X JORNADAS TÉCNICAS ABB EN CHILE, 11 ABRIL, 2017
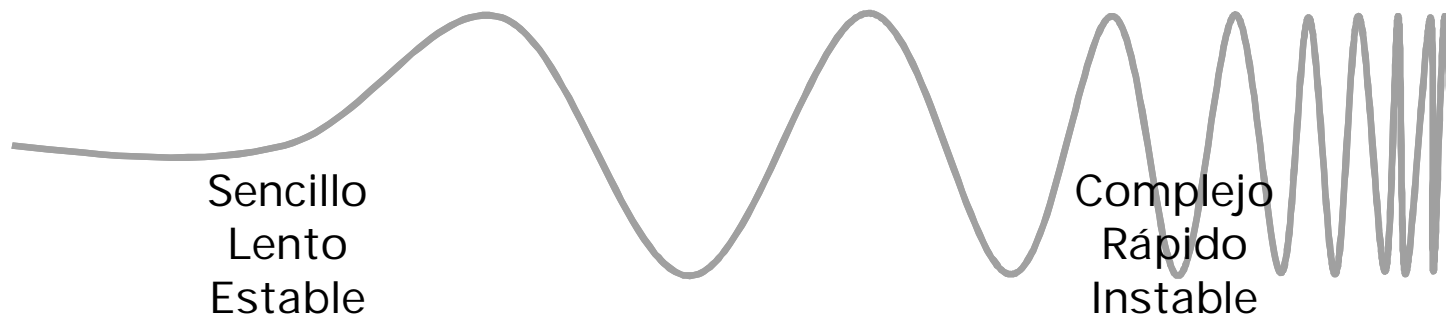
AssetVista
Utilize untapped potential in your mine

Eduardo Ingegneri, Global Product Manager
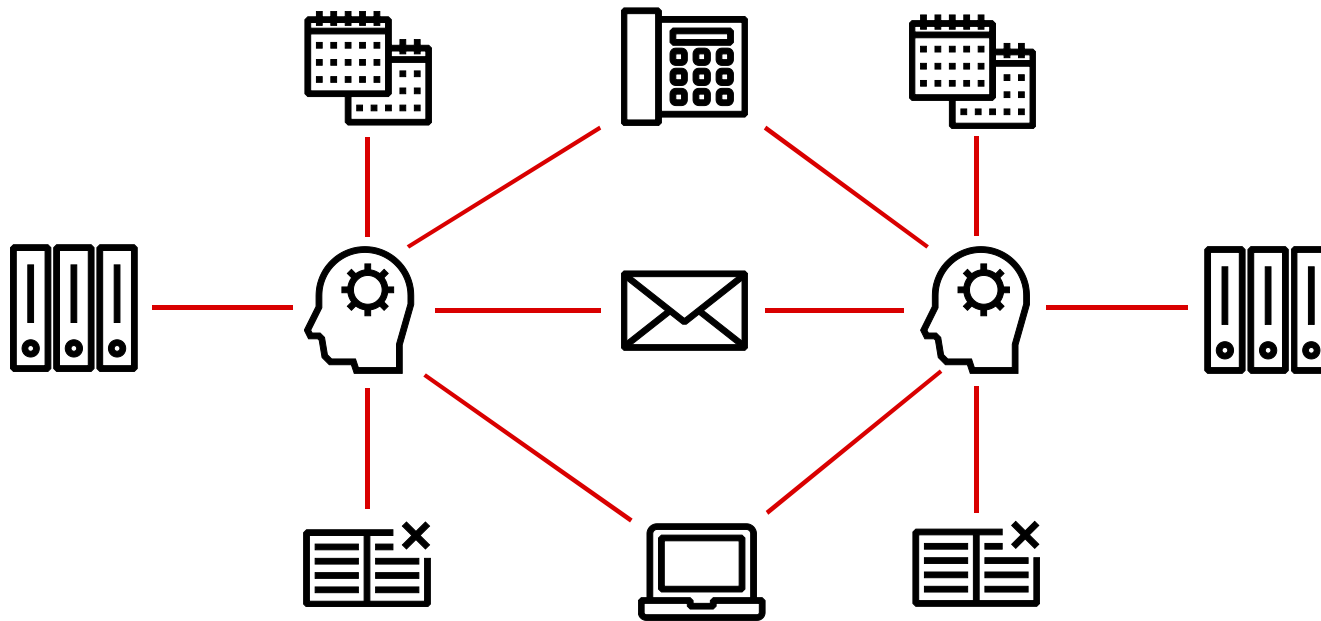
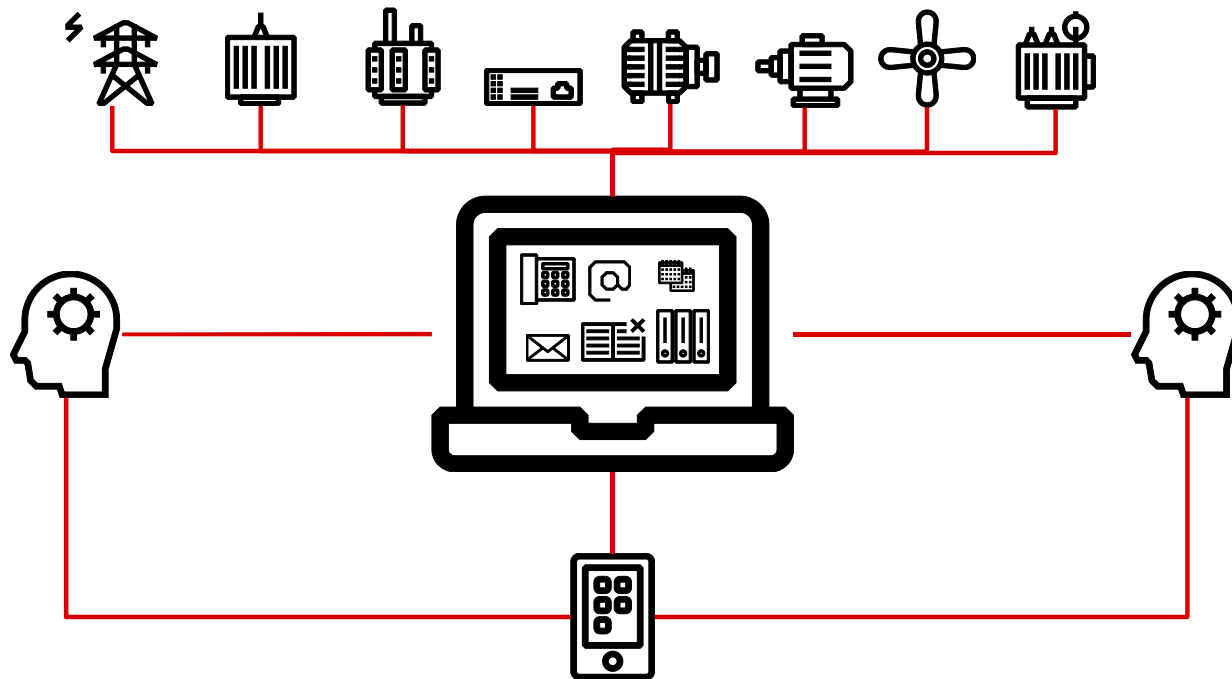# Contexto de mundo

