers with the capability to develop a boundary hierarchy, which allows the application to automatically detect and report deviations such as an alarm setting that is higher than an safety instrumented system trip point. This capability provides additional assurance that modifications to configuration parameters such as alarm limits and instrument ranges remain within the safe operating envelope of the plant. Figure 1 is an example of a boundary hierarchy.

Safe operating limit information is displayed on the control system graphics in current operating context by special display objects, which allow operators to quickly and unambiguously determine the plant's current state relative to its safe operating limits. Compatible versions of these objects are available for most of the major automation systems.

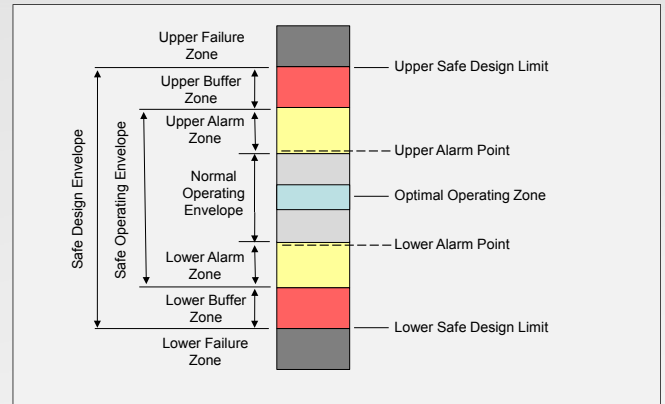
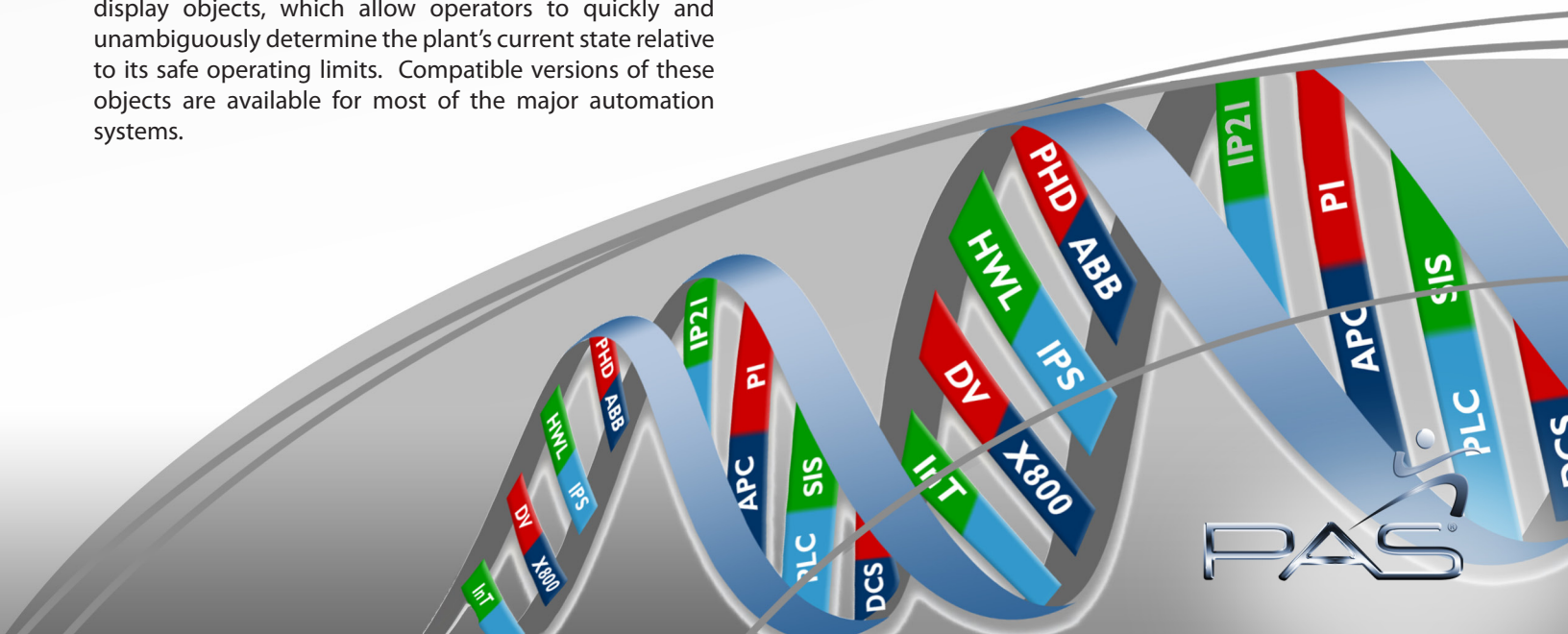


