



AVEVAWORLD

# SCG Digital Reliability Platform

Comprehensive Asset Performance Management

REPCO NEX Industrial Solutions

AVEVA WORLD SAN FRANCISCO 2025



[www.repcoindustrialsolutions.com](http://www.repcoindustrialsolutions.com)



# Tutpol Ardsomang

Email: [tutpola@scg.com](mailto:tutpola@scg.com)

**Mr. Tutpol has been in SCGC for over 18 years.** Background is Instrument and Control Engineering, master in Reliability and Maintainability specialized in Prognostic. Current role is the lead of Predictive Analytic Solution for Manufacturing Industry.

## EXPERIENCES

- > 18 years in SCG chemicals in Asset Performance Management (APM) and Reliability Engineering
- > 10 years in AI Predictive Analytic Research & Development
- > 10 years in Instrument & Control system engineering
- > 5 years lead remote monitoring center

## EDUCATION & CERTIFICATION

- BS in Instrumentation Engineering from King Mongkut Institute of Technology Ladkrabang (KMITL)
- MS in Reliability and Maintainability Engineering from The University of Tennessee, Knoxville, USA
- Certified Maintenance & Reliability Professional (**CMRP**)
- Certified Reliability Engineer (**CRE**)
- Certified of Scrum Master (**CSM**)



Certified  
Reliability Engineer  
The Global Voice of Quality™



THE UNIVERSITY of  
**TENNESSEE**  
KNOXVILLE



- ❑ Introduction to SCG Digital Reliability Platform
- ❑ Predictive Analytics and Comprehensive Unified Health Management
- ❑ Operation Practice and Value Release



# About SCGC



SCG Chemicals or SCGC is **one of the largest integrated petrochemical companies in Asia** and a key industry leader. We manufacture and supply a **full range of petrochemical products ranging from upstream monomers to downstream polymers** including polyethylene, polypropylene, polyvinyl chloride and finished products.

To better serve customers' requirements, SCG assigns prime importance to the development of *new technology* and *innovation* for the creation of **high value-added products (HVA)** and **service solutions**.

A wide banner advertisement for SCGC. On the left, a woman kayaks on blue water, and a worker in an orange vest stands on a solar panel array. In the center, a woman in a white hard hat and apron holds a stack of white plastic containers next to a silver sports car. To the right of the car is a blue and white children's play structure with a child on a slide. Further right, a woman in a wheelchair is being assisted by a man in a white uniform. Next to them is a medical monitor on wheels, and on the far right, a man in a white lab coat stands next to a medical gurney. The background is a light green gradient with several white spheres of different sizes. The SCGC logo is in the top right corner.

นวัตกรรมเคมีภัณฑ์รอบตัว  
พัฒนาคุณภาพชีวิตรอบด้าน

INNOVATION THAT'S REAL

The SCGC logo, consisting of a stylized green and blue geometric icon to the left of the letters "SCGC" in bold blue font.



Maintenance and Reliability Engineering Service  
Plant Engineering and Construction Service (EPC , PMC)



Vietnam Office (RNV)



Flow  
Calibration



Mechanical Service



Chemicals  
Cleaning Service

“

TO BE THE **WORLD CLASS SERVICE** COMPANY  
WHO DELIVERS **INNOVATIVE INDUSTRIAL SOLUTIONS** IN **ASEAN**

”

Since 2001

## ABOUT US

We are **THE INNOVATIVE INDUSTRIAL SOLUTIONS PROVIDER** offering **ONE-STOP SERVICES** to our customers, from general maintenance to integrated solutions for various kinds of industry. With almost **40 YEARS EXPERIENCES** for more than **30 PLANTS** with over **5,000 CRITICAL ASSETS** as a solution practitioner in the petrochemicals industry, we bring our experiences to develop innovative solutions that will help you increase the utmost production efficiency and reliability of your production process.

*“ Your  
Trustworthy  
Industry  
Solutions  
Partner ”*

## To OUR CUSTOMER

- “* **Customer Success** is our primary goal
- “* **Exceptional Customer Satisfaction** is our service effort for sustaining long term relationship
- “* Tangible impact products & services **to empathize Customer's Pain Points** are professionally delivered with proven engineering facts and our 30 years' practical expertise

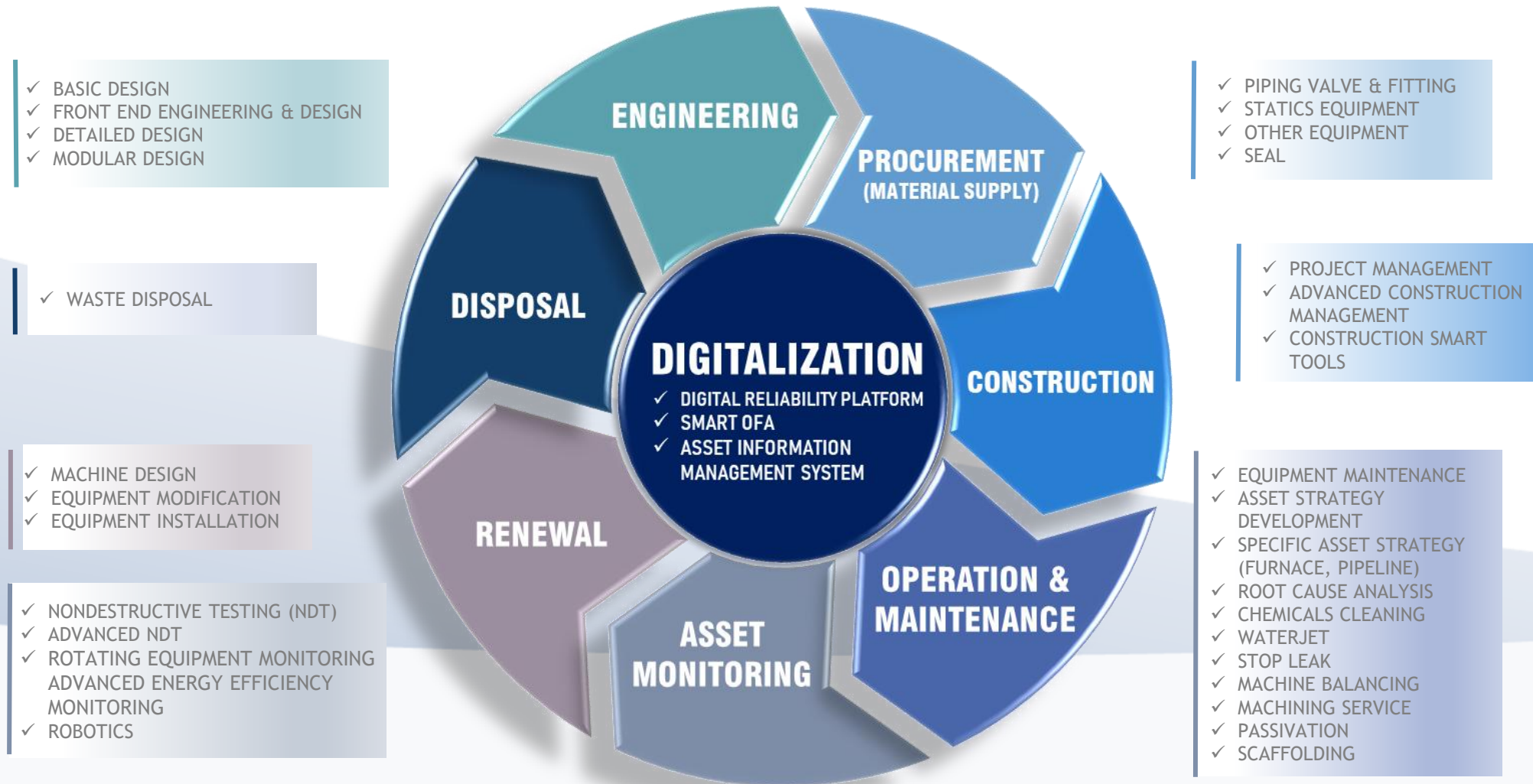




# ASSET PERFORMANCE MANAGEMENT SOLUTIONS



Our solutions evolve based on Asset Life Cycle with Digital alignment to all of our solutions.

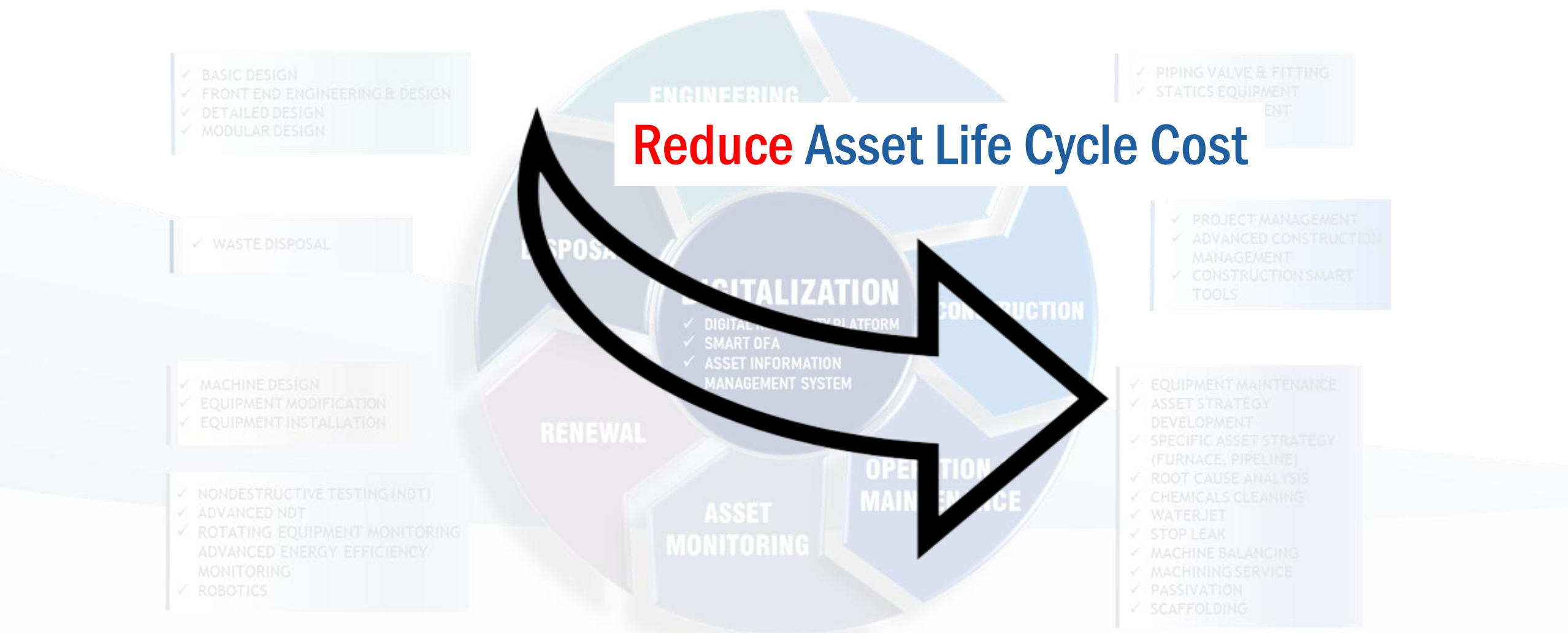




# ASSET PERFORMANCE MANAGEMENT SOLUTIONS



Our solutions evolve based on Asset Life Cycle with Digital alignment to all of our solutions.