Animación movida por la comunicación

Sencillo
Lento
Estable

Complejo
Rápido
Instable

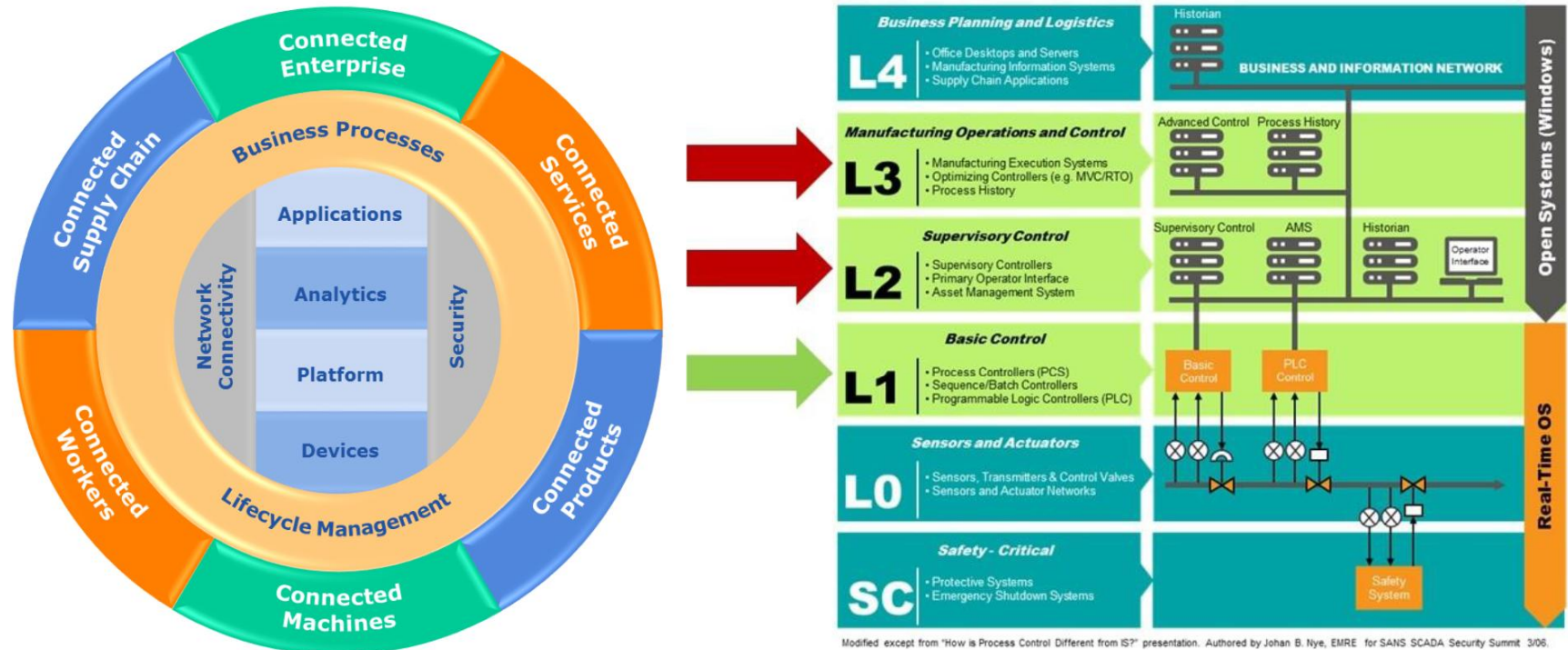# Contexto de mundo

Inundación de informaciones

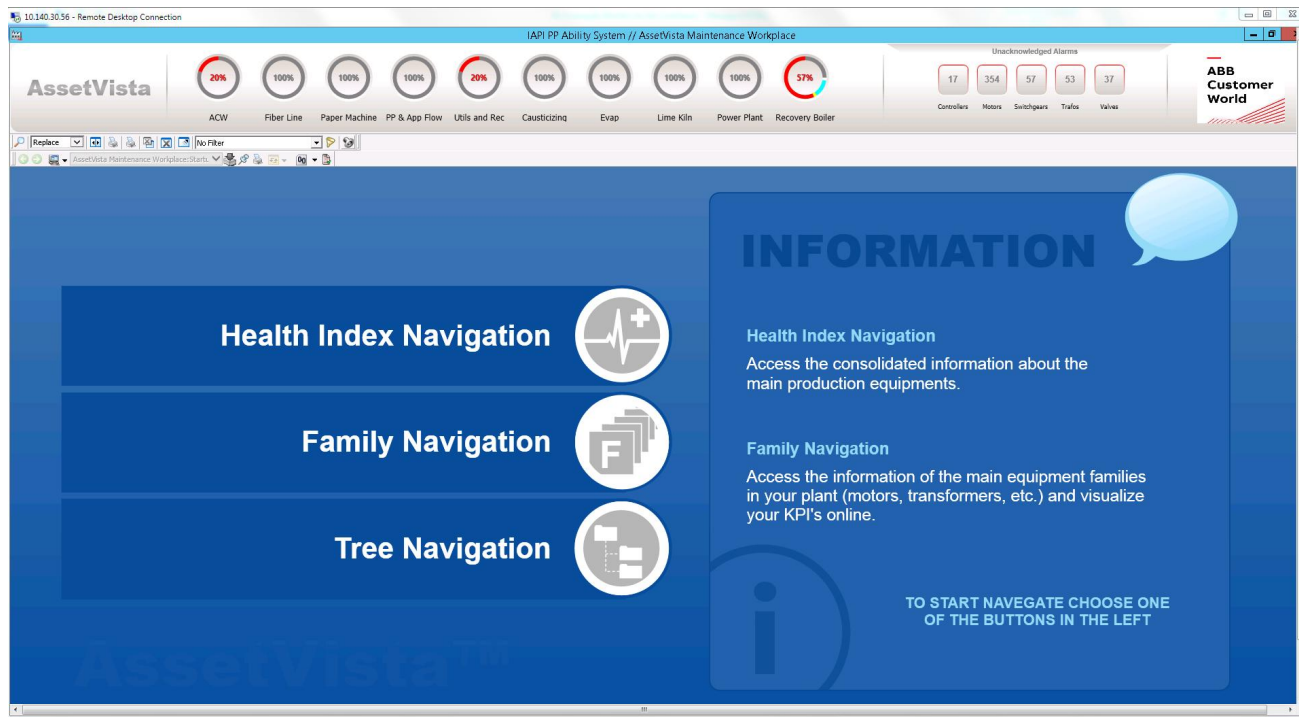# Contexto de mundo

Inundación de informaciones

ABB

ARC Advisory Research – IIoT and Automation levels – Overview

ARC Industrial Internet of Things Model   **ExxonMobil Automation Level Designations**
(Sources: ExxonMobil, ARC)

Informaciones con valor

Interfaces amigables

Informaciones con valor

Dashboards por tipo de equipo

IAPI PP Ability System // AssetVista Maintenance Workplace

AssetVista

20%	100%	100%	100%	20%	100%	100%	100%	100%	57%	
ACW	Fiber Line	Paper Machine	PP & App Flow	Utils and Rec	Causticizing	Evap	Lime Kiln	Power Plant	Recovery Boiler	

