



8<sup>TH</sup> MAY 2025

# DRIVING PROJECT EXCELLENCE AND OPERATIONAL EFFICIENCY WITH ADVANCED AUTOMATION

Viksit Gujarat: Viksit Bharat@2047

Indian **CHEMICAL** News

**GUJARAT GP**  
**CHEM & PETCHEM**  
**CONFERENCE 2025**

Viksit Gujarat: Viksit Bharat@2047

May 8-9, 2025 | Hyatt Place, Bharuch

*Speaker*

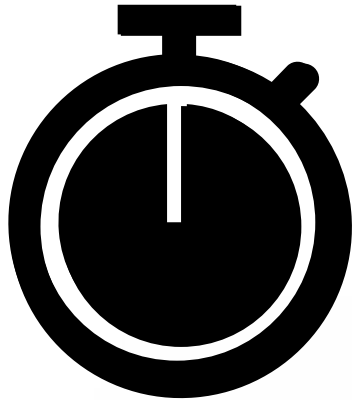
**Mr. Mayank Roy**  
Sales Manager – Chemical & Life Sciences  
Energy Industries, Process Automation  
ABB India

ENGINEERED  
TO OUTRUN

# CHEM & PETCHEM Project Challenges

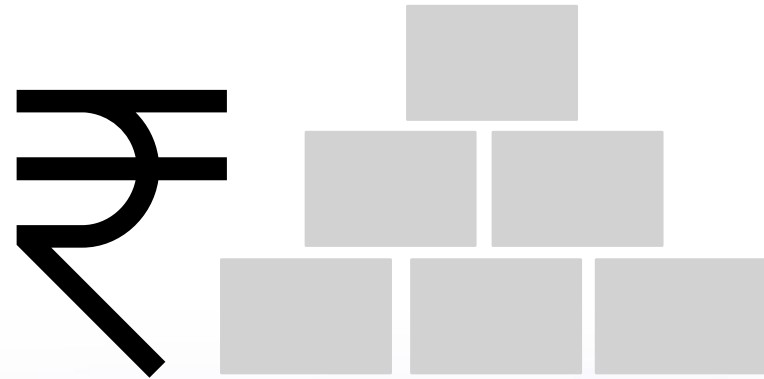
Minimize

Schedule



Minimize

Investment

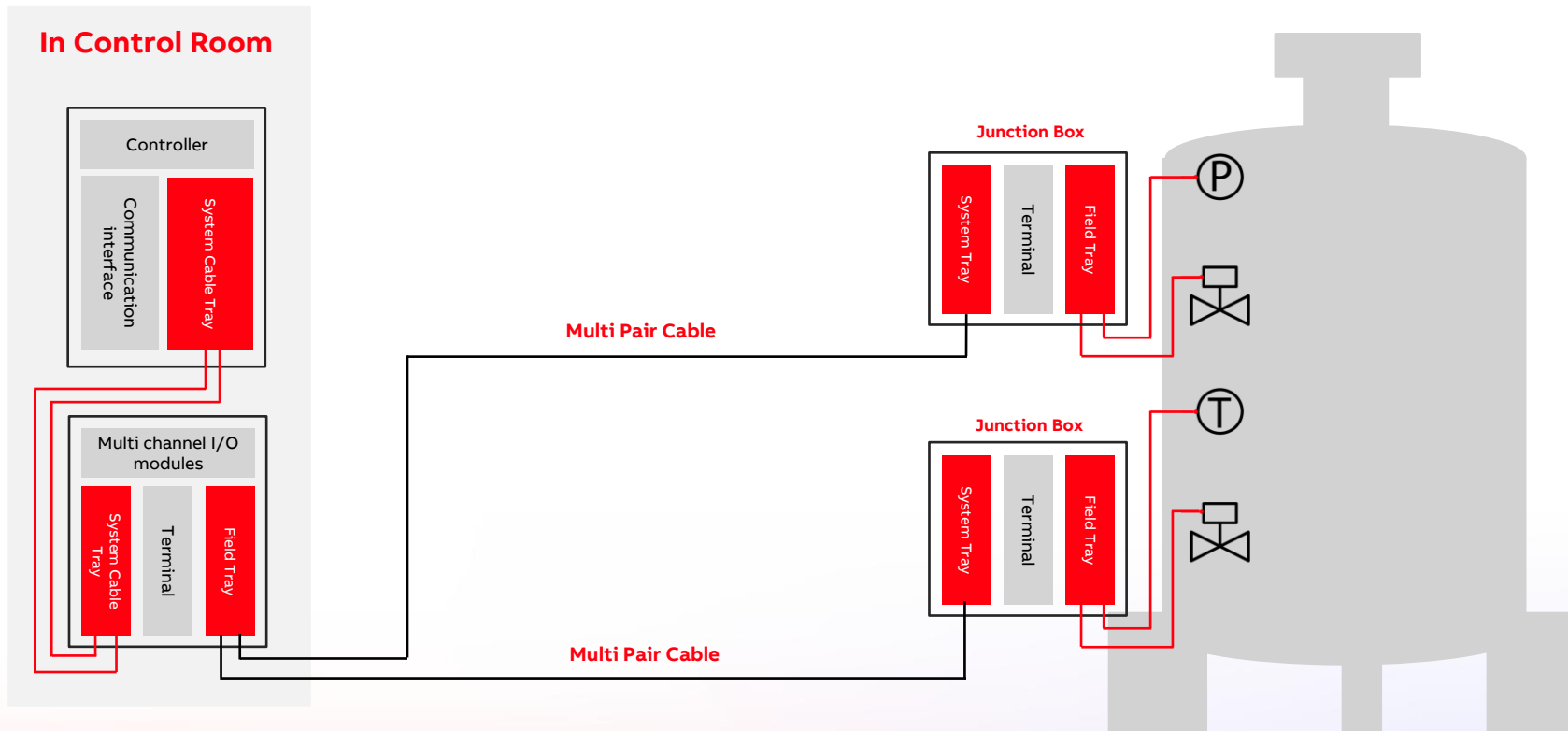


**O1**

**IN FIELD  
REMOTE I/OS**

# Traditional Approach

## I/O Marshalling in Control Room

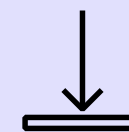
