Alarm Management Systems

Solutions for Optimizing Oil & Gas Operations
Alarms are an essential part of modern systems and the primary means of alerting operators of abnormal situations in their facilities. Even the best designed systems can become ineffective in the absence of alarms, resulting in potential human and financial setbacks.

Research has shown that many process plants have improperly configured alarms that do not follow international guidelines and add to operators’ confusion. For an effective alarm system and smooth unobstructed plant operations, alarms need to be relevant, unique, timely, prioritized and understandable. Nearly all facilities with ineffective alarm systems show distinct symptoms of poor alarm system design.

Symptoms of Poor Alarm System Design:

- A significant number of alarms are raised by minor issues
- Alarms remain active for very long periods of time
- There are no guidelines for alarm implementation
- Operators are unsure of how to respond to some alarms
- Processes run normally despite some alarms constantly going off
- Some alarms do not require an operator’s response or attention
- Numerous alarms go off during routine operation but have no purpose

A Need for Good Alarm Management

### Safety
- Poorly configured alarms risk the safety of:
  - Plant, Personnel, Equipment
- Good alarms increase safety of all three by:
  - Reducing unnecessary alarms
  - Prioritizing important alarms

### Profitability
- Alarms not configured properly result in:
  - Reduced production revenue
  - Losses from damaged assets
- Properly configured alarms increase profitability by:
  - Increasing uptime
  - Decreasing incidental losses

### Human Factor
- Over 40% of incidents are caused by human factors
- Poorly configured alarms add to these risks
- Good alarms reduce errors from the human factor by facilitating operators
**Philosophy**
A comprehensive document of work processes, sites and control systems along with best practices for alarm management.

INTECH provides a unique customer-tailored Alarm Philosophy Document.

**Identification**
Data is collected for a baseline assessment of current alarm systems against standards, “Bad Actor” alarms are identified.

INTECH analyzes data for 6-8 weeks and helps customers understand the cause of bad actors.

**Rationalization**
Areas of trouble in the alarm systems are identified and compared to the alarm philosophy document to evaluate a course of action.

INTECH helps the site team understand, classify and prioritize alarms.

**Design**
Alarms are re-engineered according to the alarm principles defined in the philosophy document.

INTECH makes the Master Alarms Database (MADB) for the site.

**Implementation**
The re-engineered alarms are implemented and documented; relevant operators are trained how to respond to alarms.

INTECH installs the MADB and performance management tools; also trains operators.

**Operation**
The site is run with the new alarm systems. Operator-supporting tools are installed; further trainings are given.

INTECH trains operators how to handle alarms and provides alarm management tools.

**Maintenance**
Alarms are periodically calibrated and tested for accuracy, repairs and replacement activities are performed.

INTECH follows standard maintenance procedures and performs fidelity tests.

**Management of Change**
A complete description of processes to update, change or remove alarms in order to meet changing requirements or optimize systems.

**Monitoring & Assessment**
Data is monitored and benchmarked against performance standards defined in the alarm philosophy.

**Audit**
Part of the continuous improvement effort, with periodic alarm and system audits.

**ISA 18.2 Compliant Alarms Management Life Cycle**
INTECH’s Alarm Management Solutions ensure that incidents occurring from bad alarm configuration are minimized. INTECH achieves this by classifying, prioritizing and optimizing alarms to generate useful information for operators. This ensures that operators are immediately alerted to issues that can potentially cause serious damage to the plant and environment, and offset a large portion of the plant’s past profitability.

**Reduction in Overall Alarms:**

Most modern alarm systems are implemented at the software level and require no physical hardware installation, this has led to a significant increase in the number of available alarms at any site - a growth fueled by international standards that require periodic monitoring for process assessment. The major drawback to all this however is an overwhelming amount of alarm notifications being constantly generated during operation in the absence of alarm management.

**INTECH’s Alarm Management Suite**

**Alarms Analytics Dashboards Module**

INTECH delivers software and services for operations and process optimization with a variety of deterministic optimization techniques that may be manually or automatically selected based on the objective function and constraints. Alarms Analytics Dashboards module delivers KPIs, metrics and reports based on ISA 18.2 standards and EEMUA 191 guidelines.

**Alarms Rationalization Module**

This module provides comprehensive data management for identifying & documenting causes, consequences, and corrective actions as well as alarm set points, alarm enabled states, priorities, purpose, operator action, consequence of not attending alarm, min. time to respond to the alarm, dead band, requirement of alarms suppression and requirement of de-bounce timer

**Static, State-Based and Dynamic Alarms Suppression Module**

INTECH, with it’s rich experience in operations and process, identifies process and equipment states. Based on ON, OFF, INITATING, START UP, SHUT DOWN etc. states, alarms can be dynamically enabled or disabled.
INTECH’s Advanced Solutions Deployment - Software Architecture

1. Data Acquisition
   - OPC Server
   - Production Data
   - Historic Process Data

2. Advanced Process Historian
   - Process Historian
   - RAW DATA
   - RESULTS
   - Advanced Process Historian to SAP PM Interface
   - Historic Process Data

3. Alarm Management
   - Alarms & Events AE/IF
   - Alarms Analysis, Rationalization Module
   - Control Loop Performance Management Module

4. Control Loop Performance Management
   - Loop Tuning DA/IF

5. Reporting
   - Data Acquisition
   - OPC Server
   - MS-Excel Reports
   - Ontology Framework
   - Excel-Data Link
   - Thin Client WEB-APPS (Browser)

6. Condition based Maint.
   - ACE (Advanced Calculation Engine)
     Tank Mass/Vol KPI, Run Hours, total Starts, Efficiency Calculations
   - Advanced Process Historian to SAP PM Interface
   - Equipment Run Hours, Starts and KPIs Efficiencies

7. Processing Simulation
   - Process Engr.
   - Process Simulation Server

8. PDC/Historian Interface
   - Manual Logging
   - Manual Logging / Hand Held Terminal Client

LEGEND:
- Already Deployed Systems within IT / CCR Landscape
- Sometimes Already Deployed or To Be Offered by INTECH
- Visual Interfaces (GUI) - To be deployed by INTECH
What Our Customers Say

“I commend INTECH’s knowledge of alarm management, dedication, commitment and effort. Most importantly, works have been completed safely and INTECH has been able to work successfully in our diverse environment”

Central Maintenance Coordinator

“INTECH’s team worked with extraordinary zeal & efforts at the Adhi Electronic Flow Metering Project which included on-line trends and alarms of sales gas parameters’ limits. The competency level and performance of their deputed team is satisfactory and commendable”

Deputy Chief Engineer

“I commend you on your efforts in customizing the business analysis software for trial deployment for a Web Based Alarm Management Dashboard. It meets our objectives and has produced the desired results”

Control & Automation Leader

Vendor Expertise

Standards & Certifications

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