Unacknowledged Alarms

17	354	57	53	37
Controllers	Motors	Switchgears	Trafos	Valves

ABB Customer World
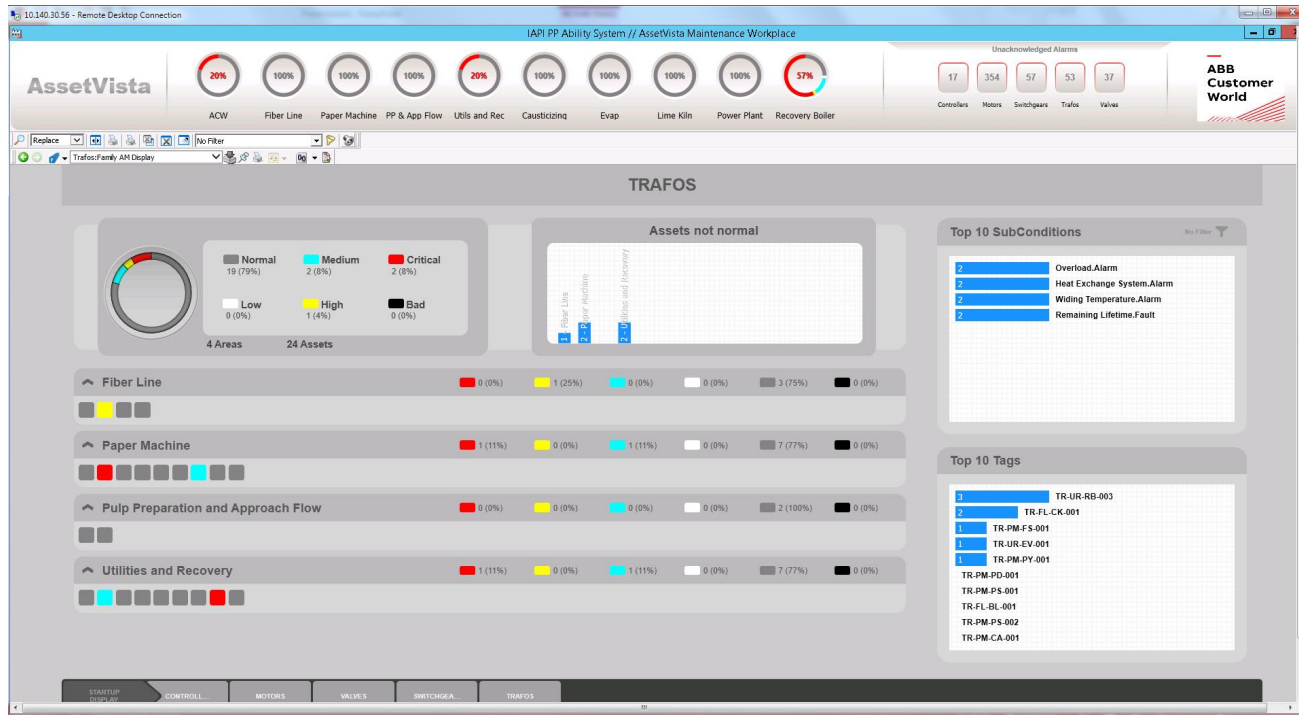
Replace | No Filter

Trafos:Family AM Display

TRAFOS

	Normal 19 (79%)	Medium 2 (8%)	Critical 2 (8%)
	Low 0 (0%)	High 1 (4%)	Bad 0 (0%)

4 Areas   24 Assets

Assets not normal

Fiber Line — 1
Paper Machine — 2
Utilities and Recovery — 2
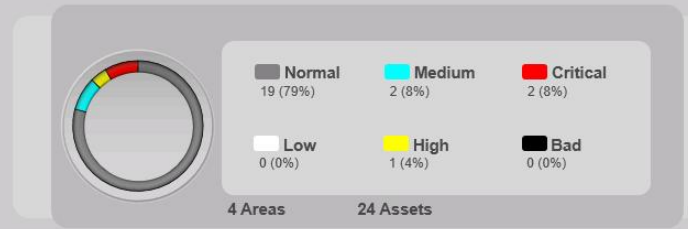
Top 10 SubConditions   No Filter

2	Overload.Alarm
2	Heat Exchange System.Alarm
2	Widing Temperature.Alarm
2	Remaining Lifetime.Fault

∧ Fiber Line

■ 0 (0%)	■ 1 (25%)	■ 0 (0%)	■ 0 (0%)	■ 3 (75%)	■ 0 (0%)

∧ Paper Machine

■ 1 (11%)	■ 0 (0%)	■ 1 (11%)	■ 0 (0%)	■ 7 (77%)	■ 0 (0%)

∧ Pulp Preparation and Approach Flow

■ 0 (0%)	■ 0 (0%)	■ 0 (0%)	■ 0 (0%)	■ 2 (100%)	■ 0 (0%)

∧ Utilities and Recovery

■ 1 (11%)	■ 0 (0%)	■ 1 (11%)	■ 0 (0%)	■ 7 (77%)	■ 0 (0%)

Top 10 Tags

3	TR-UR-RB-003
2	TR-FL-CK-001
1	TR-PM-FS-001
1	TR-UR-EV-001
1	TR-PM-PY-001
	TR-PM-PD-001
	TR-PM-PS-001
	TR-FL-BL-001
	TR-PM-PS-002
	TR-PM-CA-001

STARTUP DISPLAY	CONTROLL...	MOTORS	VALVES	SWITCHGEA...	TRAFOS

Informaciones con valor

Dashboards por área de producción
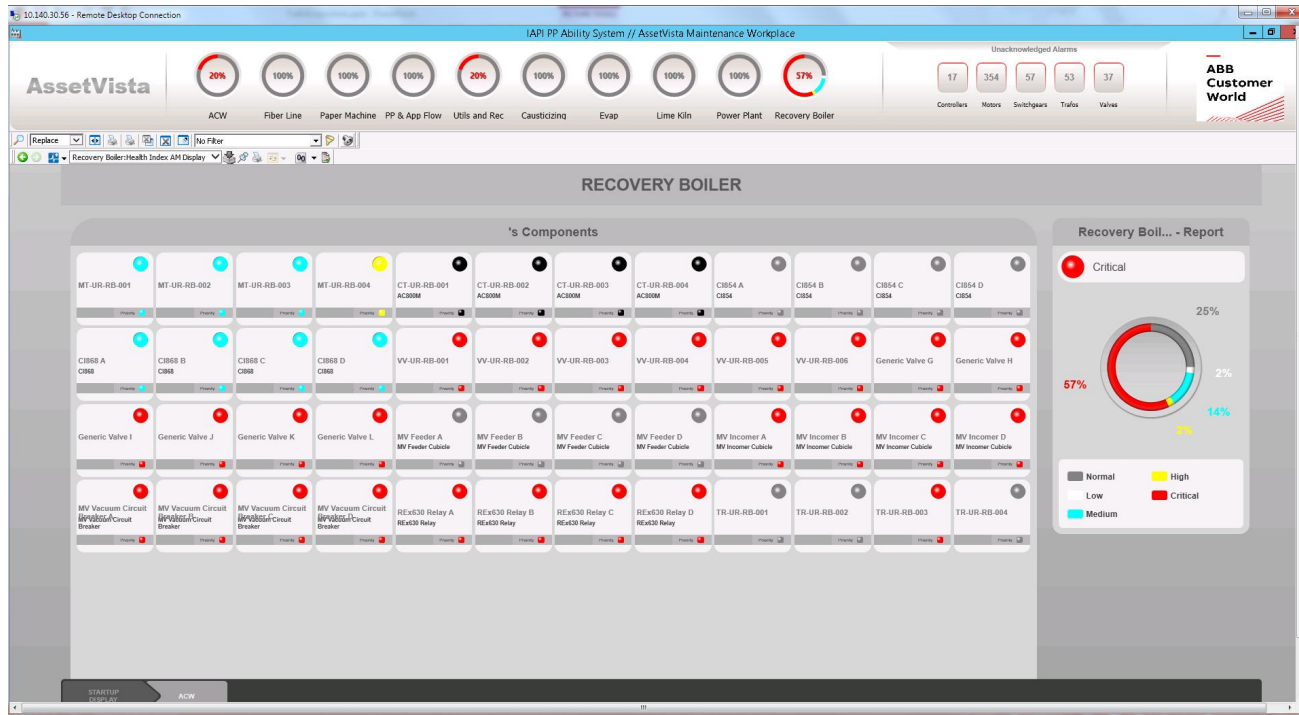
IAPI PP Ability System // AssetVista Maintenance Workplace

AssetVista

20%	100%	100%	100%	20%	100%	100%	100%	100%	57%
ACW	Fiber Line	Paper Machine	PP & App Flow	Utils and Rec	Causticizing	Evap	Lime Kiln	Power Plant	Recovery Boiler

Unacknowledged Alarms

17	354	57	53	37
Controllers	Motors	Switchgears	Trafos	Valves

ABB Customer World

Replace | No Filter

Recovery Boiler:Health Index AM Display

RECOVERY BOILER

's Components

MT-UR-RB-001	MT-UR-RB-002	MT-UR-RB-003	MT-UR-RB-004	CT-UR-RB-001 AC800M	CT-UR-RB-002 AC800M	CT-UR-RB-003 AC800M	CT-UR-RB-004 AC800M	CI854 A CI854	CI854 B CI854	CI854 C CI854	CI854 D CI854
Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority

CI868 A CI868	CI868 B CI868	CI868 C CI868	CI868 D CI868	VV UR RB 001	VV UR RB 002	VV UR RB 003	VV UR RB 004	VV UR RB 006	VV UR RB 006	Generic Valve G	Generic Valve H
Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority

Generic Valve I	Generic Valve J	Generic Valve K	Generic Valve L	MV Feeder A MV Feeder Cubicle	MV Feeder B MV Feeder Cubicle	MV Feeder C MV Feeder Cubicle	MV Feeder D MV Feeder Cubicle	MV Incomer A MV Incomer Cubicle	MV Incomer B MV Incomer Cubicle	MV Incomer C MV Incomer Cubicle	MV Incomer D MV Incomer Cubicle
Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority

MV Vacuum Circuit Breaker A MV Vacuum Circuit Breaker	MV Vacuum Circuit Breaker B MV Vacuum Circuit Breaker	MV Vacuum Circuit Breaker C MV Vacuum Circuit Breaker	MV Vacuum Circuit Breaker D MV Vacuum Circuit Breaker	REx630 Relay A REx630 Relay	REx630 Relay B REx630 Relay	REx630 Relay C REx630 Relay	REx630 Relay D REx630 Relay	TR-UR-RB-001	TR-UR-RB-002	TR-UR-RB-003	TR-UR-RB-004
Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority	Priority

Recovery Boil... - Report

● Critical

25%

57% · 2% · 14% · 2%

■ Normal	□ High
□ Low	■ Critical
■ Medium	
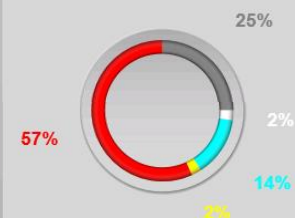
STARTUP DISPLAY | ACW

Informaciones con valor

Información detallada

Informaciones con valor

Información detallada

Informaciones con valor

Información detallada

Report

Ejemplo
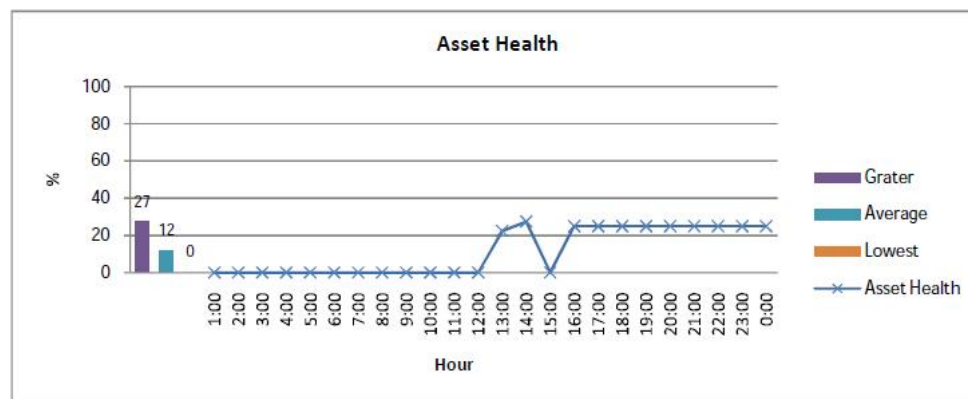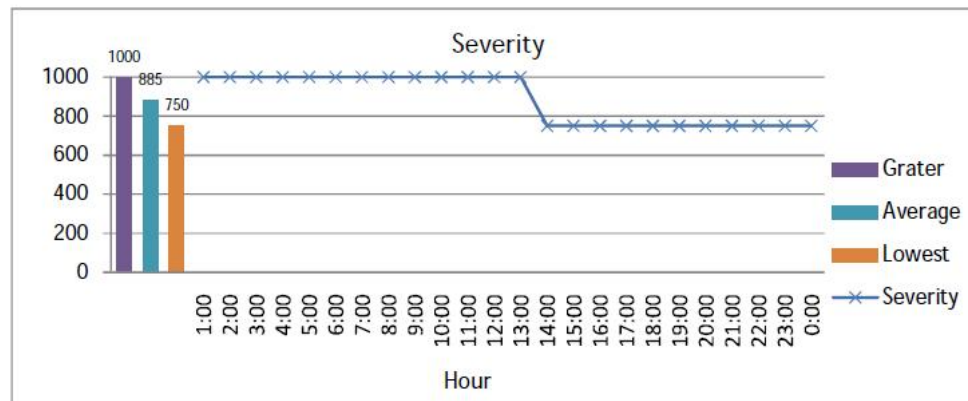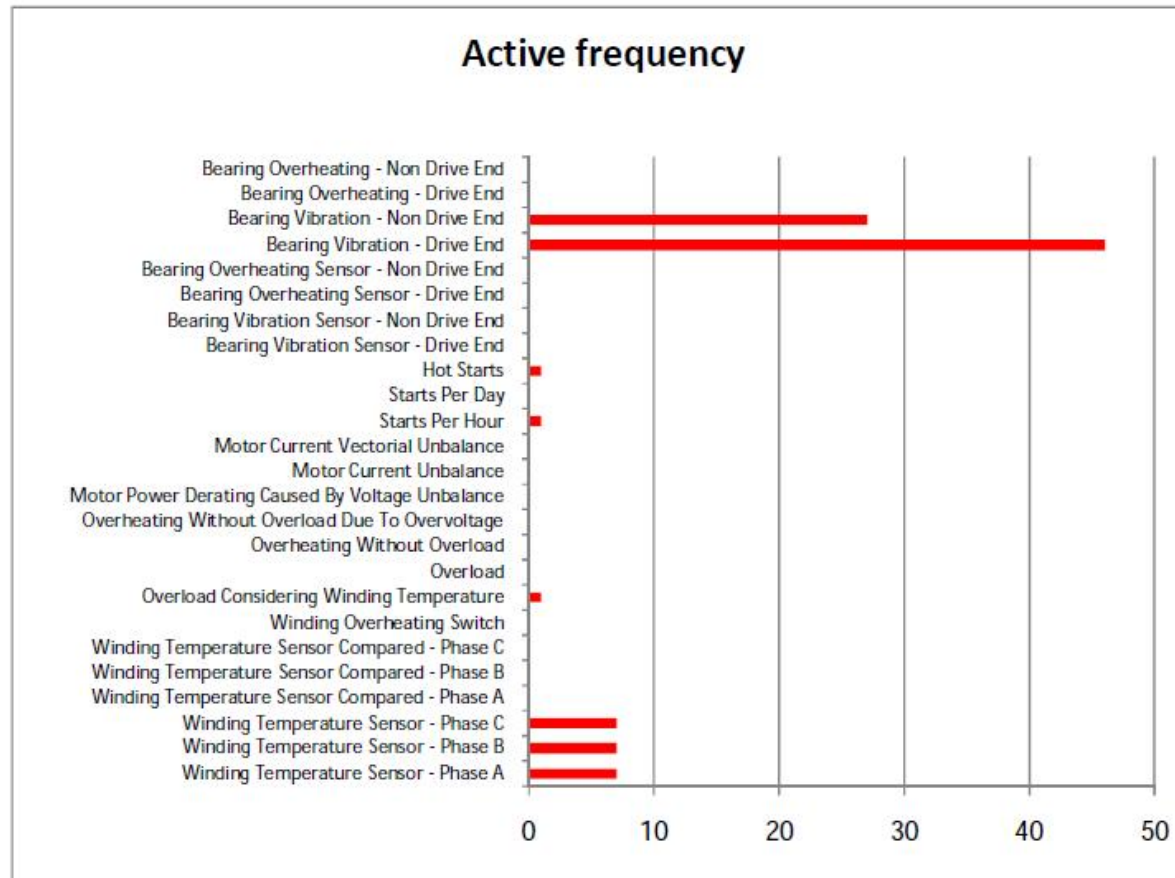
Report