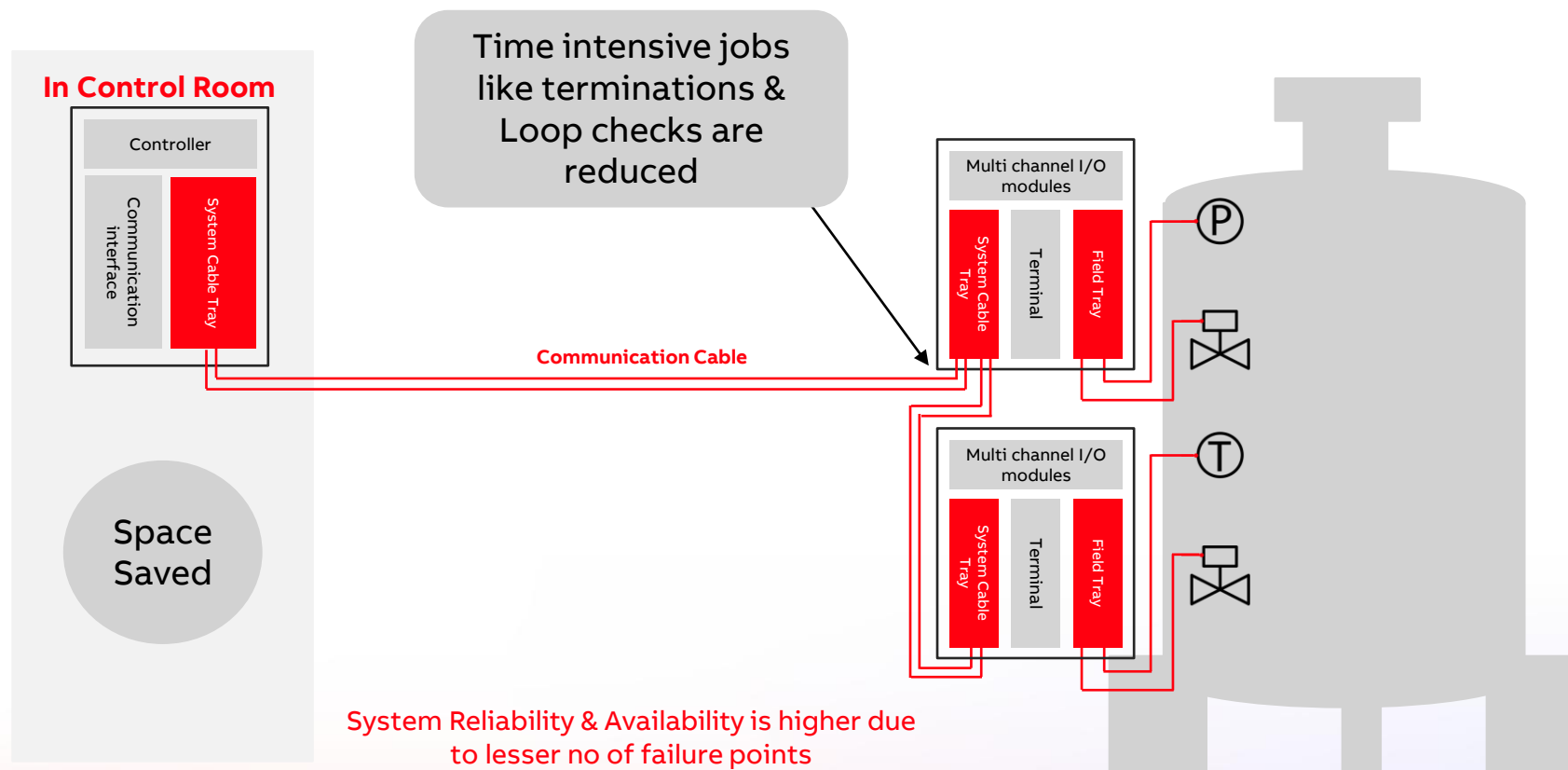


Changes Necessitate More Investment and Time

- Traditional Marshalling architecture is rigid
- Field wiring schedule drives need for marshalling cabinets
  - Costly late changes are inevitable
  - Dependencies drive a 'sequence' approach.
  - Updates to OEM equipment
  - Capacity balancing / partitioning
  - New equipment being added
  - Signal type changes
- Traditional I/O design creates dependencies
- Late changes create costly change orders

# Remote Marshalling

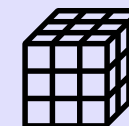
## I/Os in Field



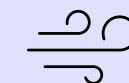
Reduces Cable, cable trays, Junction Box, Erection activity



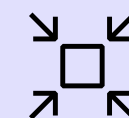
Quicker installation & commissioning schedule