# ASSET PERFORMANCE MANAGEMENT SOLUTIONS



For SCG Chemical - Petrochemical Industry



## Remote Monitoring Service

- > 10,000 Sensors
- > 100 Critical rotating machines
- > 1,000 Anomaly Detection Models
- Critical Instrument and Control
- Piping, Drum, Tank, Vessel



# Drive Business Competitiveness

Business requirement for Asset Performance Management



1. Safety	Zero incident
2.1 Uptime (%) (Downstream)	98.5% to 100%
2.2 Uptime (%) (Upstream)	100% (7 – 8 Years)
3. Maintenance Efficiency	40% improved
4. Work Capability	Ratio per Critical Equipment

From business's requirements turn into 500 lines of platform's function, which took two years of effort to search & try, then another two years to gain 9 MUSD in business benefit.

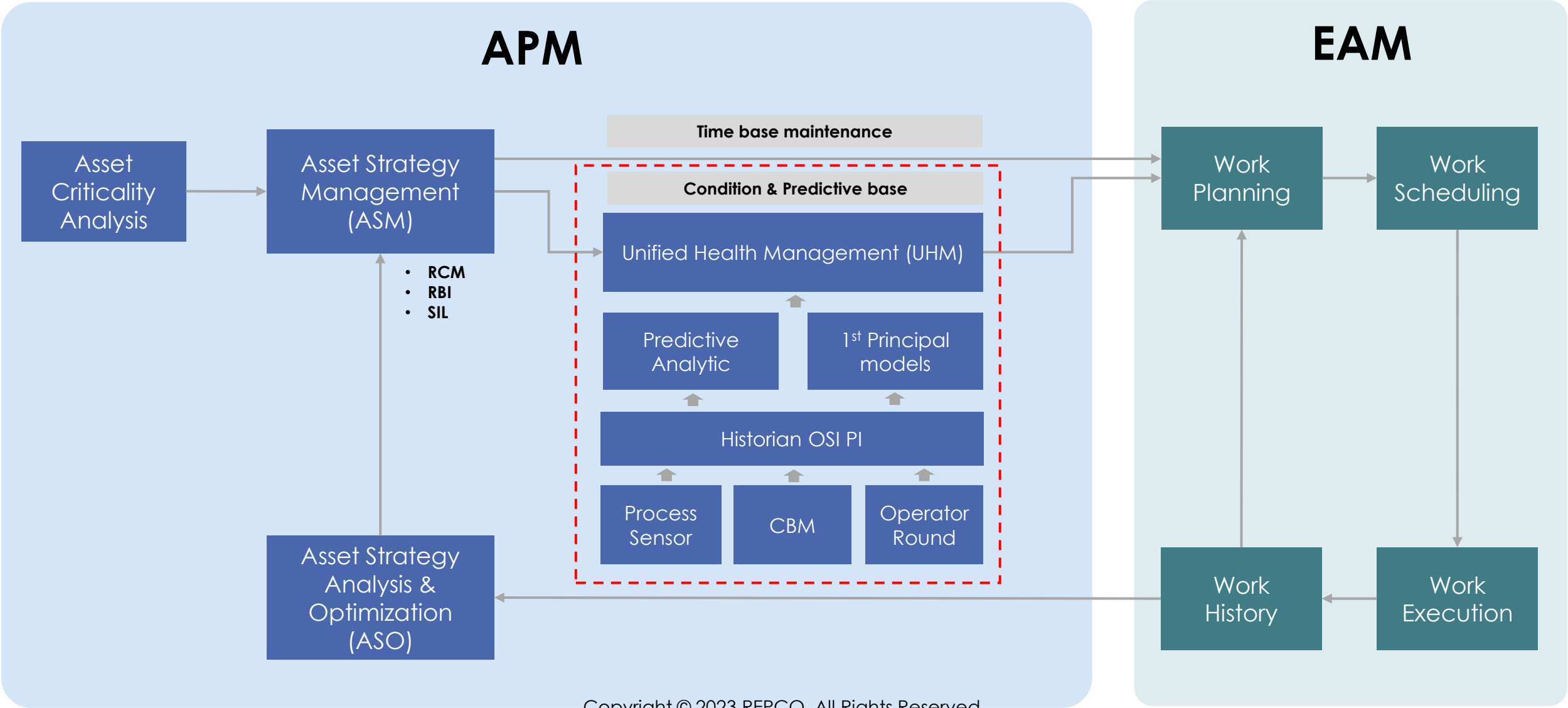
- ☒ Introduction to SCG Digital Reliability Platform
- ☐ Predictive Analytics and Comprehensive Unified Health Management
- ☐ Operation Practice and Value Release



# REPCO Asset Performance Management Framework

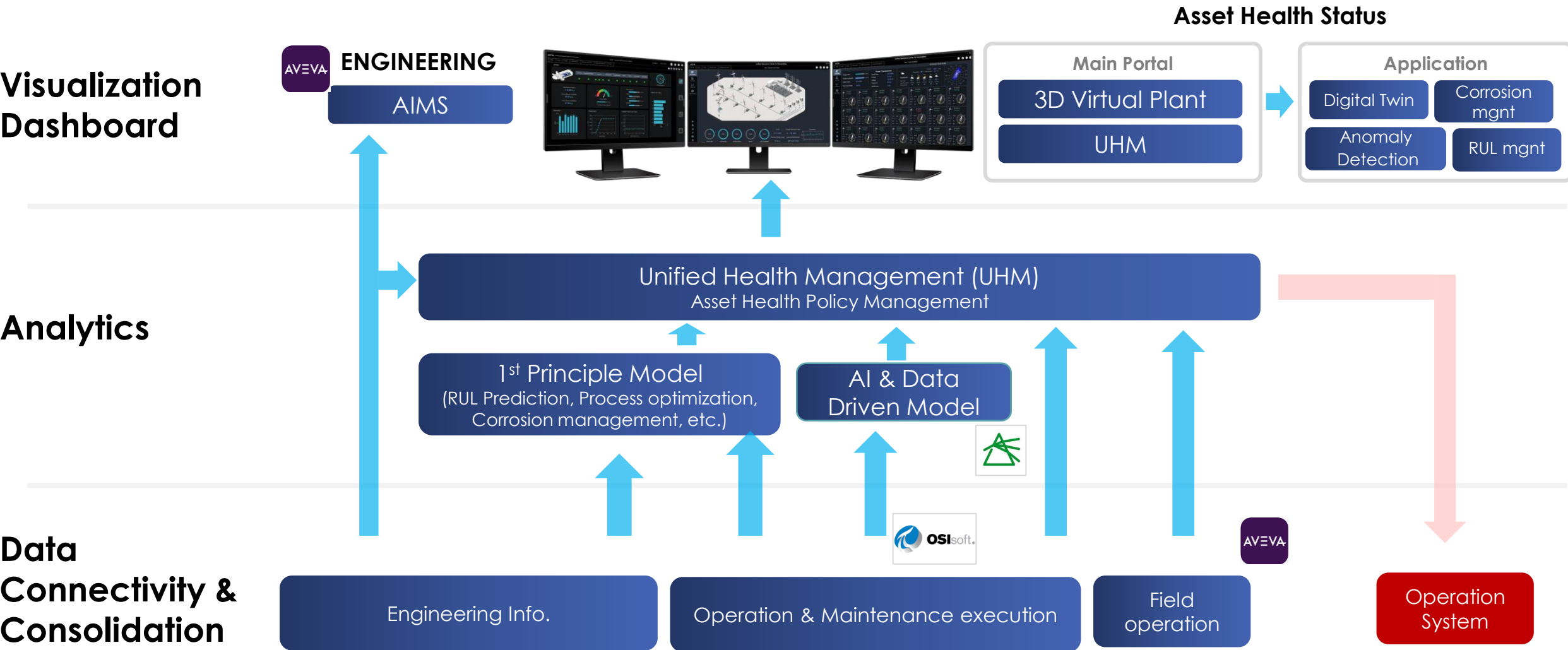
## Centralized Asset Performance Management





# UNIFIED OPERATION CENTER

## Centralized Asset Performance Monitoring







# REPCO NEX Digital Reliability Center (Unify Operation Center for Asset Digital Twin)





# COVERAGE INDUSTRIES

- **More than 30 Plants**
- **Cover Thailand, Vietnam & Indonesia**
- **> 1,000 AI to cover critical equipment**
- **Up to 40% productivity improvement**
- **More than 9 MUS Saving in Digital Journey**

