



# ACCELERATING INNOVATION



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# **3-1513 Alarm Management: From Rationalization to Results using AgileOps**

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# Agenda

**Introduction**

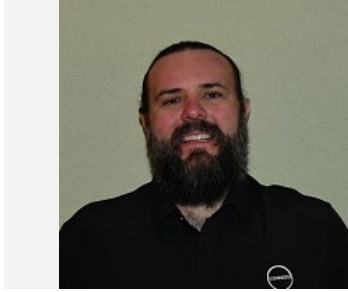
**About Covestro**

**Alarm Management Cycle**

**Implementation**

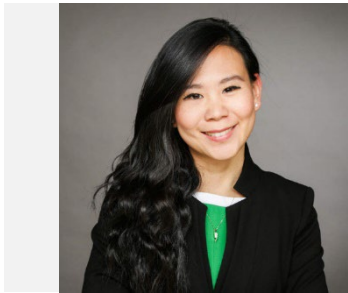
**AgileOps**

**Results**



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Principle Control System Engineer / Covestro



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Automation Group Lead / Covestro





## A little about Covestro...

*Leading manufacturer and supplier of premium polymers*

Previously a division of Bayer

Headquartered in Germany

€18.0 bn in group sales

18,000 Employees

50 production sites worldwide

Products:

- Polycarbonates
- Urethane Components
- Base Chemicals
- Engineering Plastics
- Coatings and Adhesives
- Tailored Urethanes
- Thermoplastic Polyurethanes
- Specialty Films
- Elastomers



# 50 Production Sites Globally





# A little more about Covestro...

## *Baytown, Texas Site*

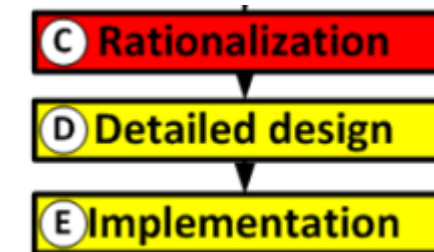
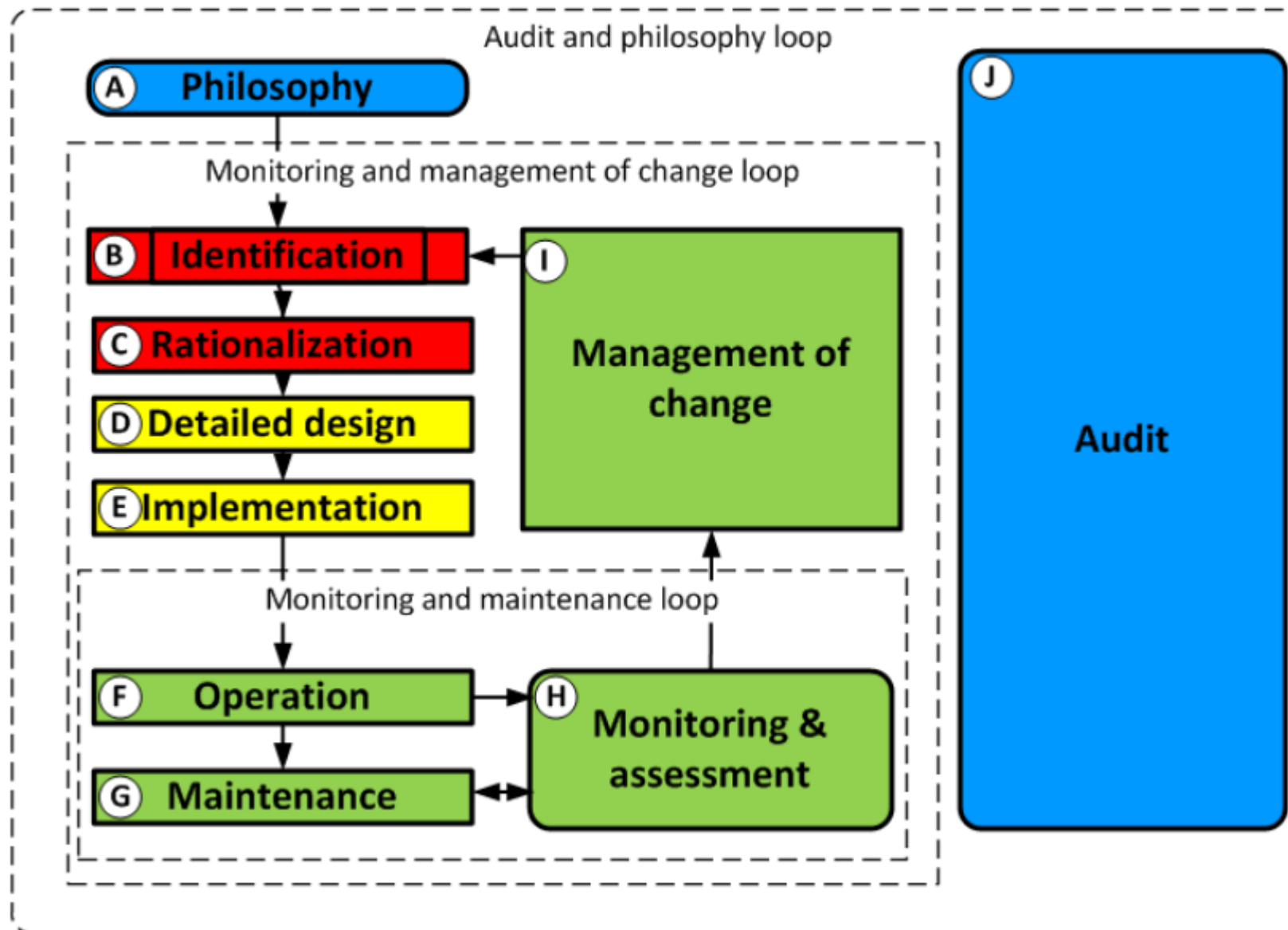
- Largest Covestro Production Site in North America
- 30-minute Drive East of Houston
- Built in 1971
- 1,100 Employees
- 19 Separate DeltaV Systems
- ~54,000 DSTs
- 4 AgileOps Servers