Ejemplo
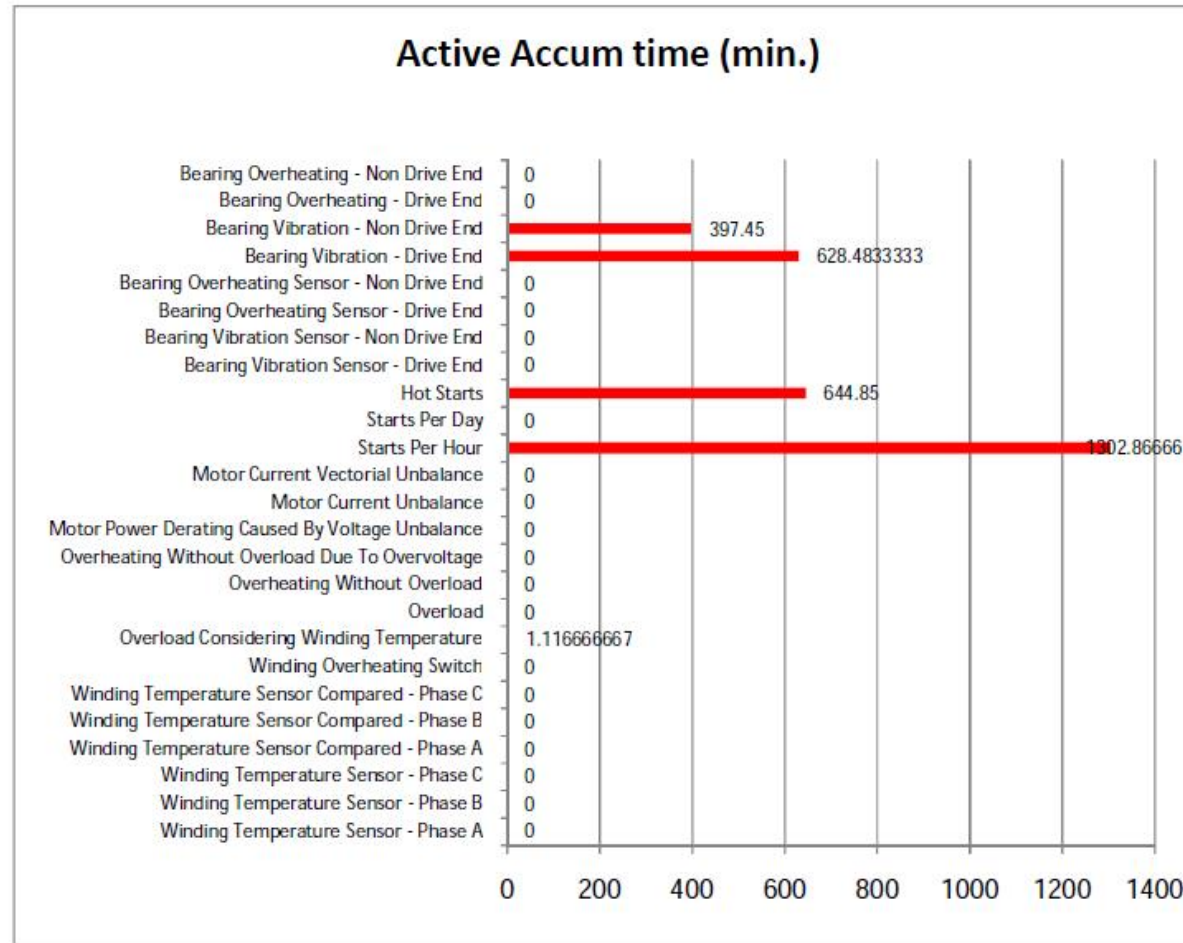
Report

Ejemplo

Report

Ejemplo

Asset Reporter			
Severity	**Condition**	**Sub Condition**	**Description**
500	Winding Temperature Sensor - Phase A	Alarm	1 Phase A winding temperature sensor on failure
500	Winding Temperature Sensor - Phase B	Alarm	1 Phase B winding temperature sensor on failure
500	Winding Temperature Sensor - Phas		
0	Winding Temperature Sensor Comp		
0	Winding Temperature Sensor Comp		
0	Winding Temperature Sensor Comp		
0	Winding Overheating Switch		
500	Overload Considering Winding Temp		
0	Overload		
0	Overheating Without Overload		
0	Overheating Without Overload Due		
0	Motor Power Derating Caused By Vc		
0	Motor Current Unbalance		

0	Motor Current Unbalance	Normal	Motor current unbalance
0	Motor Current Vectorial Unbalance	Normal	Motor current vectorial unbalance
0	Starts Per Hour	Normal	Starts per hour
0	Starts Per Day	Normal	Condition disabled by user
0	Hot Starts	Normal	Hot starts
0	Bearing Vibration Sensor - Drive End	Normal	Bearing vibration sensor - drive end
0	Bearing Vibration Sensor - Non Drive End	Normal	Bearing vibration sensor - non drive end
0	Bearing Overheating Sensor - Drive End	Normal	Bearing overheating sensor - drive end
0	Bearing Overheating Sensor - Non Drive End	Normal	Bearing overheating sensor - non drive end
750	Bearing Vibration - Drive End	Alarm	1 Bearing drive end on failure
750	Bearing Vibration - Non Drive End	Alarm	1 Bearing non drive end on failure
0	Bearing Overheating - Drive End	Normal	Bearing overheating - drive end
0	Bearing Overheating - Non Drive End	Normal	Bearing overheating - non drive end

ABB
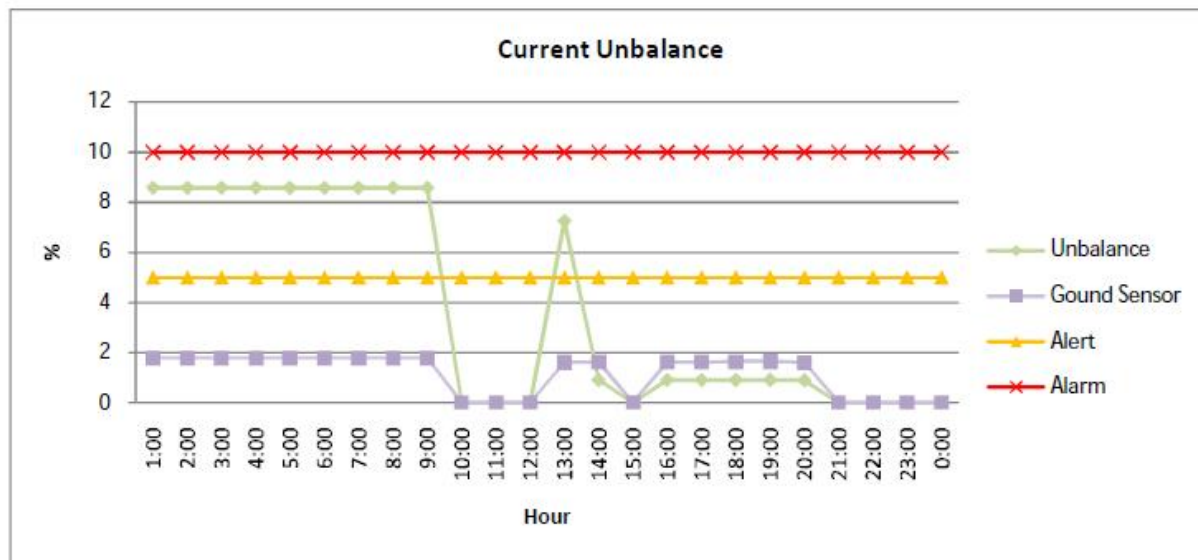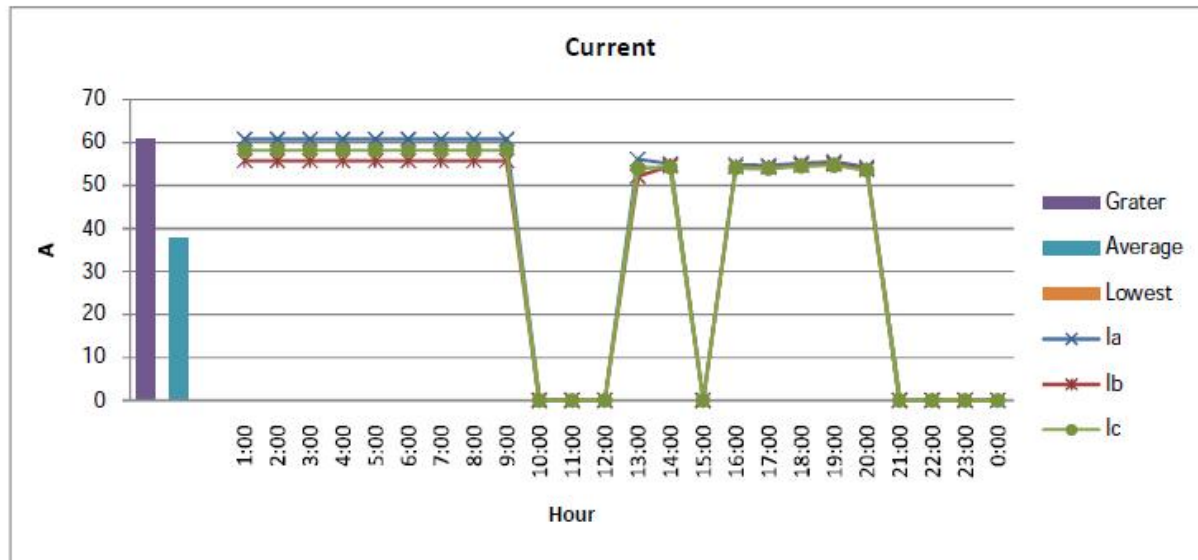
Report