## Power Industry



## Food & Beverage Industry

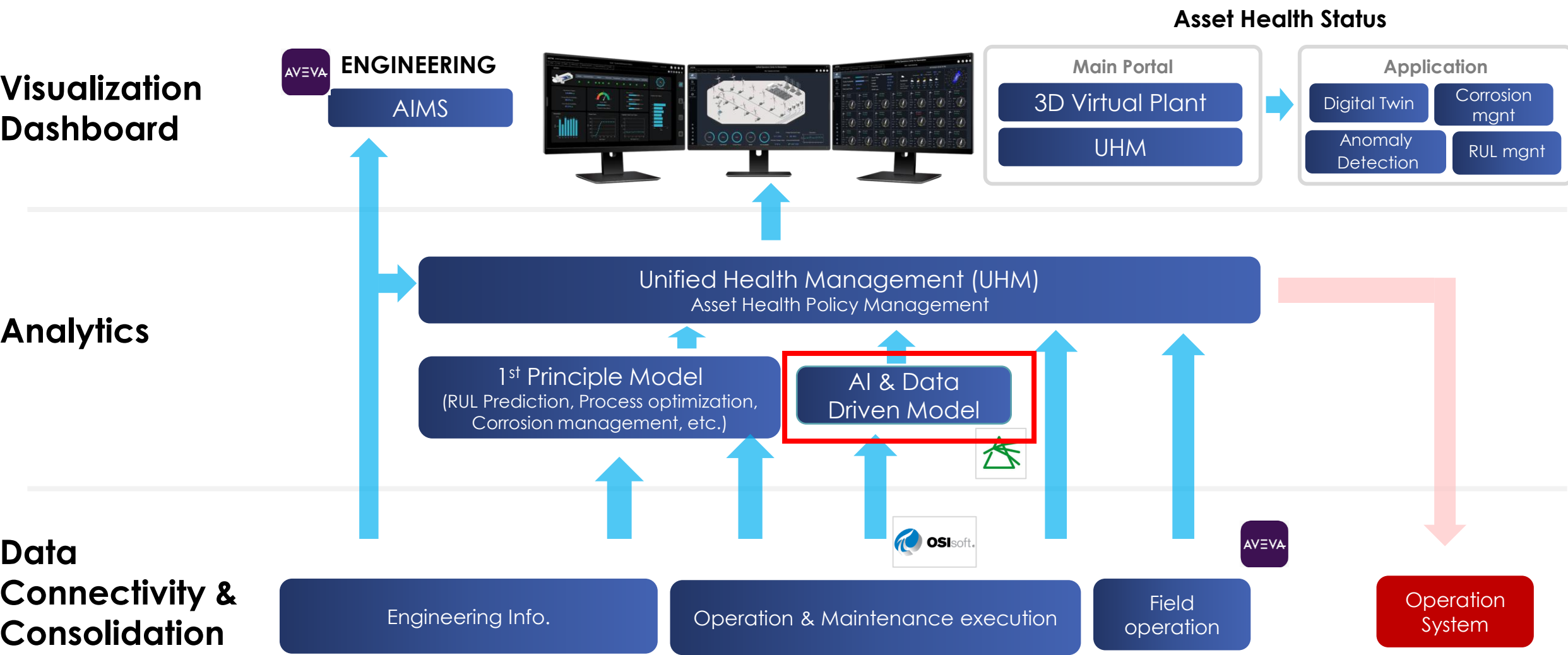




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# UNIFIED OPERATION CENTER

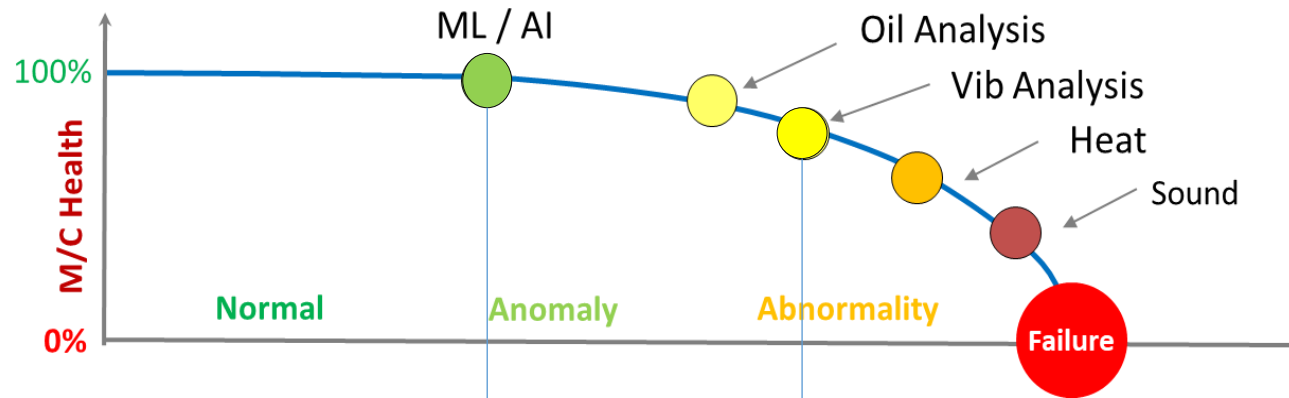
Centralized Asset Performance Monitoring



# Asset Performance Management (APM)

Predictive Analytic for Predictive Maintenance

## Why AI is more powerful than traditional alarm?

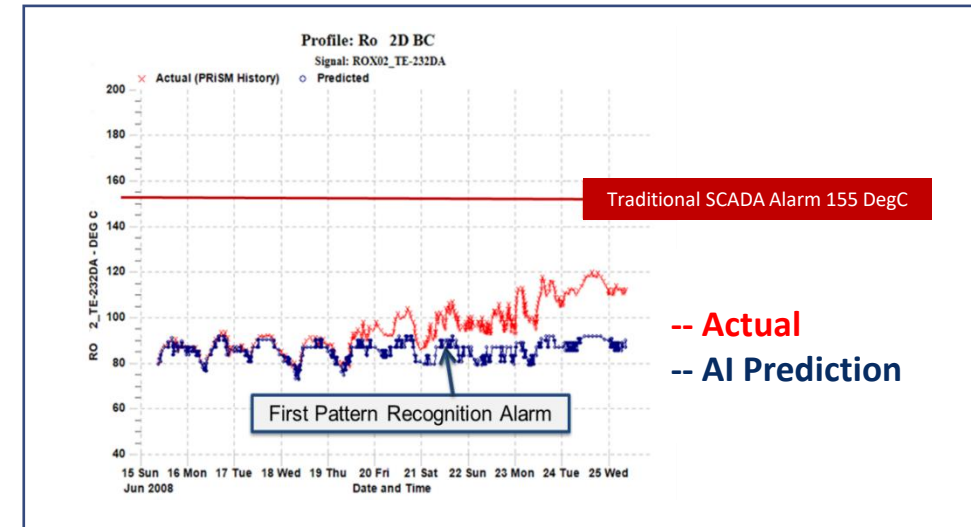


### Operating condition + Vibration

- Detect **early sign of defect**
- **Dynamic alarm** threshold regarding operating condition
- Automatic execution
- \* Use for Tricking domain expert to perform detail analysis

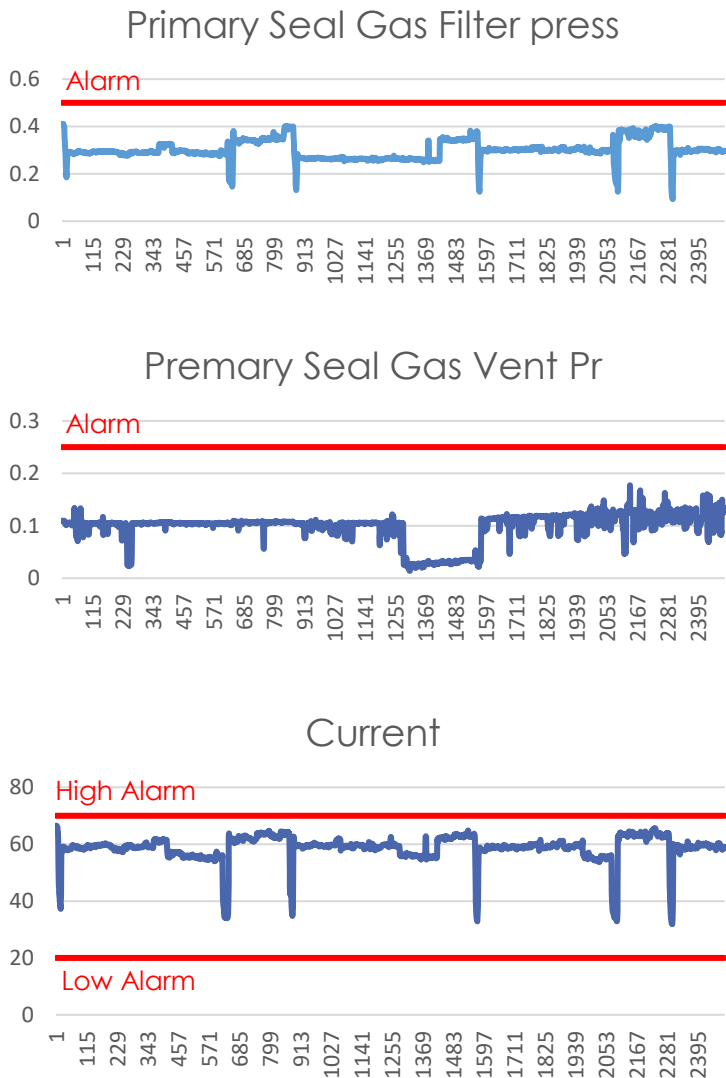
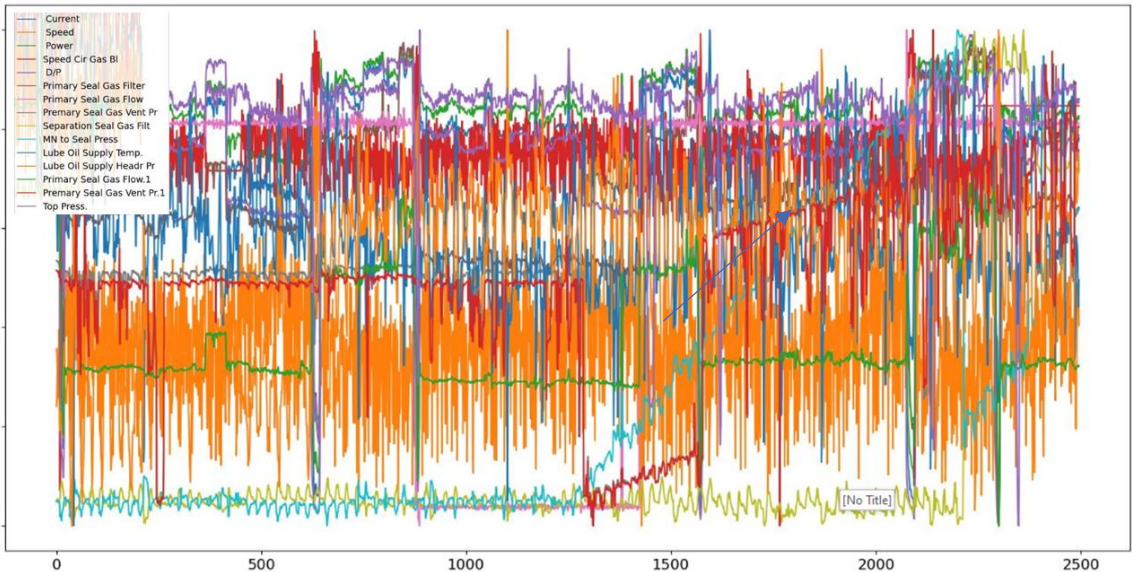
### Vibration & Individual parameter alarm Threshold

- Diagnose **existing defect** (Defect already occur)
- **Fix alarm** threshold regardless of operating condition
- Need human to interact