Scalable & Modular



Late changes can be accommodated without impact

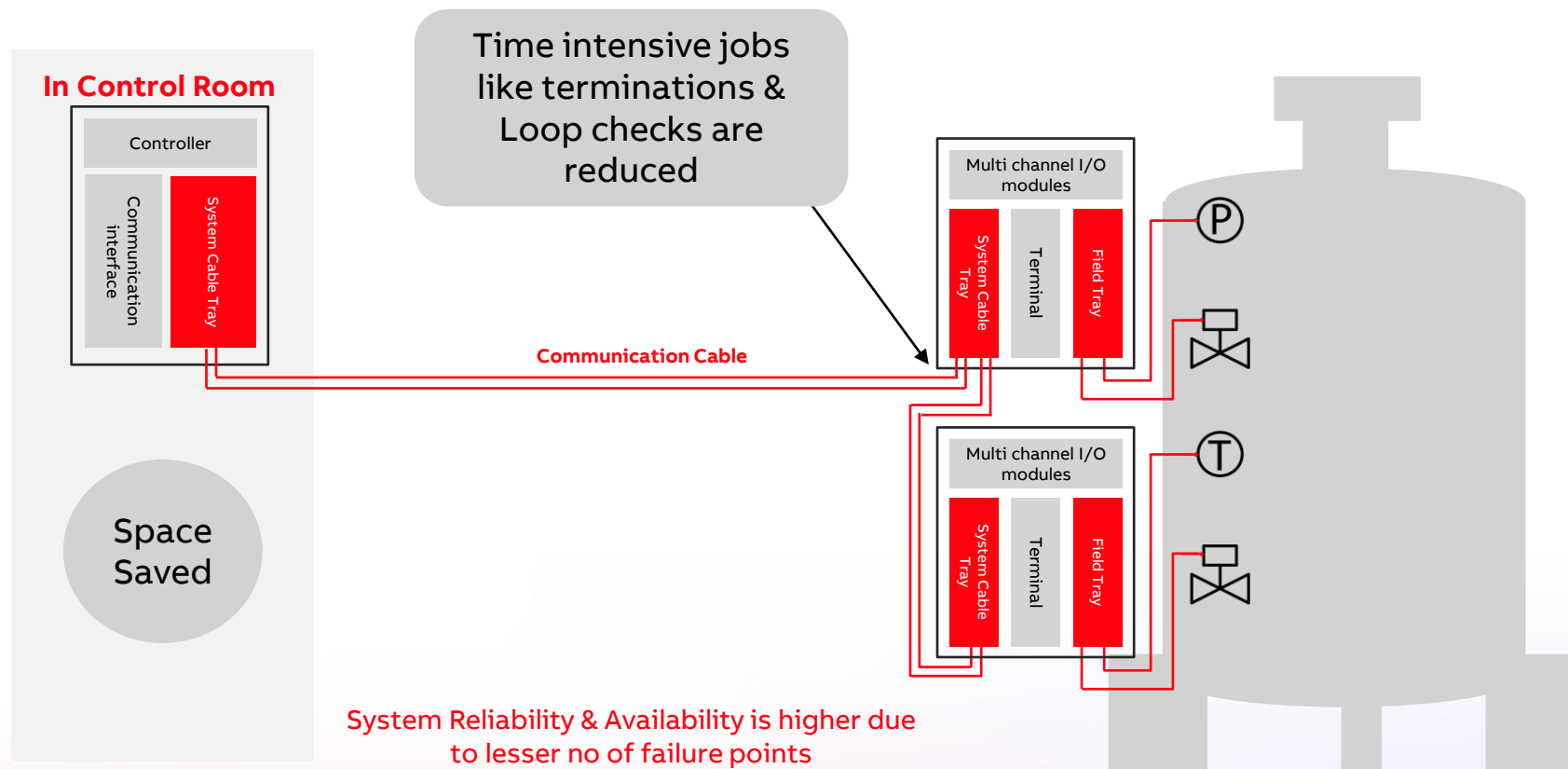


Smaller Footprint

Tailored Fit to meet the Dynamic Demands of Chemical Industry

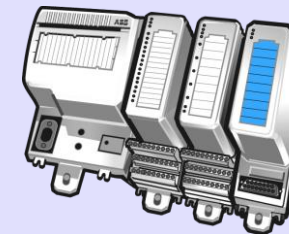
# Remote Marshalling

## I/Os in Field

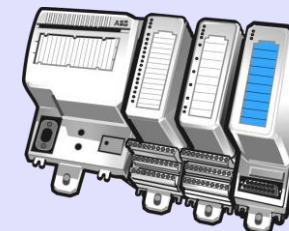


Tailored Fit to meet the Dynamic Demands of Chemical Industry

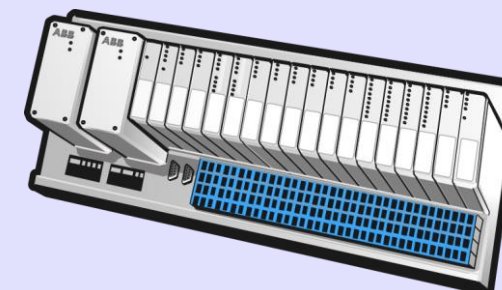
- **Safe Area**  
S800 I/O series



- **Zone-II Area**  
S800 I/O series



- **Zone-I Area**  
S900 I/O series



## ABB's Remote I/O footprint (Partial) 12 Lakh + I/Os

Enabling lean project execution schedule

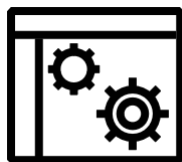


# Make Your Projects & Operations Smarter

Utilize ABB Remote I/Os solutions



Plug & Play engineering & commissioning



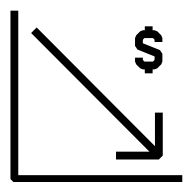
No additional configuration or math blocks