Ejemplo

Report

Ejemplo
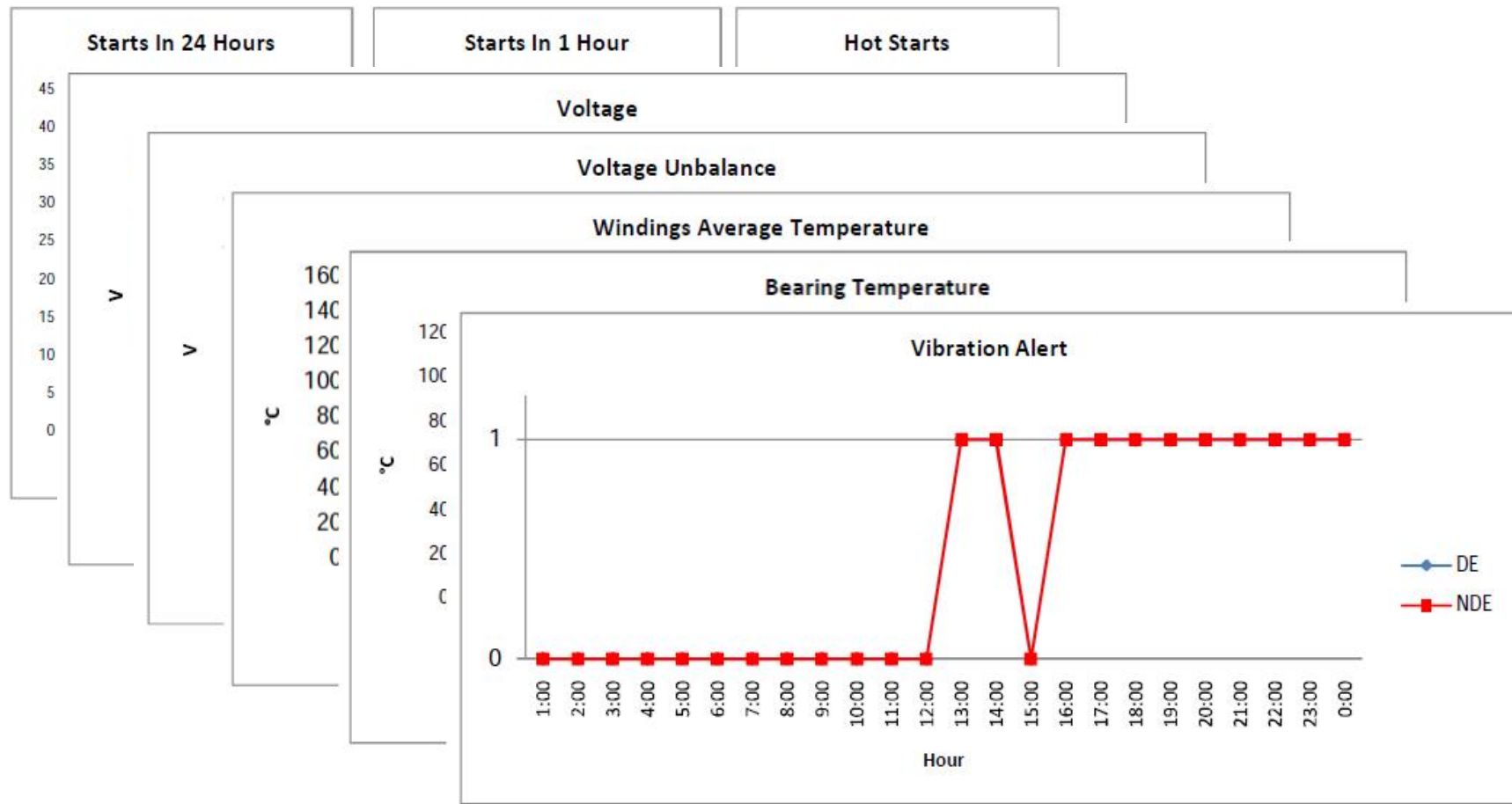
Algoritmos específicos
Con base en normas y literatura técnica

FTA / FMEA / FMECA / RCA / RCM

Input signals:
- Current
- Voltage
- Winding temp
- Bearing temp
- Bearing vibration

Gears:
- Data Sheet
- Input Signals
- Fault Tree Analysis

Outputs:
- Number of starts
- Number of hot starts
- Sensors failure
- Overload
- Ventilation failure
- Power derating
- Incipient failure to earth
- Bearing lubrication outage
- Bearing wear