# Asset Performance Management (APM)

## □ Predictive Analytic - Anomaly Detection



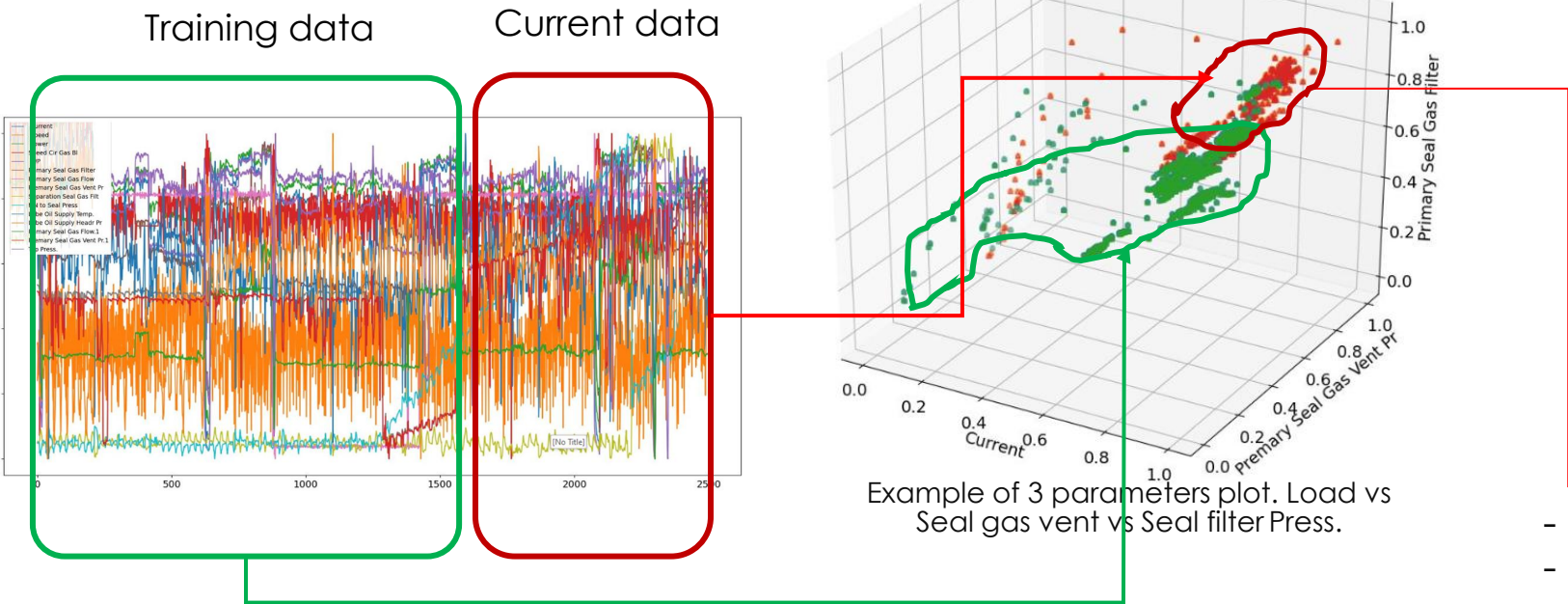


# Asset Performance Management (APM)

## Predictive Analytic - Anomaly Detection

“Better Combine Domain Knowledge to give diagnostic and prescription ”

### Diagnostic Template



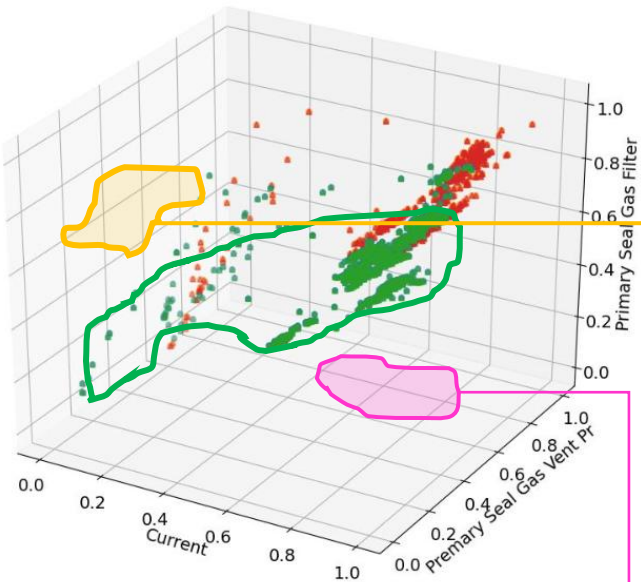
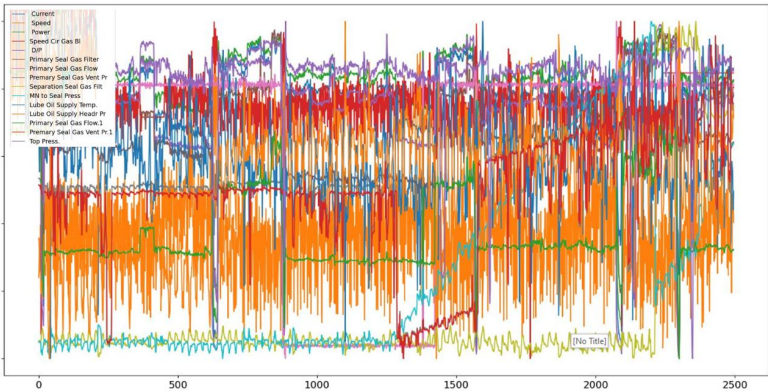
DEMO_GAS BLOWER DRY GAS SEAL SYST		BLOCKAGE IN SEAL GAS SYS ISSUE		Priority Weighting		1ST SG ISSUE FROM FILTER CLOG		Priority Weighting		2ND SG ISSUE FROM F		Priority	
MOTOR CURRENT	-	1	-	1	-	1	-	1	-	1	-	1	-
MOTOR SPEED													
MOTOR LOAD													
GAS BLWR SHAFT SPEED													
GAS BLWR DP													
PRIMARY SEAL GAS FILTER DP													
PRIMARY SEAL GAS FLOW	-	1	↑	2									
PRIMARY SEAL GAS VENT PRESS 1	↑	2											
SECONDARY SEAL GAS FILTER DP													
SECONDARY SEAL SUPPLY PRESS	↑	2											
LUBE OIL TEMP AFTER COOLER													
LUBE OIL SUPPLY PRESS													
PRIMARY SEAL GAS FLOW %MV													
PRIMARY SEAL GAS VENT PRESS 2	↑	2											

- Diagnostic: Potential cause of problem
- Prescription: How to handle it

# Asset Performance Management (APM)

## Predictive Analytic - Anomaly Detection

### Diagnostic Template



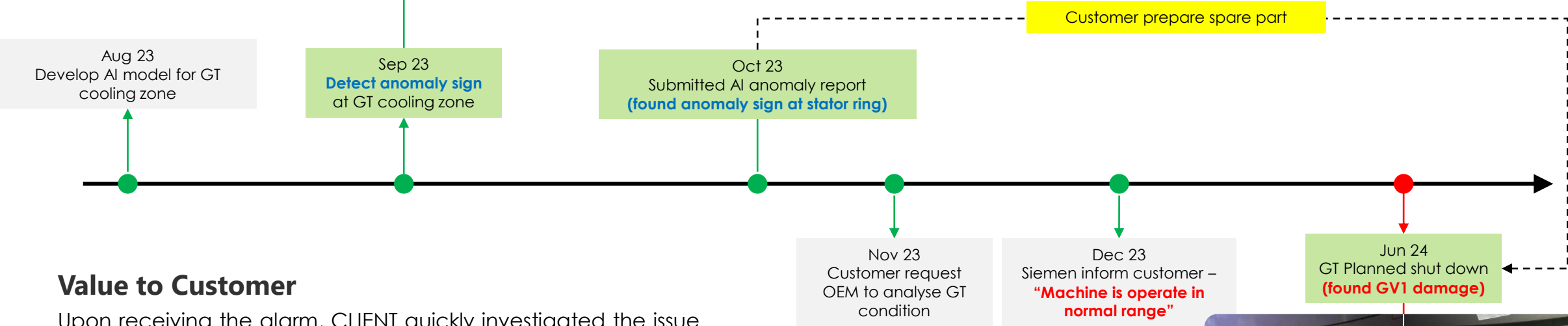
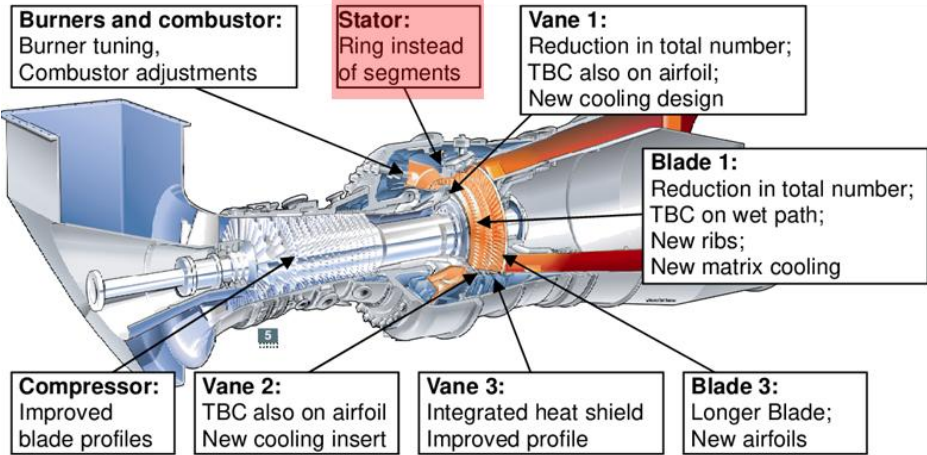
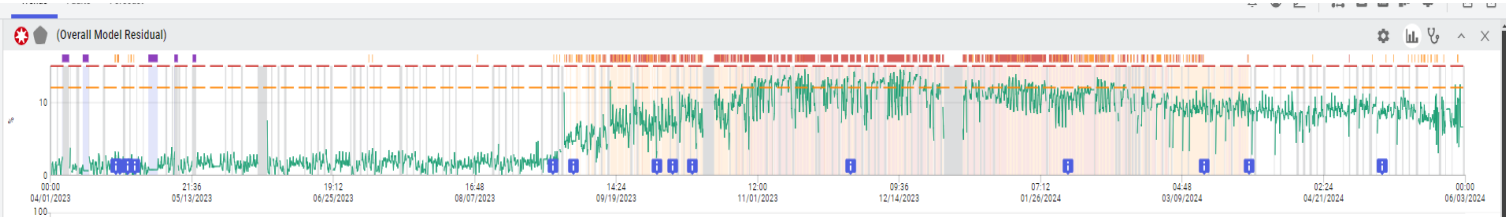
“Example of 3 parameters”