Figure 1: Example of Boundary Hierarchy

inBound key benefits:

- Aggregates, validates, and displays safe operating limits in real-time
- Presents safe operating limits in context within your control system graphic displays
- Allows operators to instantly determine a plants' current state relative to its safe operating limits
- Provides visibility to violations of safe operating limits



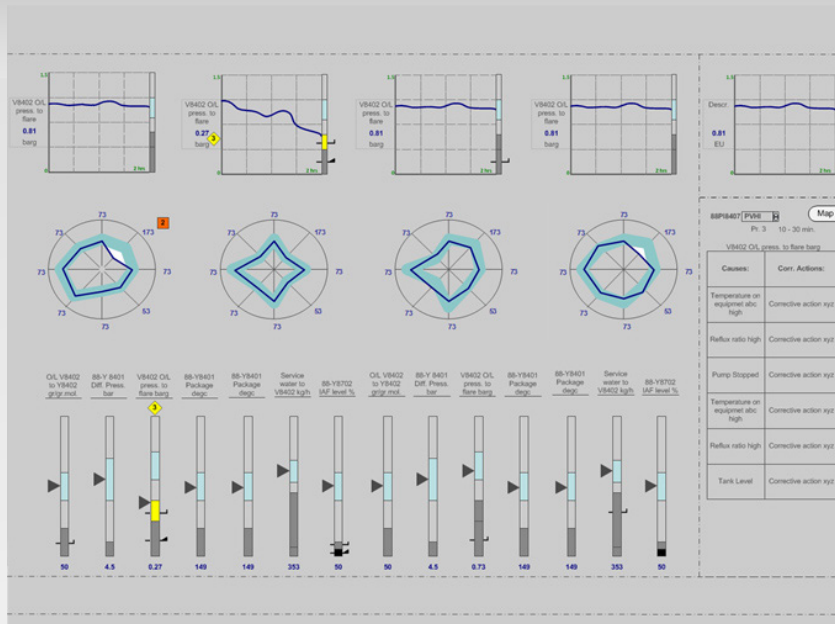


Figure 2: Example of an inBound Operating Graphic Display

Safe Operating Limits Presented in Context

inBound displays safe operating data in a high-performance graphic display that reveals critical information all within context. The graphic display uses pattern recognition to enable quick interpretation of the plant's current state.

Figure 2 is an example of inBound's safe operating data included in a high-performance graphic display. The light blue color indicates optimal operating ranges with uncolored areas above and below it indicating the full normal range of operability. When the value moves beyond the normal operating range and near an alarm limit boundary, a color change to yellow occurs along with a diamond icon, which indicates a lower priority alarm. If the value continues to stray further from normal and the next alarm limit boundary is crossed, a color change to red occurs along with a square red icon indicating it is of higher priority. By selecting a specific alarm, the table in the lower right corner of the graphic provides a list of causes and actions for it. Note the small horizontal bars on some of the display elements. These indicate safe operating limits and may be stationary for fixed limits, or moveable for dynamic ones.

Monitor Dynamic Environmental Constraints

inBound exposes environmental limits in context enabling operators to visualize the process's proximity to boundaries in real time, and take action before an excursion occurs. It uses the plant's Master Alarm Database as the source of its information and applications such as inferential analyzers and simulators that are capable of writing to a SQL database may provide dynamic boundary data. Additionally, inBound provides users with exception reports of boundary excursions to facilitate compliance.

About PAS

PAS (www.pas.com) improves human reliability in power and process plants worldwide to enhance plant safety, compliance and profitability. We make essential information easily available, in context, and actionable by linking people, systems, and physical assets.

Our comprehensive portfolio includes solutions for Alarm Management, Automation Configuration Management, Control Loop Performance Optimization, and High-Performance Human-Machine Interfaces.



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