# Alarm Management Cycle

*General Overview*

# ISA18.2 Alarm Lifecycle



# Implementation

*The Options*

# Implementation

## E Implementation

We've finished the "hard" part...now just go implement the recommendations...how long could that possibly take?

- Factors that can influence the best possible option for implementation
  - Magnitude of the changes – number and complexity
  - Are downloads possible? When is the next shutdown opportunity?
  - Schedule/Deadlines for implementations
- Options Covestro Considered
  - Option 1
    - Engage impact partner to bulk edit changes
  - Option 2
    - Manual changes – either online with upload or database change and download using in-house personnel
  - Option 3
    - AgileOps

# Implementation



## FACTORS

- Magnitude of the changes – number and complexity
  - 12903 Changes needed in one system

Alarm SP Change	Enable	Disable	Priority	Conditional
225	513	9995	2067	103

- Are downloads possible? When is the next shutdown opportunity?
  - Downloads possible for some items
  - Some plant areas available on 18month TAR frequency others available only >5 year intervals
- Schedule/Deadlines for implementations
  - ASAP
  - Alarm Rationalization implemented prior to roll out of HPG project

# Option 1 – Bulk Edit & Download

- Requires download of all modules
- One time expense to implement change
- Quickest delivery if downloads are possible
- Estimated cost ~\$35,000



## Option 2 – Manual On-Line

- Internal labor intensive
- Extended delivery time
- Lowest direct “cost”-all internal resources
- Estimated completion
  - Full Time 6 weeks
  - 1 Day a week 41 weeks
- Still requires downloads for conditional alarms



## Option 3 – OPC via AgileOps

- Minimize downloads – only conditional alarms require module downloads
- Alarm SP, Priority, Enable/Disable written via OPC to controller then uploaded to database.
- TIC ~\$32,000
- Quickest path to completion
- When complete software is still available for additional bulk changes for projects, reviews, other changes

# AgileOps

*The Quicker Easier Approach*

# AgileOps

## Import Data

- Cross reference data from alarm rationalization to AOPs Import Files
- Utilized AOPS Reports
  - Alarm Index
  - Causes/Consequences/Actions
  - Alarm Boundary