ABB
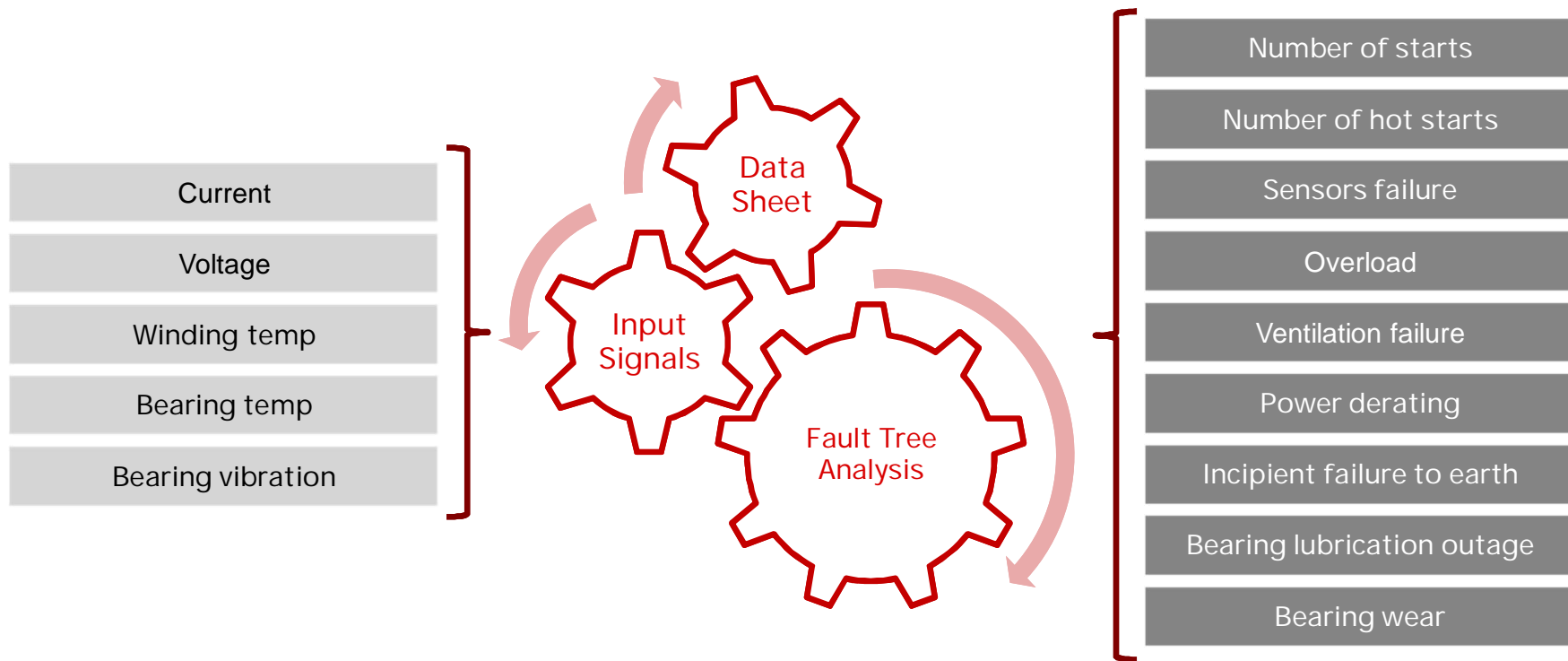
Combinación de fuentes distintas

Informaciones sin correlación

12 Possible Conditions

Data A1 — Condition A1
Data A2 — Condition A2
Condition A1.A2

Data B1 — Condition B1
Data B2 — Condition B2
Condition B1.B2

Data C1 — Condition C1
Data C2 — Condition C2
Condition C1.C2

Data D1 — Condition D1
Data D2 — Condition D2
Condition D1.D2

A sensors

B sensors

C sensors

D sensors

ABB
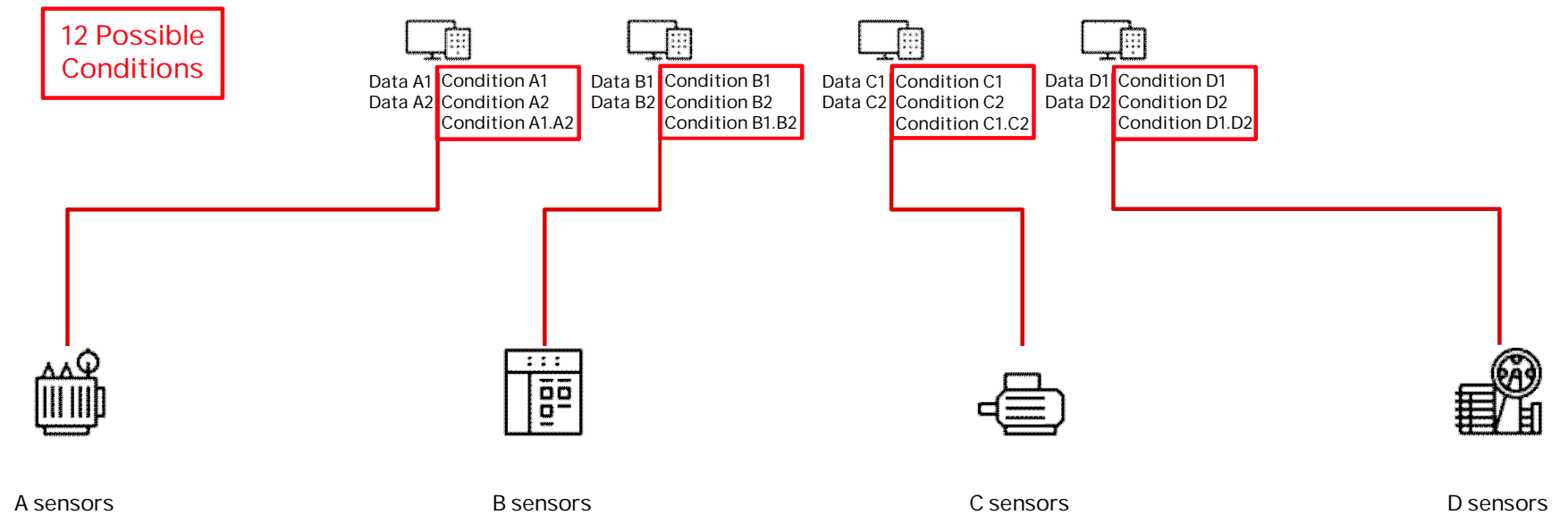
Combinación de fuentes distintas

Informaciones correlacionadas permiten mejor diagnóstico y prescripción

>60 Possible Conditions

Data A1	Condition A1; A2; B1; B2; C1; C2; D1; D2
Data A2	Condition A1.A2; B1.B2; C1.C2; D1.D2
Data B1	Condition A1.B1; A1.C1; A1.D1; A2.B1; A2.C1; A2.D1; A1.B2; A1.C2; A1.D2; A2.B2; A2.C2; A2.D2
Data B2	Condition B1.C1; B1.C2; B2.C1; B2.C2; B1.D1; B1.D2; B2.D1; B2.D2
Data C1	Condition C1.D1; C1.D2; C2.D1; C2.D2
Data C2	Condition A1.B1.C1; A1.B1.C2; A1.B2.C1; A1.B2.C2; A2.B1.C1; A2.B1.C2; A2.B2.C1; A2.B2.C2
Data D1	Condition A1.B1.C1.D1; A1.B1.C1.D2; A1.B1.C2.D1; A1.B1.C2.D2; A1.B2.C1.D1; A1.B2.C1.C2; ...
Data D2	Condition A2.B1.C1.D1; A2.B1.C1.D2; A2.B1.C2.D1; A2.B1.C2.D2; A2.B2.C1.D1; A2.B2.C1.C2; ...

A sensors   B sensors   C sensors   D sensors

ABB

Combinación de fuentes distintas

Un equipo afecta el otro
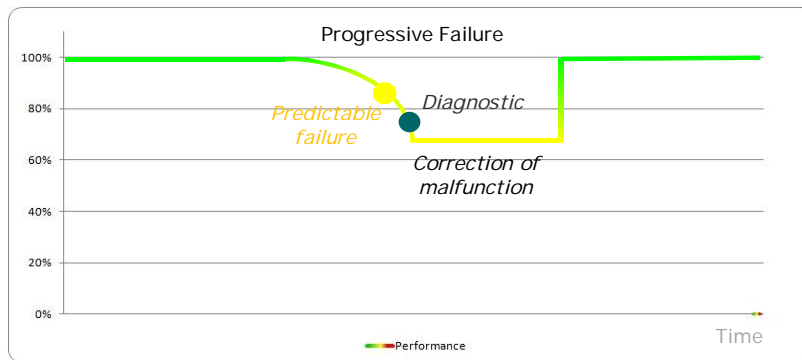
Predictive maintenance benefits:

- *Lower Maintenance Cost;*
- *Improved MTTR (Mean Time to Repair)*
- *Improved asset availability*
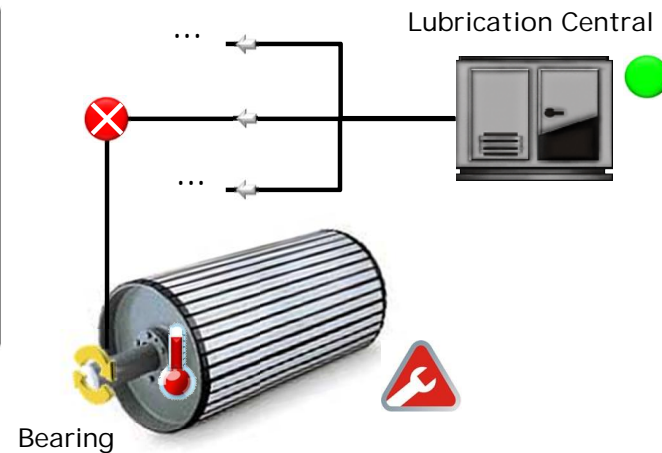
Diagnostic