DEMO_GAS BLOWER DRY GAS SEAL SYST	BLOCKAGE IN SEAL				GAS SYS ISSUE			
	Priority		Weighting		Priority		Weighting	
	1ST SG ISSUE		FROM FILTER CLOG		2ND SG ISSUE		FROM F	
	Priority	Weighting	Priority	Weighting	Priority	Weighting	Priority	Weighting
MOTOR CURRENT	-	1	-	1	-	1	-	1
MOTOR SPEED								
MOTOR LOAD								
GAS BLWR SHAFT SPEED								
GAS BLWR DP								
PRIMARY SEAL GAS FILTER DP			↑	2			-	1
PRIMARY SEAL GAS FLOW	-	1	↓	2			↓	2
PRIMARY SEAL GAS VENT PRESS 1	↑	2						
SECONDARY SEAL GAS FILTER DP					↑	2		
SECONDARY SEAL SUPPLY PRESS	↑	2			↓	2		
LUBE OIL TEMP AFTER COOLER								
LUBE OIL SUPPLY PRESS								
PRIMARY SEAL GAS FLOW %MV			↑	2			↑	2
PRIMARY SEAL GAS VENT PRESS 2	↑	2						

Multiple failure modes can be prevent by 1 Machine learning model

# Example Success Case

## Gas Turbine Guide Vane Damaged



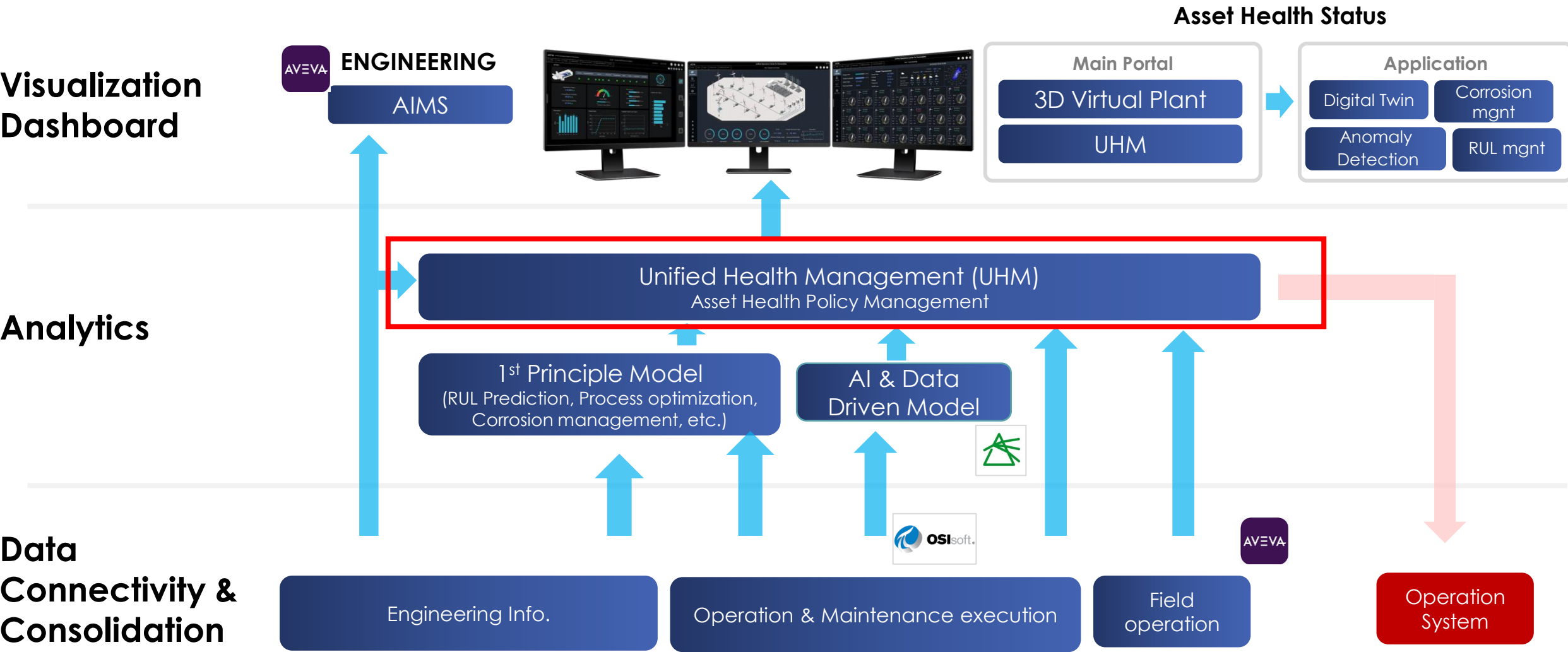
### Value to Customer

Upon receiving the alarm, CLIENT quickly investigated the issue and consulted with the Manufacturer. Simultaneously, they proactively prepared the necessary spare parts and a maintenance plan, ensuring minimal downtime and efficient replacement when the time came.



# UNIFIED OPERATION CENTER

Centralized Asset Performance Monitoring

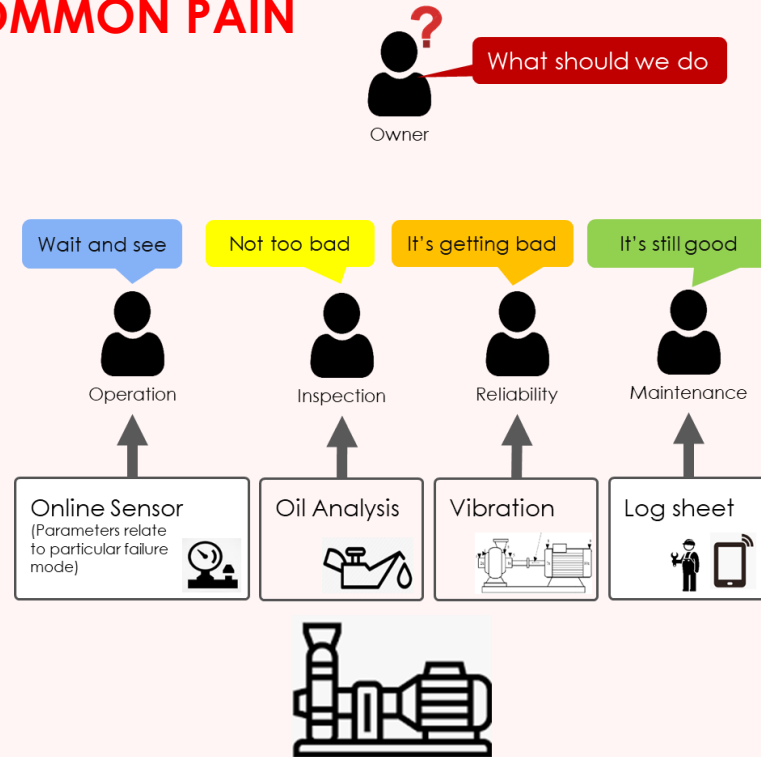




# UNIFIED HEALTH MANAGEMENT (UHM)

## Centralized Asset Health Management

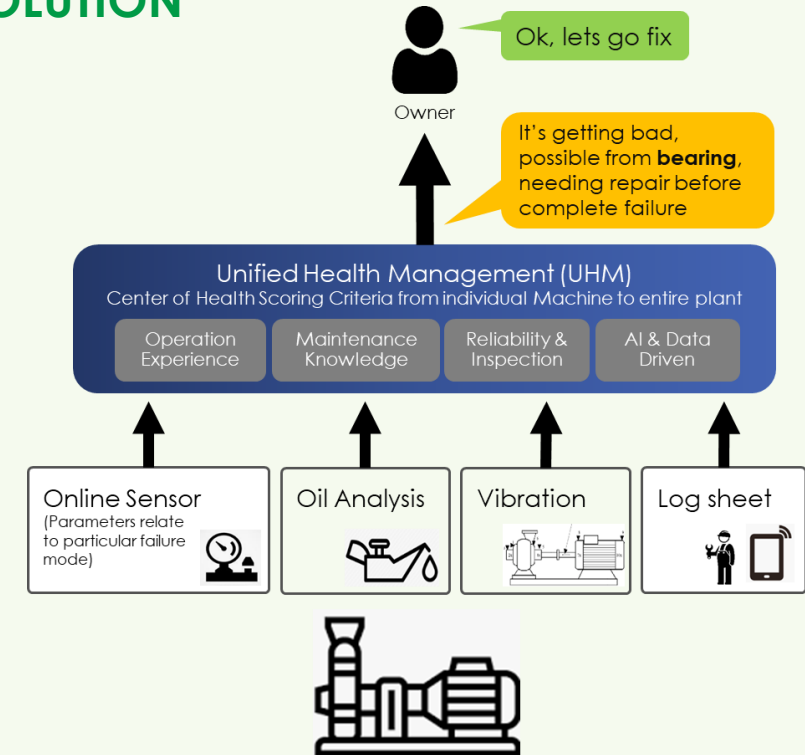
### COMMON PAIN



#### What is the pain point

- ❌ No single source of data
- ❌ Different team focus on different data
- ❌ Different team has different health criteria
- ❌ Difficulty to tracking source of problem
- ❌ Difficulty to control operating window