## Implement

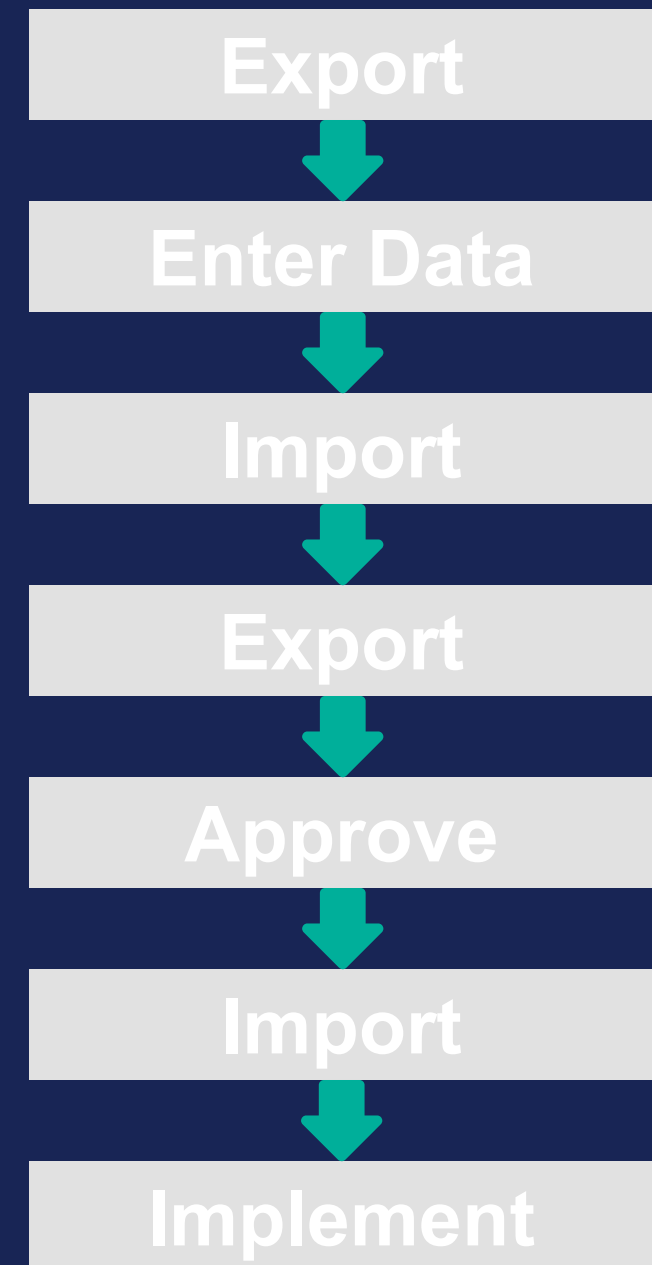
- One parameters are “approved” in AOPS use Audit & Enforce to push values

## Approach

- First time using software so phased approach was taken
- Audit & Enforce a section of plant not in continuous operation – Railcar loading/tank truck loading etc
- Audit & Enforce less critical process area (storage)
- Audit and Enforce Remaining

# Import Data

- Export Alarm Index from AOPS
- Use standard excel data manipulation to get values from completed rationalization into AOPs import files
  - We used a unique identifier for each alarm and vlookup functions for each of the parameters to import (Trip Point, Priority, Enable)
- Import Alarm Index to AOPS
- Export Alarm Index from AOPS
- Approve first batch of values to enforce
- Import Alarm Index to AOPS



# Import Data

AgileOps™

APPLICATIONS

- Database
- Synchronize

CONFIGURATION

- System Information
- System Settings
- Organization
- Area Locations
- Users
- Connections
- Applications
- State Definitions
- Alarm Definitions
- Priorities
- Units
- Reports/Tasks
- Diagnostics
- Database

AgileOps Reports/Tasks

Scheduled | Queued Reports

Request Report

Report Type: Alarm Index Export

Report Schedule: Run/Queue Immediately

Connection: CA

Export Format: [ ] Select

OK Cancel

Options Actions

0 items in 1 pages





# Import Data

## AgileOps Reports/Tasks

Scheduled / Queued Reports

Name	Status	Requested By	Last Modified	Next Evaluation	Schedule	Options	Actions
There are currently no scheduled reports. Click button below to request a new report.							
<a href="#">+ Request Report/Task</a> <input type="checkbox"/> Show System Tasks							
 Page size: 10							0 items in 1 pages

## Completed Reports

Name	Requested By	TimeStamp	Expires	Size	Options	Details	Delete
Alarm Index Export	AD\MJYKY	2/3/2025 7:22 AM	2/10/2025 7:22 AM	346573 records			
 Page size: 10							1 items in 1 pages