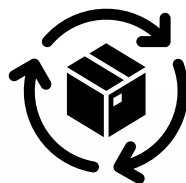
I/O channel level integrated diagnostic



Ease of maintenance



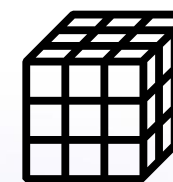
Lowest Total Cost of Ownership



Best In Class & Longest Lifecycle



Integrated HART Management



Flexible & Scalable



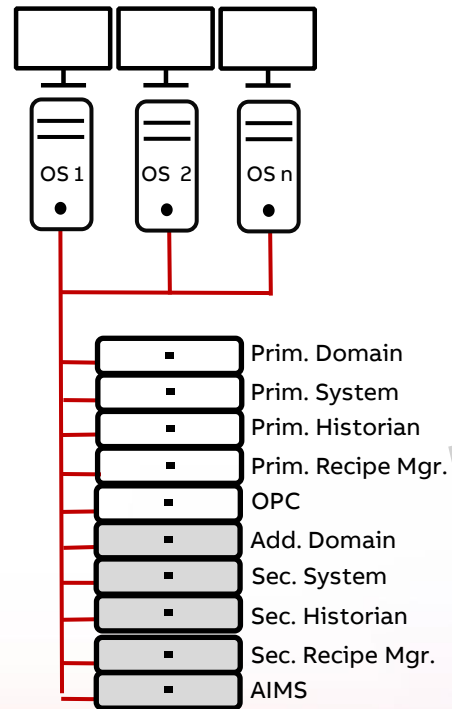
02

# IT HARDWARE: VIRTUALIZATION

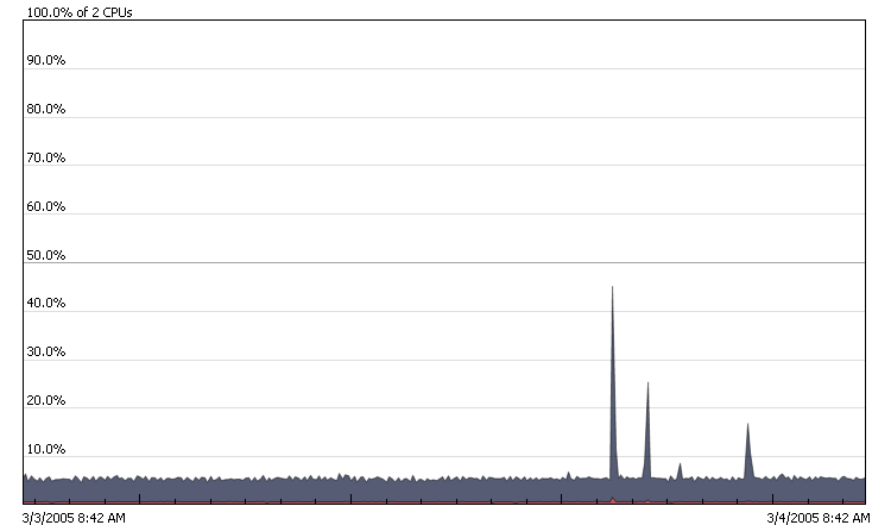
# ABB Ability™ System 800xA Virtualization

Leveraging IT for enhanced Productivity and Profitability

Traditional architecture



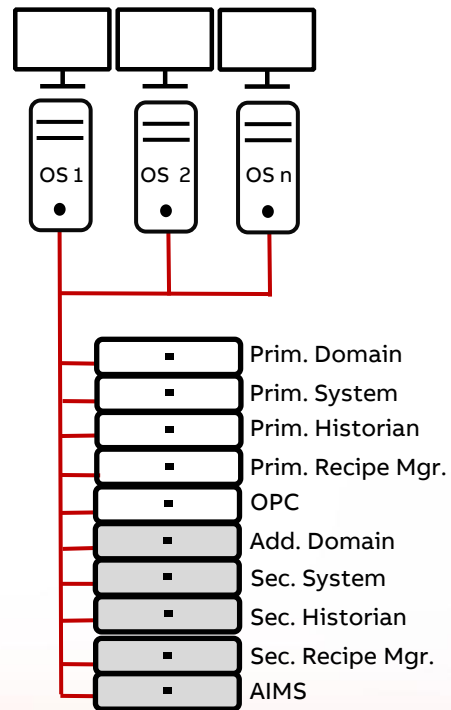
CPU Utilization



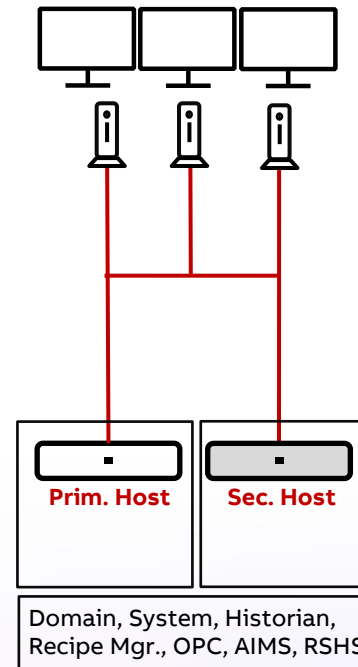
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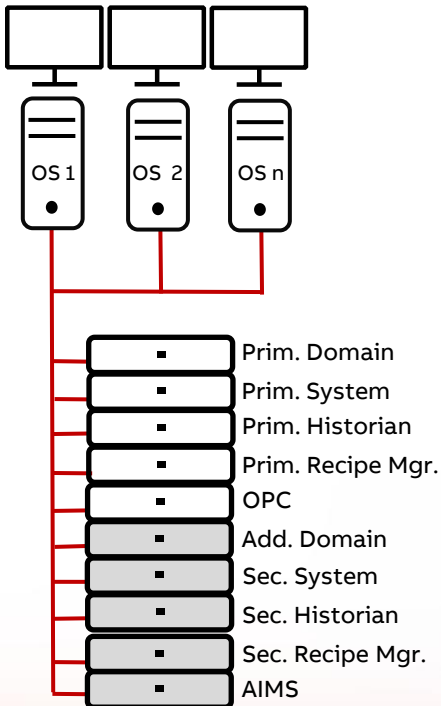
Virtualized architecture