### SOLUTION



#### Pain point alleviation

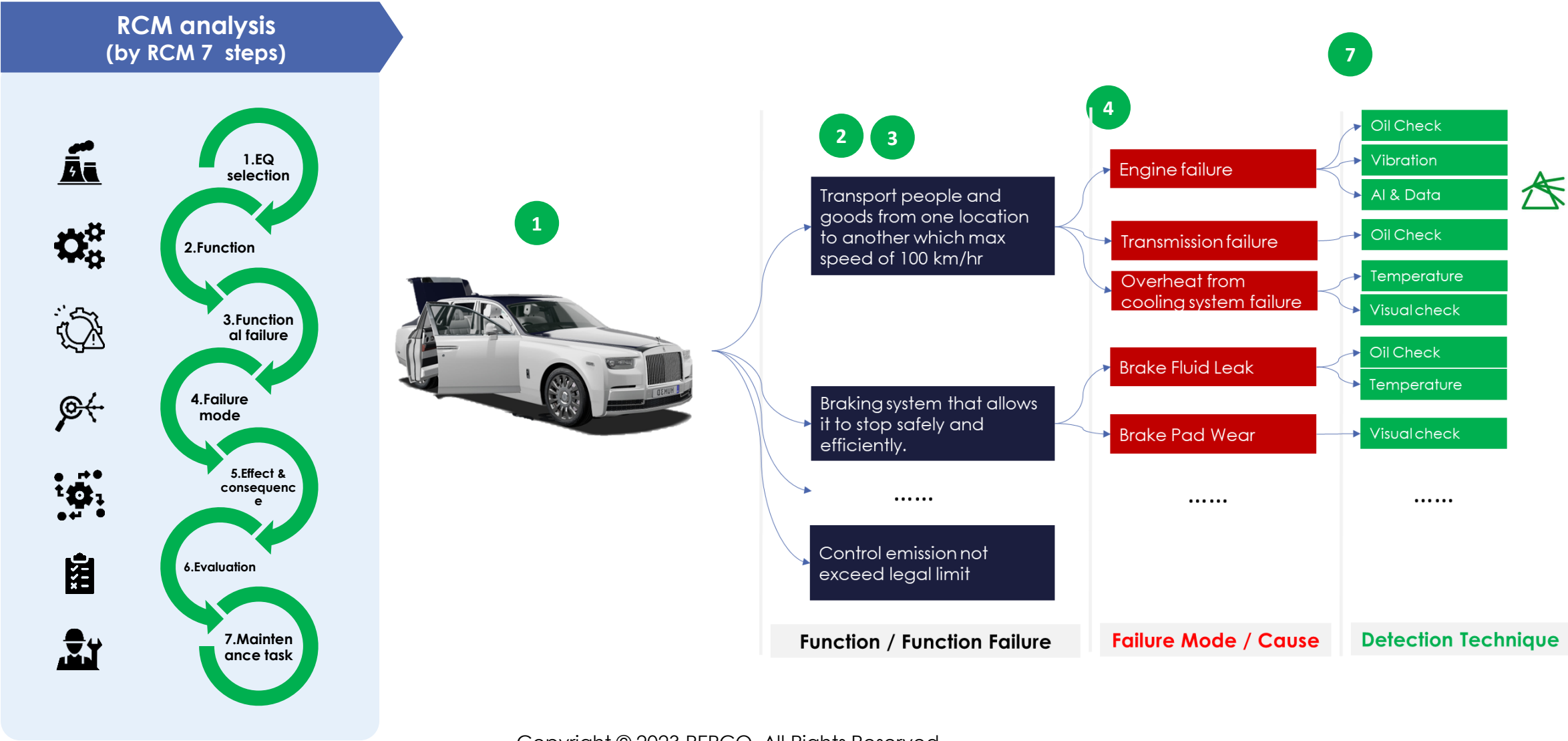
- ✅ Single source of data
- ✅ All teams focus on single platform
- ✅ Consensus Health Scoring criteria
- ✅ Easy to tracking source of problem
- ✅ Easy to control operating window

# UNIFIED HEALTH MANAGEMENT (UHM)

Holistic & Systematic Health Monitoring to Ensure Highest Reliability



Apply Reliability Centered Maintenance (RCM) to coverage all potential failure mode by maintenance detection and prevention

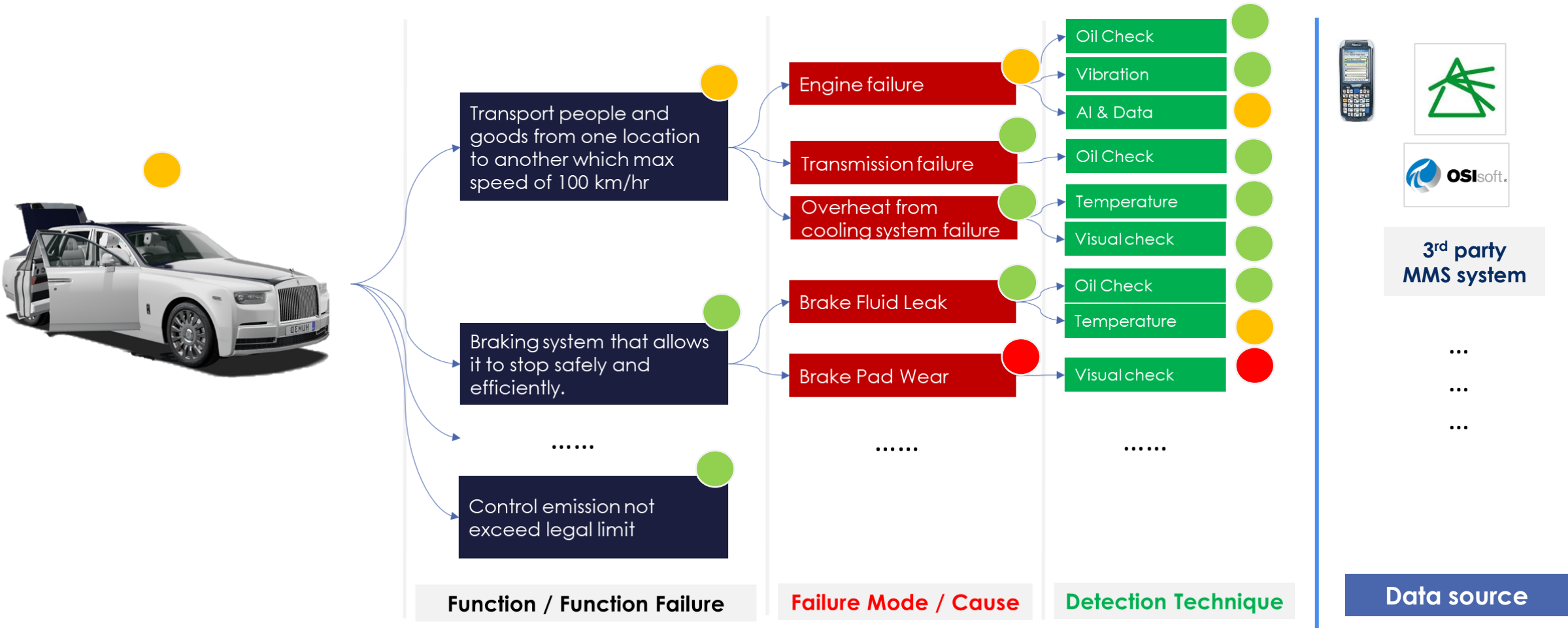


# UNIFIED HEALTH MANAGEMENT (UHM)

Holistic & Systematic Health Monitoring to Ensure Highest Reliability

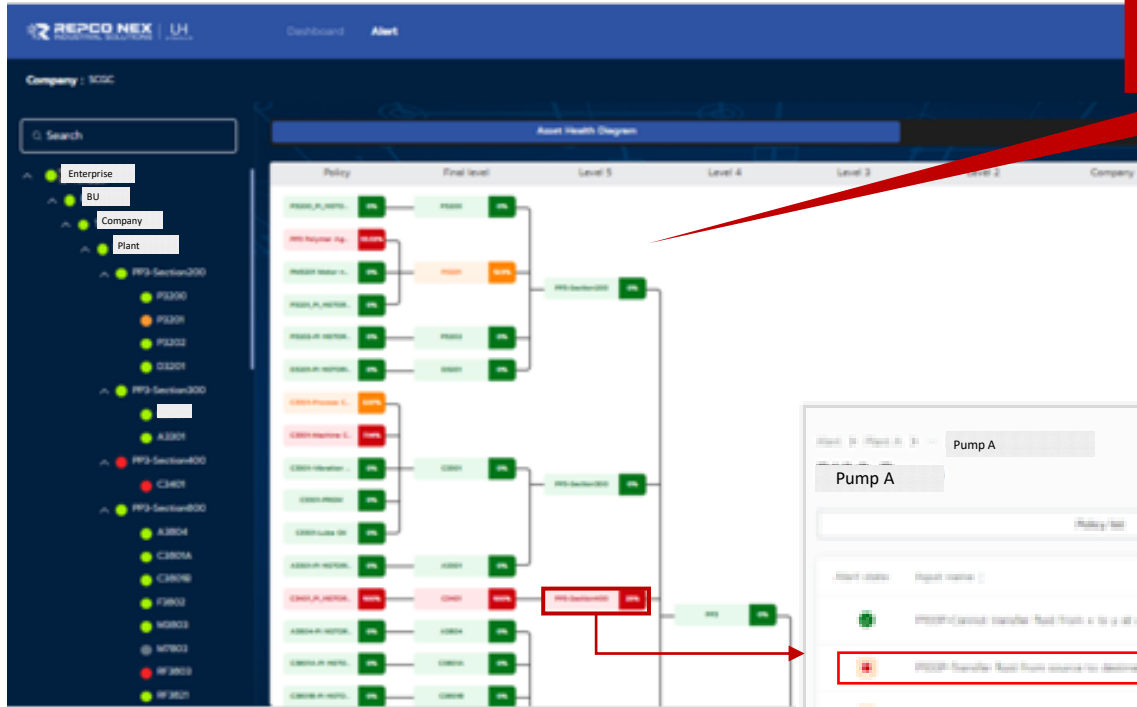


Live RCM for Real Time Failure prevention



# UNIFIED HEALTH MANAGEMENT (UHM)

## Example Dashboard



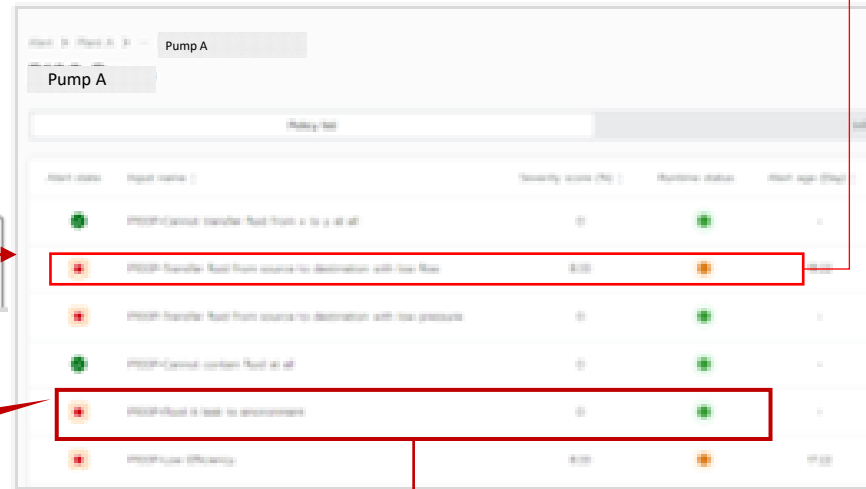
## Asset Health Assessment and potential failure identification