# Import Data

**Download**

**Details**

AgileOps Reports/Tasks														
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
System	Device	Description	Alarm	AlarmEnabled	Property	CurrentValue	ProposedValue	ApprovedValue	RevisionComments	BoundaryID	BoundaryNotes	ChangesProposed	Proposed	Comments
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	Trip Point	25	25		Approved Value Demoted by User	8	Populated from Alarm Rationalization	Yes		
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	Time Delay On	0				8	Populated from Alarm Rationalization	No		
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	Time Delay Off	0				8	Populated from Alarm Rationalization	No		
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	Suggested Priority	(NotApplicable)	ADVISORY		Approved Value Demoted by User	8	Populated from Alarm Rationalization	Yes		
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	Source	31.17937				8	Populated from Alarm Rationalization	No		
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	SIS Activation	FALSE				8	Populated from Alarm Rationalization	No		
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	Priority Rationale					8	Populated from Alarm Rationalization	No		
CA_ABS	325AC01402	NAOH WT%	HI_ALM	Enabled	Priority	ADVISORY	ADVISORY		Approved Value Demoted by User	8	Populated from Alarm Rationalization	Yes		

**Download Report**

File Format:

**Proposed (Alarm Index)**

<State Enumeration> High, Low, Urgent (for Priority)  
 <Value> Enable, Disable (for Enable)  
 <Boolean> or 80 (for Trip Point)  
 <Action to Take> <Approve> (to Approve Already Proposed Value)  
 <Demote> (to Demote Approved or Proposed Value)

**Propose/Approve**

# Audit & Enforce

- Run Audit & Enforce report “Read-Only” and review changes that will be made to controller
- Once satisfied that only desired parameters will be enforced notify operations
- Run Audit & Enforce



# Audit & Enforce

**Request**

0 items in 1 pages

### Request Report

**Report Type** Audit/Enforce Approved Alarms

**Report Schedule** Run/Queue Immediately

**Selection Basis** Connection

**Write Priority** A

**Connection** CA

**Audit/Read-Only**

**Maximum Audits/Minute** 1000

**Approved Properties Only**

**Exclusion Criteria (Approved States)**

**Desired Properties** Enabled; Priority; Trip Point

- Deadband
- Enabled
- Management Status
- Priority
- Severity
- Time Delay Off
- Time Delay On
- Trip Point

Options Actions

0 items in 1 pages

# Audit & Enforce

**Audit Only Result**

Download Report

Device	Alarm	Property	LastRead	LastApproved	ResultType	Error
V944-AB11-L2902	HI_ALM	Trip Point	75	95	Discrepant	
V944-TA91-A2103	LO_ALM	Trip Point	10	5	Discrepant	
V944-TA91-A2103	HI_ALM	Trip Point	90	5	Discrepant	
325AI00201A	LO_ALM	Trip Point	0	Default		
325AI00201B	HI_HI_ALM	Trip Point	500	Default		
325AI00201A	LO_LO_ALM	Trip Point	0	Default		
325AI00201A	HI_ALM	Trip Point	40	Default		
325AC01402	HI_ALM	Trip Point	25	Default		
325AC01402	DV_LO_ALM	Trip Point	0	Default		
325AC01402	LO_LO_ALM	Trip Point	0	Default		

**Enforcement Report**

Device	Alarm	Property	LastRead	LastApproved	ResultType	Error
V944-AB11-L2902	HI_ALM	Trip Point	75	95	Enforced	
V944-TA91-A2103	LO_ALM	Trip Point	10	5	Enforced	
V944-TA91-A2103	HI_ALM	Trip Point	90	5	Enforced	

**Download**

# Approach

- Phased Approach
  - Phase 1 – Bulk Chemical Railcar loading area
    - Batch type process (not in continuous operation)
    - ~500 changes to this area
    - No issues
  - Phase 2 – Caustic Storage Area
    - Continuously running, but operations on standby to restart pumps in the event of a trip
    - ~2000 changes to this area
    - No Issues
  - Phase 3 – Remaining Areas
    - ~10000 Changes remain
    - No Issues

# Results

*Reaping the Benefits*

# KPIs Pre and Post Rationalization

	% Time in Flood	Max Flood	Flood Periods	Alarm Rate	Standing
Pre	4.46	185.5	111.8	8.8	127





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# Thank You