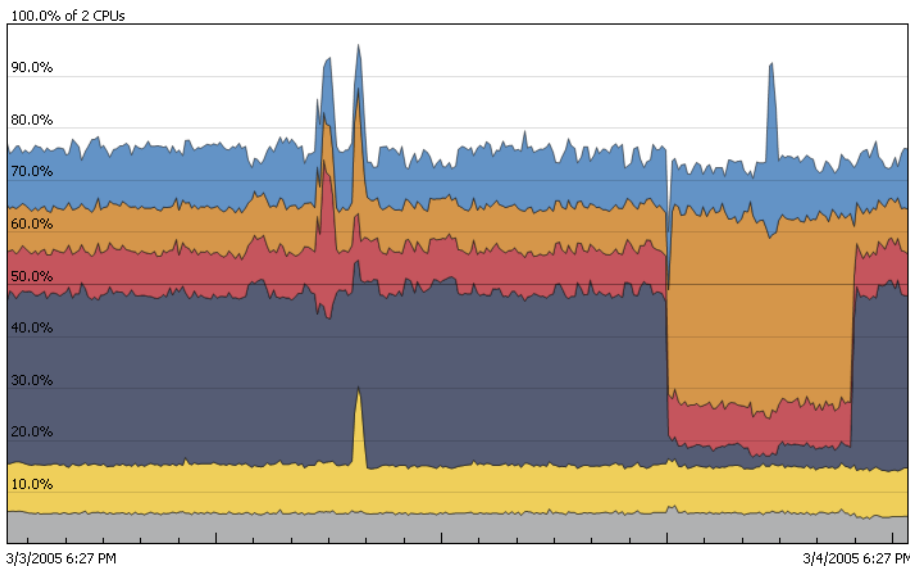
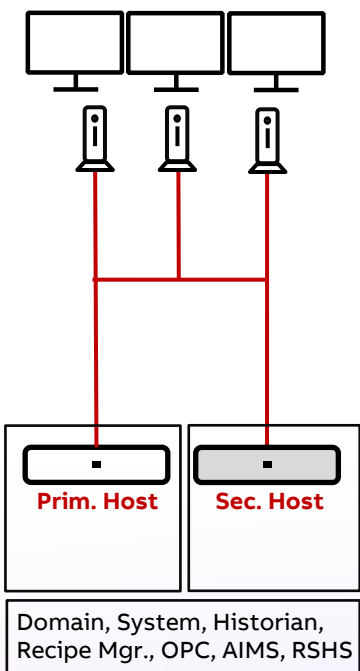
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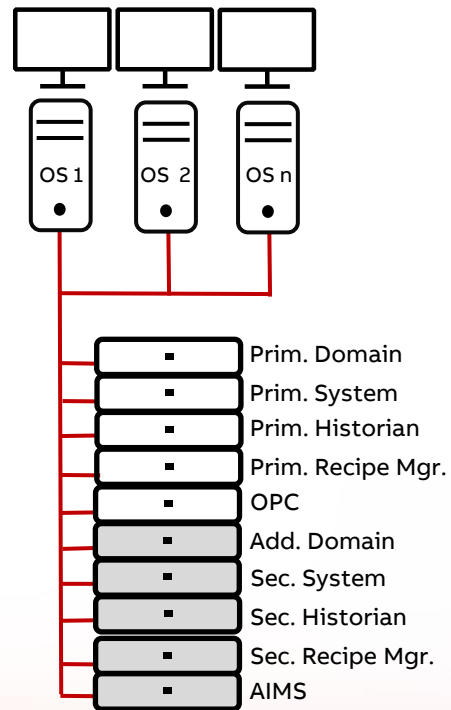
Virtualized architecture



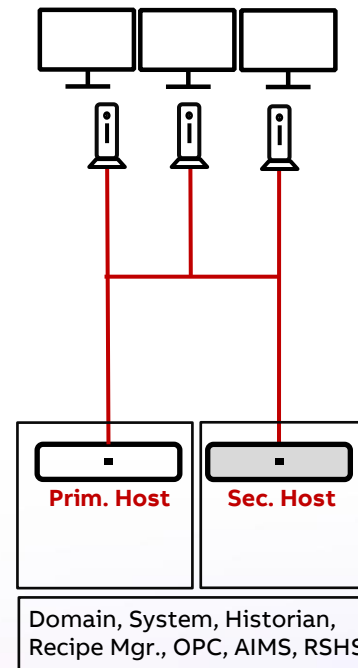
# ABB Ability™ System 800xA Virtualization