**AVEVA PA**

**Diagnostic :** What problem?

**Prescription :** Proposed solution

Identify potential functional failure for each asset



## Historical Trend for further data analysis

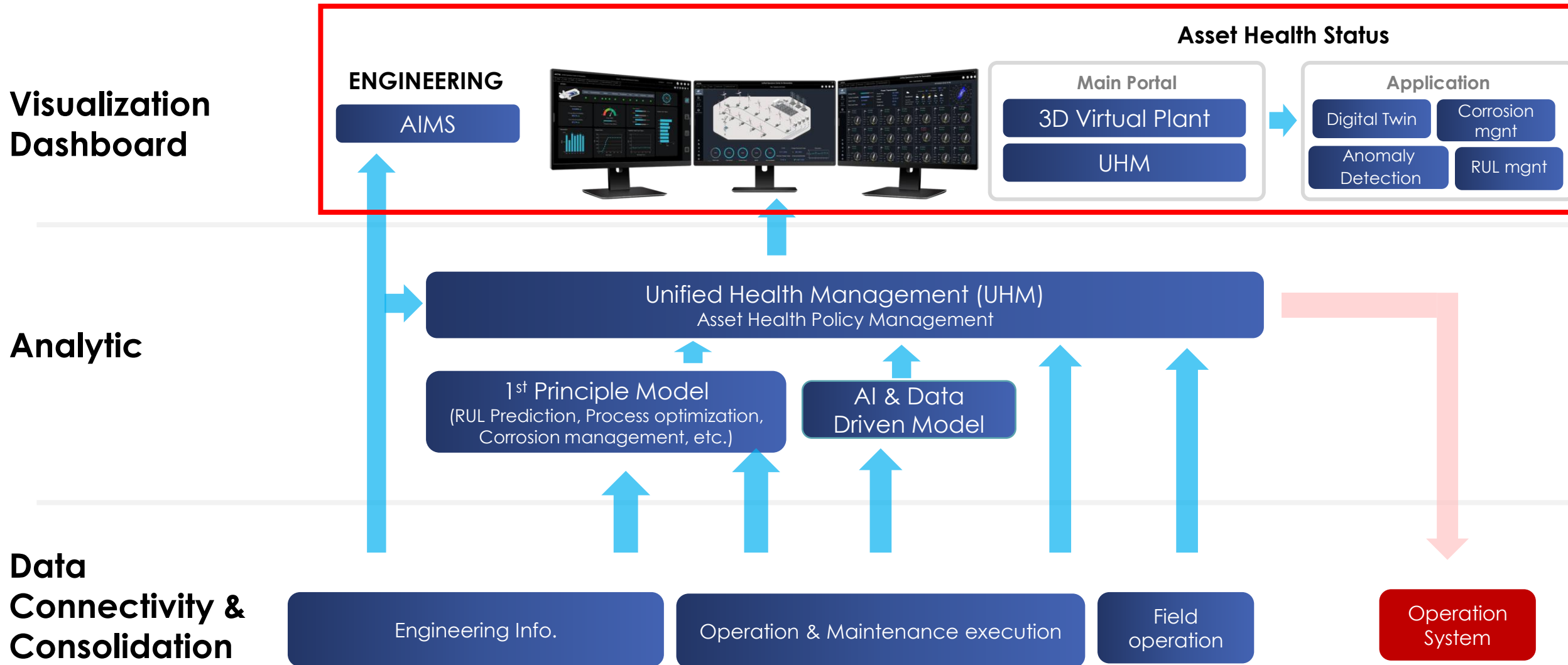




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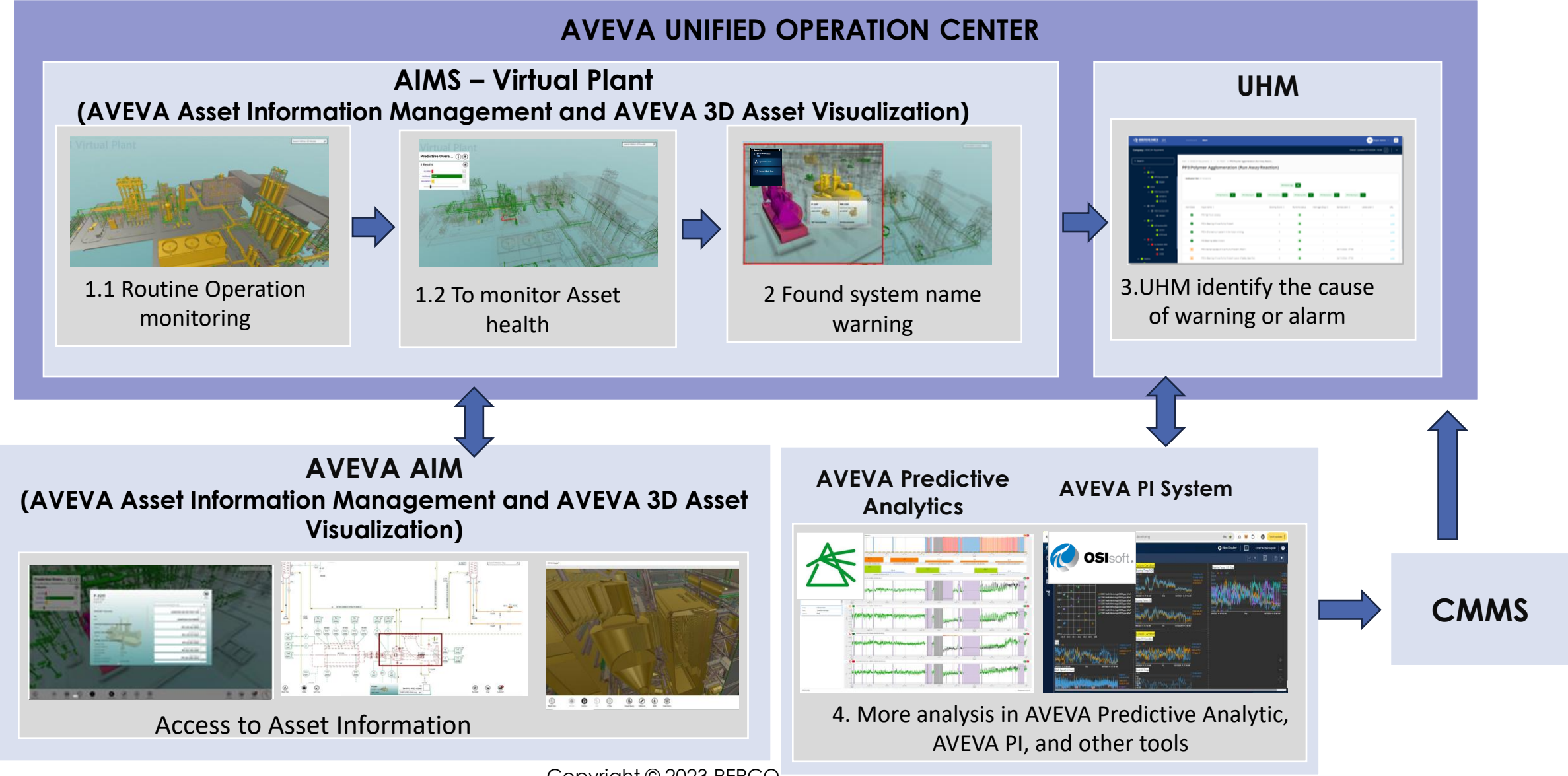
# UNIFIED OPERATION CENTER

## Centralized Asset Performance Management



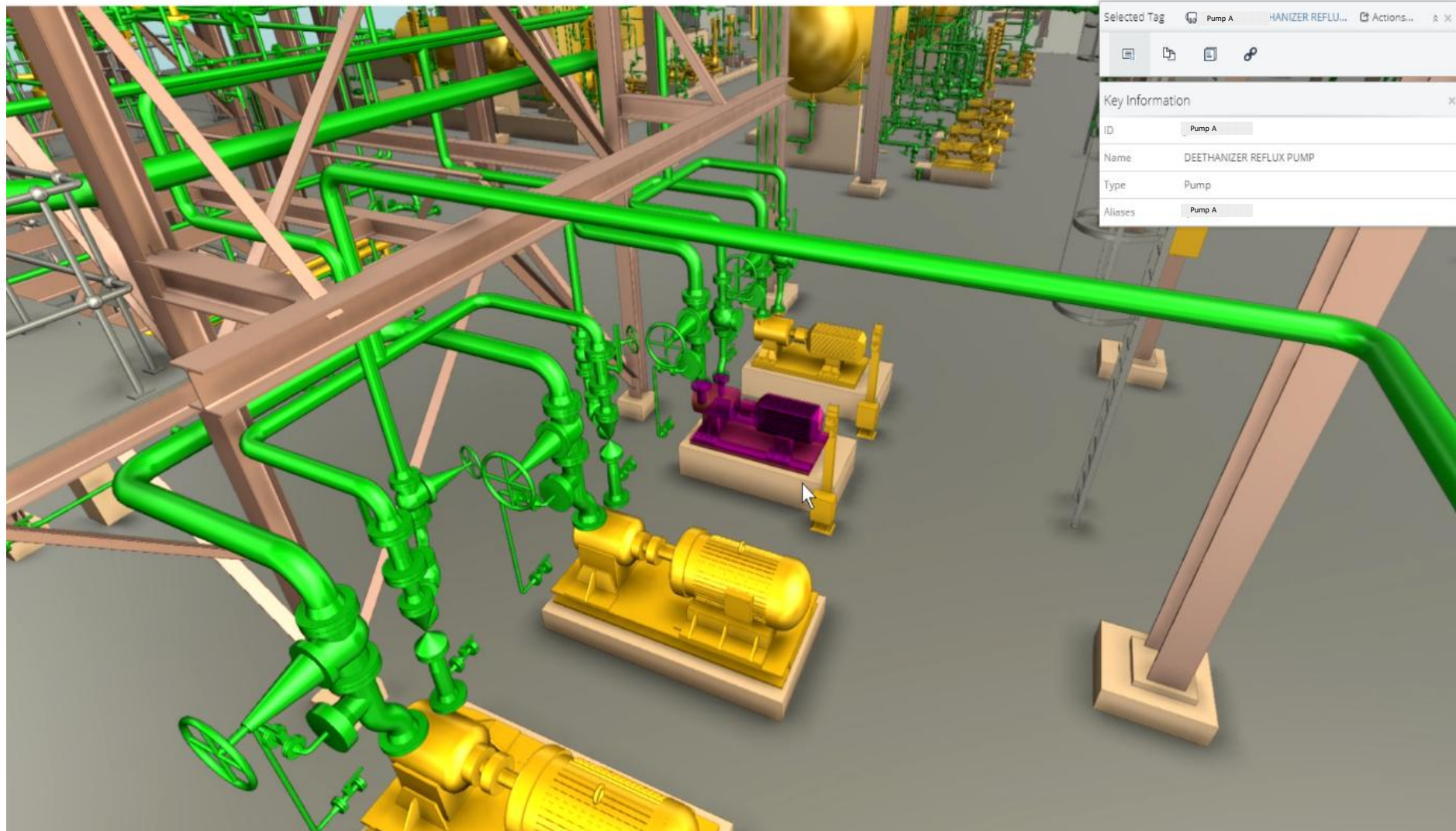
# Unified Operation Center

Daily Operation workflow





# AIMS-Virtual Plant: Asset Digital Twin



- Asset Health Monitoring
- Maintenance work request
- Maintenance Backlog and Work planning.
- Problem diagnosis
- Risk assessment
- Safe job analysis
- Isolation plan assessment
- Incident report

