

Alarm Rationalization: Optimize the Design & Performance of Your DeltaV System

Alarm Rationalization: A Key Activity in the ISA-18.2 Alarm Management Lifecycle

Modern control systems make it easy to add alarms without significant effort, cost, or consideration for whether they are truly needed. This has led to alarm systems that hinder, rather than help, operators via nuisance alarms, alarm floods, incorrectly prioritized alarms, and alarm overload. Alarm rationalization, one of the key activities in ISA-18.2's alarm management lifecycle, can address these issues and optimize the alarm system performance.

Alarm rationalization is the process of systematically reviewing existing or candidate alarms to make sure that they are justified and necessary. It includes defining the alarm's attributes (such as limit, priority, and classification) and documenting the cause, consequence, and corrective action all in a Master Alarm Database (MADB).

ISA-18.2 is expected to be accepted as good engineering practice by regulators (such as OSHA) and insurance bodies.

Course Description:



In this workshop, attendees will learn how to rationalize alarms for greenfield (new) or brownfield (existing) applications in order to optimize performance of their DeltaV alarm systems and address common alarm management issues. The class immerses participants in discussion and hands on exercises which have been designed to demonstrate the best practices for rationalization as taken from the ISA-18.2 alarm management standard and EEMUA 191 guideline. It provides an overview of the entire alarm management lifecycle so students can see how rationalization fits into an effective alarm management program. The class also discusses considerations for how to create an alarm philosophy document by reviewing some of the key topics that should be contained in this document.

exida's SILAlarm™ tool, which is an Emerson Process Management Solution Alliance product for alarm management, will be used to guide the participants through the rationalization process and capture the results.

Focus on Addressing Common Alarm Management Issues

- Reduce the number of alarms presented to the operator (to only those that are necessary)
- Prevent alarm floods
- Suppress alarms when they are not meaningful (when equipment is out-of-service)
- Eliminate nuisance alarms (chattering alarms, stale / standing alarms)
- Prioritize alarms so that operators know which ones to respond to first
- Eliminate frequently occurring alarms / "bad actors"
- Ensure that operators know how to respond to each alarm
- Improve the speed and consistency of operator response to alarms



What Attendees will learn from the class:

- Create an Alarm Philosophy Document that leverages the capabilities of the DeltaV system
- Transfer alarm configuration settings to / from DeltaV via Bulk Edit (User Defined Format files)
- Criteria for determining when an alarm is valid and necessary
- Prioritizing alarms based on potential consequences and time to respond
- Establishing alarm limits and evaluating operator response time
- Alarm classification: how to do it and what to use the results for
- Implement conditional alarming (hysteresis, on / off delay) to eliminate chattering alarms
- Configure Alarm Shelving to allow operators to manually suppress alarms on a temporary basis
- Use of Advanced Alarming techniques (first-out alarming, state-based (static) suppression, alarm flood (dynamic) suppression, state-based alarming to ensure alarms are relevant and meaningful when presented to the operator
- Use DeltaV Analyze to benchmark alarm system performance and identify rationalization goals / targets
- Techniques for treating system / instrument diagnostic alarms (e.g. PV BAD alarms) and alerts
- Implementing management of change (MOC) for the Master Alarm Database
- Populate DeltaV Alarm Help / create Alarm Response Procedures from the rationalization results
- Techniques for managing / ensuring a successful rationalization project

| Alarm List - Operator Decision Support | | | |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------|
| LAHH103, LT103 | | | |
| Base Response On | Process Safety Time (minutes) | Cause | Confirmation |
| Consequence Of No Action | 30 | Control Loop LIC-201 Fails Valve LV-201 Closed | KO Drum Level - LIC201 KO Drum High Level - LAH 202 |
| Liquid carryover to K-102, equipment damage, personnel exposure | Design Intent | | |
| Alarm Message | Prevent KO Drum from overflowing | Corrective Actions | Comments |
| KO Drum High High Level | <input checked="" type="checkbox"/> Alarm Enabled <input checked="" type="checkbox"/> Include in Alarm Response Manual | Manually Open Valve LV-201 | Should Trip SIS Interlock I-101 |
| Priority Level | | | |
| Warning | | | |

Who Should Attend:

Those responsible for leading/facilitating alarm rationalization, maintaining the master alarm database, or configuring the DeltaV system based on the results of rationalization.

What the Course Includes:

- Course notes, SILAlarm Users Manual / Best Practices Handbook
- Two (2) weeks of online access to SILAlarm after the class
- SILAlarm Master Alarm Database loaded with a representative portion of your DeltaV Configuration

Course Length:

2 days

Instructor Bio

Todd Stauffer, PE, is responsible for marketing and business development of exida's alarm management products and services (training, consulting, engineering tools). He is the product manager for SILAlarm and has led its development working closely with the Emerson Process Management team. Todd is an editor and voting member of the ISA-18.2 standards committee on alarm management and currently is the co-chair of ISA-18.2's Working Group 3 chartered with writing the Basic Alarm Design technical report. He is an instructor for ISA's training class "Introduction to the Management of Alarm Systems". Todd has published and presented numerous papers on alarm management.