Leveraging IT for enhanced Productivity and Profitability

Traditional architecture



Virtualized architecture



Future Proof



Energy Efficient



Cost Saving



Flexibility and Scalability



Servers & Clients virtualization



Freedom to choose IT assets



Cyber Security

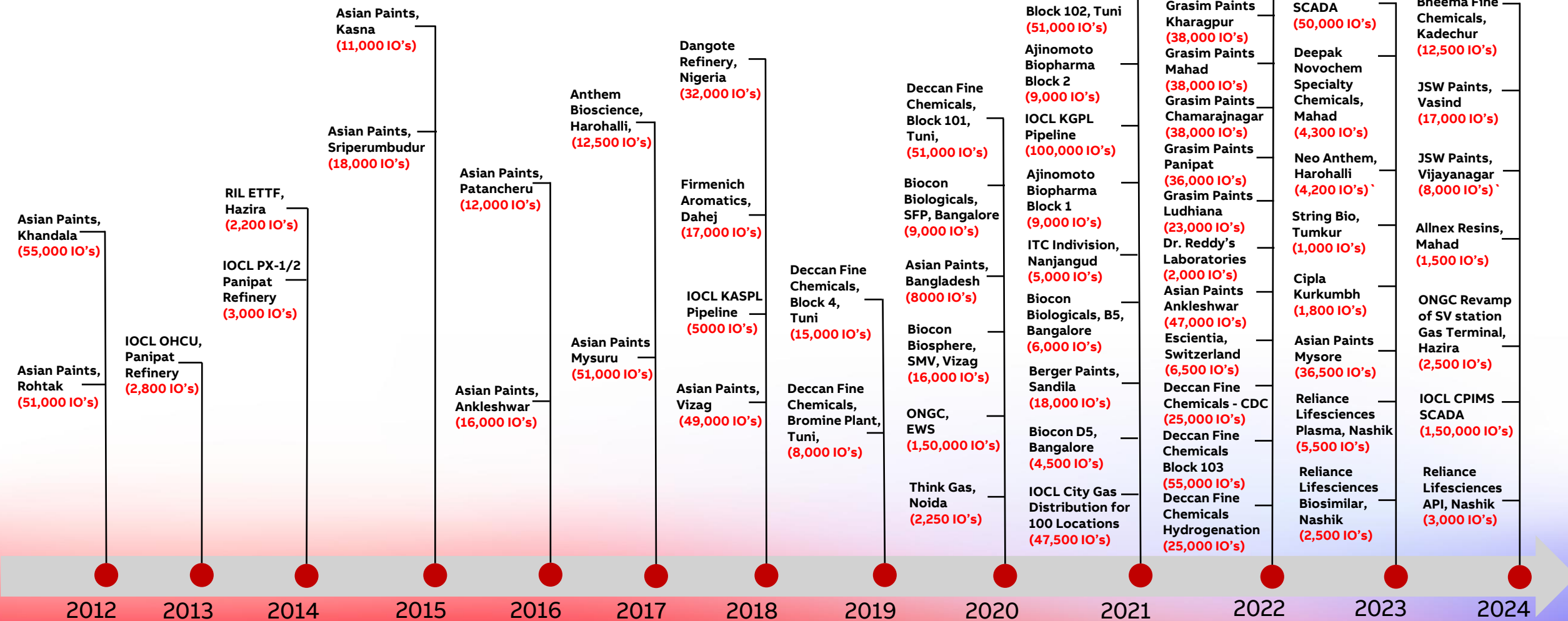


Customer Value



# ABB India Virtualization Experience

## 15 Lakh+ I/Os delivered On Virtualized Systems



03

# **OPERATIONAL PHILOSOPHY**

# Doing more with Less - Exception based Operations

Single Plant – Single Operator

Process Phase

10-02-2021 16:04:17

XV\_31QT01\_40

InterlockActive

Level lock

System

ABB

10-02-2021 16:03:46

XV\_25Q12\_H03\_27

ObjErr

BothFB

10-02-2021 16:06

6

Block Summary

Product: C

SLF

DPEP

DEDS

CVPMS

Utility

SCRUBBER

Alarm Overview

SIS

System

Tanks Data

DTF

ACT

10/02/2021 15:44:58:050

R25N11Utility\_TC

Valve Object Error

Phase\_On\_Hold

ACT

10/02/2021 15:37:39:467

ST\_ONT02

Phase on Hold-Pump Object Error

Phase\_On\_Hold

ACT

10/02/2021 15:23:15:049

ST\_OPT39

Phase on Hold-Pump Object Error

Phase\_On\_Hold

ACT

10/02/2021 14:20:15:224

R19Q12Utility\_TC

Valve Object Error

Phase\_On\_Hold

ACT

10/02/2021 13:53:27:098

ST\_ONT04

Phase on Hold-Valve Object Error

Phase\_On\_Hold

ACT

10/02/2021 12:56:23:535

ST\_OPT12

Phase on Hold-Pump Object Error

Phase\_On\_Hold

ACT

10/02/2021 12:44:43:901

ST\_ONT12

Phase on Hold-Pump Object Error

Phase\_On\_Hold

ACT

10/02/2021 12:44:28:602

ST\_OOT01

Phase on Hold-Pump Object Error

Phase\_On\_Hold

ACT

10/02/2021 12:44:23:501

ST\_ONT37

Phase on Hold-Pump Object Error

Phase\_On\_Hold

ACT

10/02/2021 12:00:01:400

R19011Tank\_To\_Tank\_Transfer

Destination Fault

Phase\_On\_Hold

ACT

10/02/2021 11:57:45:686

ST\_OPT40

Phase on Hold-Pump Object Error

Phase\_On\_Hold

ACT

10/02/2021 10:52:15:151

R25N12Phase\_Speration\_R1

Valve Object Error

Phase\_On\_Hold

ACT

10/02/2021 10:44:21:737

R25P12RM\_Addition\_1

Agitator Fault

Phase\_On\_Hold

ACT

10/02/2021 10:09:24:737

QQT03 Tank Level High

QQT03 High Level Sensor

LSH\_QQT03\_30

Acted

401

ACT

10/02/2021 07:56:21:735

High

31PT05 Level

LIT\_31PT05\_30

AlAlarm

400

ACT

09/02/2021 19:43:19:636

HighHigh

QQT03 Level

LIT\_QQT03\_30

AlFault

400

ACT

09/02/2021 19:43:09:736

High

QQT03 Level

LIT\_QQT03\_30

AlAlarm

400

ACT

09/02/2021 12:53:01:829

High

7NT02 Tank Level

LIT\_7NT02\_30

AlAlarm

400

ACT

28/01/2021 12:28:42:136

QQT26 Tank Level High

QQT26 High Level Sensor

LSH\_QQT26\_30

Acted

401

ACT

20/01/2021 15:29:56:419

7012 Vent Pot Level High

7012 High Level Sensor

LSH\_7012\_VT01\_30

Acted

401





# Doing more with Less - Exception based Operations

Single Plant – Single Operator

Process	Phase	10-02-2021 16:04:17	XV_31QT01_40	InterlockActive	Level lock	System	ABB
25	5	10-02-2021 16:03:46	XV_25Q12_H03_27	ObjErr	BothFB	10-02-2021 16:06	6
Block Summary   Product: C   SLF: 0   DPEP: 0   DECS: 0   CVPMS: 2   Utility: 1   SCRUBBER: 1   Alarm Overview   SIS: 0   System:   Tanks Data: 9   DTF:							
ACT	10/02/2021 15:44:58:050	R25N11Utility_TC	Valve Object Error	Phase_On_Hold			