Manage risk, diagnosis reliability and performance problems and optimize work planning and execution with visual APM

“Virtual Plant Solution Clip”

# Fully digital twin with health monitoring



Explore Machine Health in Detail :

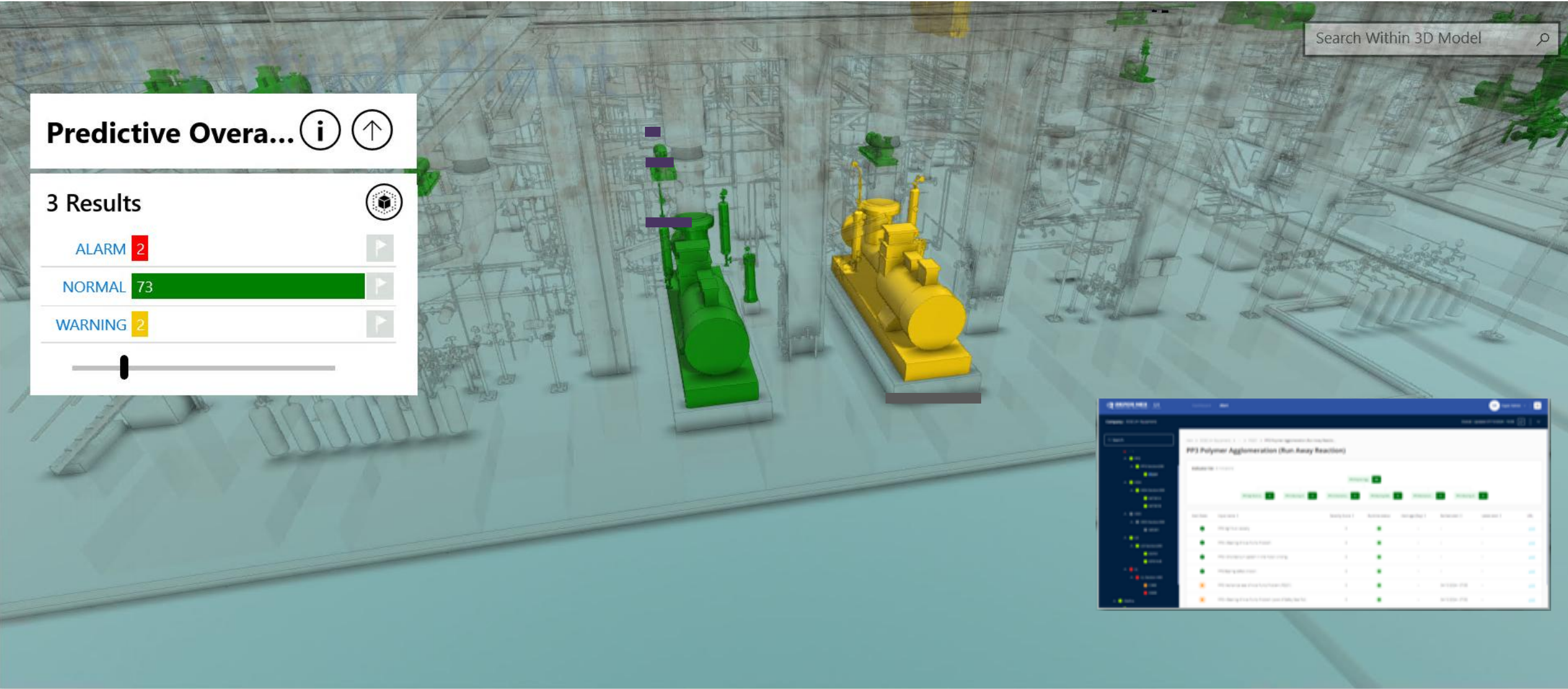
Show health status in detail with related asset information such as machine spec and failure history





# Fully digital twin with health monitoring

Explore Machine Health in Detail :  
Show health status in the summary of health indicators from various health monitoring approaches

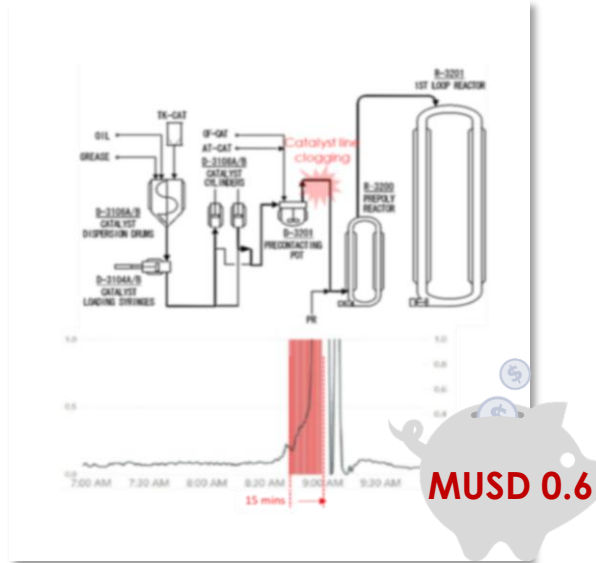




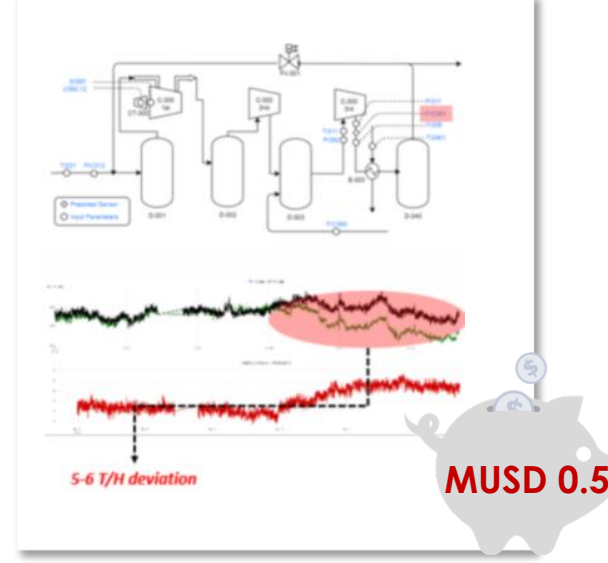
# Proven Business Outcome

## Value Release from Actual Cases

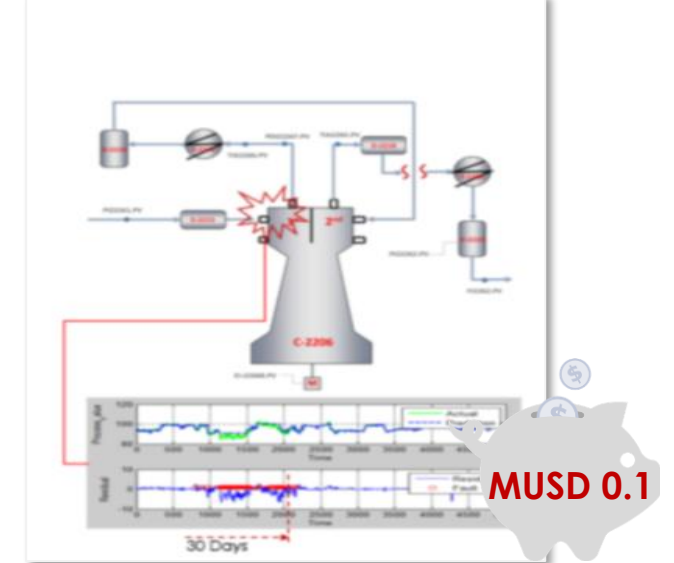
Clogging 15 Early Anomaly Warning



Compressor Min Flow Control Error



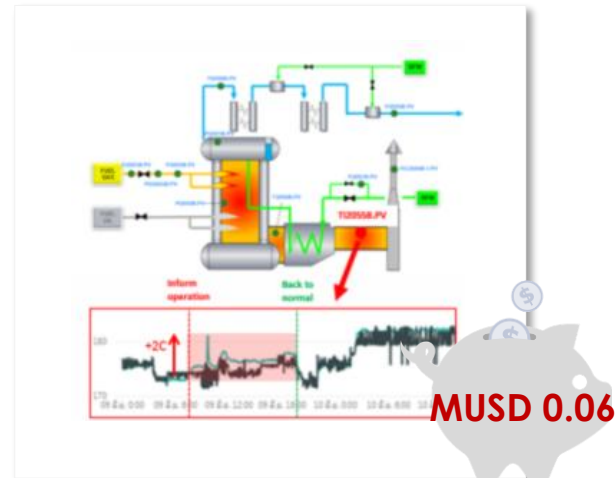
Compressor Valve Crack Early Detection



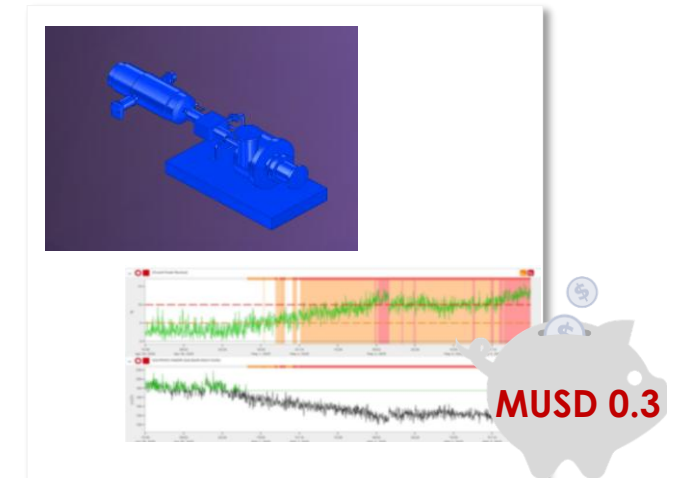
On-line Monitoring Condition



Boiler Low Efficiency



Gas blower – Discharge flow drop



# Thank You

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