ACT	10/02/2021 15:37:39:467	ST_ONT02	Phase on Hold-Pump Object Error	Phase_On_Hold			
ACT	10/02/2021 15:23:15:049	ST_0PT39	Phase on Hold-Pump Object Error	Phase_On_Hold			
ACT	10/02/2021 14:20:15:224	R19Q12Utility_TC	Valve Object Error	Phase_On_Hold			
ACT	10/02/2021 13:53:27:098	ST_ONT04	Phase on Hold-Valve Object Error	Phase_On_Hold			
ACT	10/02/2021 12:56:23:535	ST_0PT12	Phase on Hold-Pump Object Error	Phase_On_Hold			
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ACT	10/02/2021 12:44:28:602	ST_0OT01	Phase on Hold-Pump Object Error	Phase_On_Hold			
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ACT	10/02/2021 12:00:01:400	R19Q11Tank_To_Tank_Transfer	Destination Fault	Phase_On_Hold			
ACT	10/02/2021 11:57:45:686	ST_0PT40	Phase on Hold-Pump Object Error	Phase_On_Hold			
ACT	10/02/2021 10:52:15:151	R25N12Phase_Speration_R1	Valve Object Error	Phase_On_Hold			
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ACT	10/02/2021 10:09:24:737	QQT03 Tank Level High	QQT03 High Level Sensor	LSH_QQT03_30	Acted	401	
ACT	10/02/2021 07:56:21:735	High	31PT05 Level	LIT_31PT05_30	AlAlarm	400	
ACT	09/02/2021 19:43:19:636	HighHigh	QQT03 Level	LIT_QQT03_30	AlFault	400	
ACT	09/02/2021 19:43:09:736	High	QQT03 Level	LIT_QQT03_30	AlAlarm	400	
ACT	09/02/2021 12:53:01:829	High	7NT02 Tank Level	LIT_7NT02_30	AlAlarm	400	
ACT	28/01/2021 12:28:42:136	QQT26 Tank Level High	QQT26 High Level Sensor	LSH_QQT26_30	Acted	401	
ACT	20/01/2021 15:29:56:419	7012 Vent Pot Level High	7012 High Level Sensor	LSH_7012_VT01_30	Acted	401	

# Doing more with Less - Exception based Operations

## Single Plant – Single Operator



Process

Phase

10-02-2021 16:04:17

XV\_31QT01\_40

InterlockActive

Level lock

System

ABB

10-02-2021 16:03:46

XV\_25Q12\_H03\_27

10-02-2021 16:03:46

XV\_0014\_U004\_30

ObjErr

InterlockActive

BothFB

BothFB

10-02-2021 16:06

6

Block Summary

Product: C

SLF

DEP

DEDS

CVPMS

Utility

SCRUBBER

Alarm Overview

SIS

System

Tanks Data

DTF

ACT	10/02/2021 15:44:58:050	R25N11Utility_TC	Valve Object Error	Phase_On_Hold
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ACT	10/02/2021 12:44:23:501	ST_ONT37	Phase on Hold-Pump Object Error	Phase_On_Hold
ACT	10/02/2021 12:00:01:400	R19Q11Tank_To_Tank_Transfer	Destination Fault	Phase_On_Hold
ACT	10/02/2021 11:57:45:686	ST_0PT40	Phase on Hold-Pump Object Error	Phase_On_Hold
ACT	10/02/2021 10:52:15:151	R25N12Phase_Speration_R1	Valve Object Error	Phase_On_Hold
ACT	10/02/2021 10:44:21:737	R25P12RM_Addition_1	Agitator Fault	Phase_On_Hold

0

ACT

10/02/2021 10:09:24:737

Q0T03 Tank Level High

Q0T03 High Level Sensor

LSR\_Q0T03\_30

Acted

401

0

ACT

10/02/2021 07:56:21:735

High

31PT05 Level

LIT\_31PT05\_30

AIAlarm

400

0

ACT

09/02/2021 19:43:19:636

HighHigh

Q0T03 Level

LIT\_Q0T03\_30

AIAlarm

400

0

ACT

09/02/2021 19:43:09:736

High

Q0T03 Level

LIT\_Q0T03\_30

AIAlarm

400

0

ACT

09/02/2021 12:53:01:829

High

7NT02 Tank Level

LIT\_7NT02\_30

AIAlarm

400

0

ACT

28/01/2021 12:28:42:136

Q0T26 Tank Level High

Q0T26 High Level Sensor

LSR\_Q0T26\_30

Acted

401

0

ACT

20/01/2021 15:29:56:419

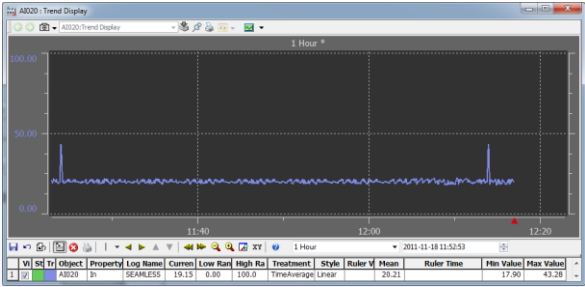
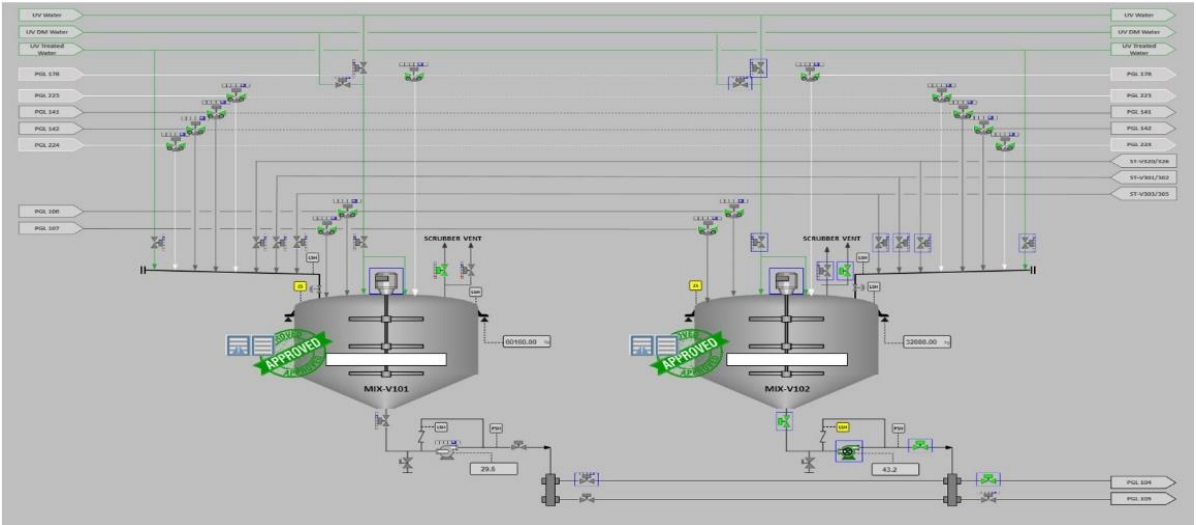
7012 Vent Pot Level High

7012 High Level Sensor

LSR\_7012\_VT01\_30

Acted

401



Alarm Instructions

Standard Operating Procedures

General Instructions

Alarm Level Description

Green

Green color means normal operation

No action is required

Blue

Blue color means a minor upset in the process

Alert must be acknowledged immediately

Please bring the process back to normal operation and observe any further changes

Yellow

Yellow color means an upset in the process that needs immediate action

Investigate to cause

Reduction of input or output or process parameters

Violations in the control loop must be aware of situation

Orange

Orange color means major upset in the process and danger for personnel

Escalate to level 3

Show red warning lighting to danger control room

Control room must be alerted

Red

Red color means process shutdown and evacuation is required

All personnel to evacuate to bring quarters

Further increased temperature for even more dangerous

Operator must immediately report to emergency services

Only authorized personnel are allowed in the control room



# Exception Based Operation

Single Plant – Single Operator



**Focused** - drawing attention to the most important issues.

**Relevant**- providing a non-spurious high-operational-value warning

**Unique**- not duplicating another alarm

**Timely** - occurring soon enough for an operator to respond effectively

**Prioritized** - indicating the priority an operator should give the alarm

**Understandable** -having a clear and easy-to-grasp message

**Diagnostic**- identifying the problem that has occurred

**Advisory** - giving an indication of the action required

When interruption in the normal process, operator needs support to shorten the time from the alarm occurring to finding the root cause and taking corrective action.

Process Phase 10-02-2021 16:04:17 XV\_31QT01\_40 InterlockActive Level Ilock 10-02-2021 16:06 XV\_29Q12\_H03\_27 ObjErr BothFB System 10-02-2021 16:06 ABB

Block Summary Product\_C SLF DFEP DEDS CVPMS Utility SCRUBBER Alarm Overview SIS System Tanks Data DTF

ACT	10/02/2021 15:44:58:050	R25N11Utility_TC	Valve Object Error	Phase_On_Hold
ACT	10/02/2021 15:37:39:467	ST_0NT02	Phase on Hold:Pump Object Error	Phase_On_Hold
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ACT	10/02/2021 12:44:23:501	ST_0NT37	Phase on Hold:Pump Object Error	Phase_On_Hold
ACT	10/02/2021 12:00:01:400	R19011Tank_To_Tank_Transfer	Destination Fault	Phase_On_Hold
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ACT	10/02/2021 10:52:15:151	R25N12Phase_Speration_R1	Valve Object Error	Phase_On_Hold
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ACT	10/02/2021 10:09:24:737	0QT03 Tank Level High	0QT03 High Level Sensor	LSH_0QT03_30	Acted	401
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ACT	20/01/2021 15:29:56:419	7012 Vent Pot Level High	7012 High Level Sensor	LSH_7012_VT01_30	Acted	401



# Exception Based System

Enhancing Process Operations – One Plant One Operator

## Highlights

- Exception based Operations successfully deployed since 2018
- Exception based Operations adopted at more than 20 large Process Plants in India
- Complex Processes with frequently changing recipes
- Critical processes involving many hazardous chemicals
- Ease of Operation with optimization of resources – Manpower & Space
- Ease of Maintenance & troubleshooting



**One Plant of >50,000 I/O's & > 150 Equipment = One Operator**

# ABB's Remote I/O footprint (Partial) +

Enabling lean project execution schedule





# Overcome project changes and complexity <sup>TM</sup>



By integrating expert capability, reliable infrastructure, emerging technologies and proven methodologies, **ABB** transforms capital projects with evolved approach to design, delivery and support throughout the entire project life cycle.

It's the missing link between project possibilities and project results:

CAPEX savings of

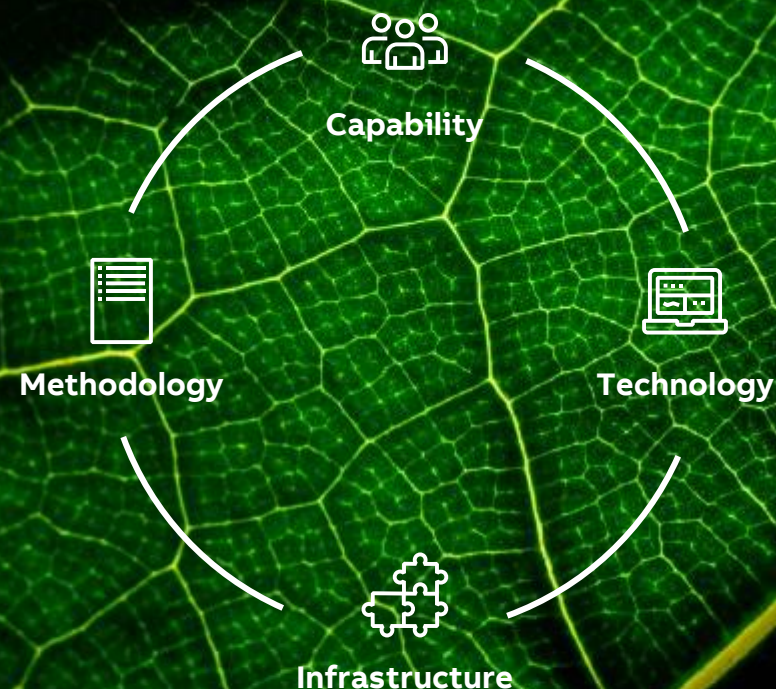
**15% to 40%**

Schedule compression of

**10% to 30%**

Reduce start-up hours by

**up to 40%**





# CONTACT

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☎ 8197783097

**AABB**