Problem: High temperature in bearing LD

Possible cause: Failed Lubrication

Suggested Action: Check Lubrication System

ABB

Información en tempo real

Ejemplo

decision-making is carried out based on the *criticality* of the components relative to the *parent equipment*

The condition of the conveyor belt is the combination of sub conditions of its components based on *hierarchical diagram*

component condition based on the *monitored failure modes*

The easy *root cause analysis* enables the reduction of the *mean time to repair - MTTR*

Intuitive navigation, seamless integration with *EAM*

ABB

Soporta decisiones rápidas

Ejemplo
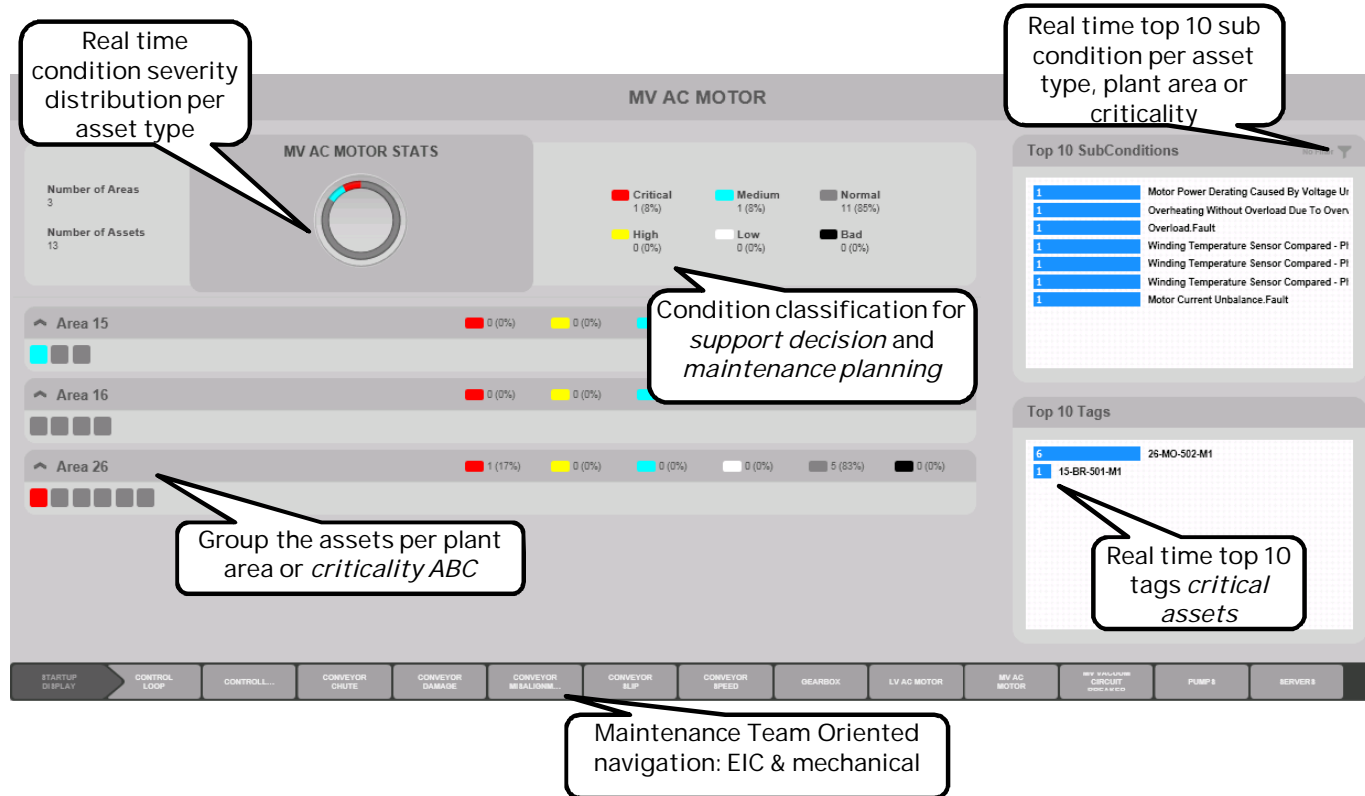
Maximiza tu OEE

Proposición de valor

Producción Efectiva

Reducción del tiempo de parada

- Identificación de fallo potencial, evita paradas no planeadas.
- Identificación de causa, reduce time-to-repair.

Maximiza desempeño

- Confianza en la real condición del equipo para producir en máxima velocidad.
- Programación detallada del mantenimiento, auxilia el proceso de decisión.

Aumenta la calidad

- Consumo menor de material
- Reduce el re-trabajo

Integración total

800xA Asset Optimization Server

Cyclic or event driven execution of AM

Input data
OPC Data Source → **AM** → Asset Condition Events

800xA Platform and Connectivity Servers

OPC Data Source

Input Data:
- Process Variable
- Equipment Variable
- Environmental Variable
- Equipment Faceplate data

Maintenance Workplace

Open Work Order

Enterprise Asset Management

- Work Orders
- Spare Parts
- Equipment Status
- Preventive Maintenance

ABB

AssetVista Overview

Maintenance data in user-friendly dashboards for a faster and accurate decision-making process

Identifying potential failures either periodically or in real-time before they affect the productivity

Periodic reports support your maintenance team with direct and detailed asset information

Easy-to-use root cause analysis allows a quick fail detection and reduces production losses

CRH, January 2017

Collaborative Production Management

High levels of visibility across the value chain and between operations

125
YEARS IN
SWITZERLAND
www.abb.com

Power and productivity
for a better world™

ABB

ABB in Mining solution suite
A holistic approach to the entire mine operation

Financial Layer	ERP Functions			Months
Planning Layer	Business intelligence	Asset health center	Ellipse inventories	Weeks
	Ellipse maintenance	Intelligent mine solutions	Customer applications	Days
Process Management Layer	**Collaborative Production Management** Production information – Condition monitoring – Energy management			Hours, shifts
	Mine & minerals control and optimization applications Ventilation on demand – Grinding & flotation APC – Integrated Mine Operations			Minutes
	Process and power control systems core Electrification – wireless communication – localization			Seconds
	Mine → **Transport** → **Ore processing plant** → **Transport** → **Port**			Real time

Power and productivity
for a better world™

ABB

Plant Asset Management
AssetVista

Plant Asset Management
Validate Saving Numbers

AssetVista Value Proposition

VALUE

Operational Safety

Risk mitigation
(fewer people on the field)

25% less field maintenance tasks

Productivity

Reduce maintenance team
(Automation+Electrical+Instrumentation)

Reduce unplaned shutdows

Quick detection & diagnosis
(Troubleshooting)

RESULTS

Workforce optimization

7 people realocated in
the maintenance team
(Line 1 + Line 2)

Cost reduction in planned shutdown

Reduction 10-30%
(Automation+Drives+Elet.Distr+Instrum)

Reduction of unplanned downtime
XX hours/year for H1 - $$
XX hours/year for H2 - $$

BENEFITS

Savings

Yearly Saving

Line 1 – $$
Line 2 – $$

ROI

Line 1 – 2 years
Line 2 – 1 year

ABB

Plant Asset Management
Pulp Mill

Pilot description

- Areas
  - Utilities, Cooking, Drying and Wood Yard process areas involved;
- Assets
  - 25 LV and MV motors
  - 300 control valves
  - Production equipment and components: Digester

Project phases

- Maintenance assessment
- Servers configuration
- Fault Tree Analysis
- Special Asset monitors development
- Field implementation
- Commissioning
- Customer training
- Follow up, corrections and improvement

ABB

Continuous improvement of maintenance process

Equipment

Components

AssetVista
Support the decision-making process

Data Source

Process Data "on/offline" **1**

Transform data into information

History Data

1

Engineering Maintenance

Evaluation and optimization

2

Planning and execution

Expert Monitoring System

3

Transform info into knowledge

5   **5**   **4**

Maintenance Strategy
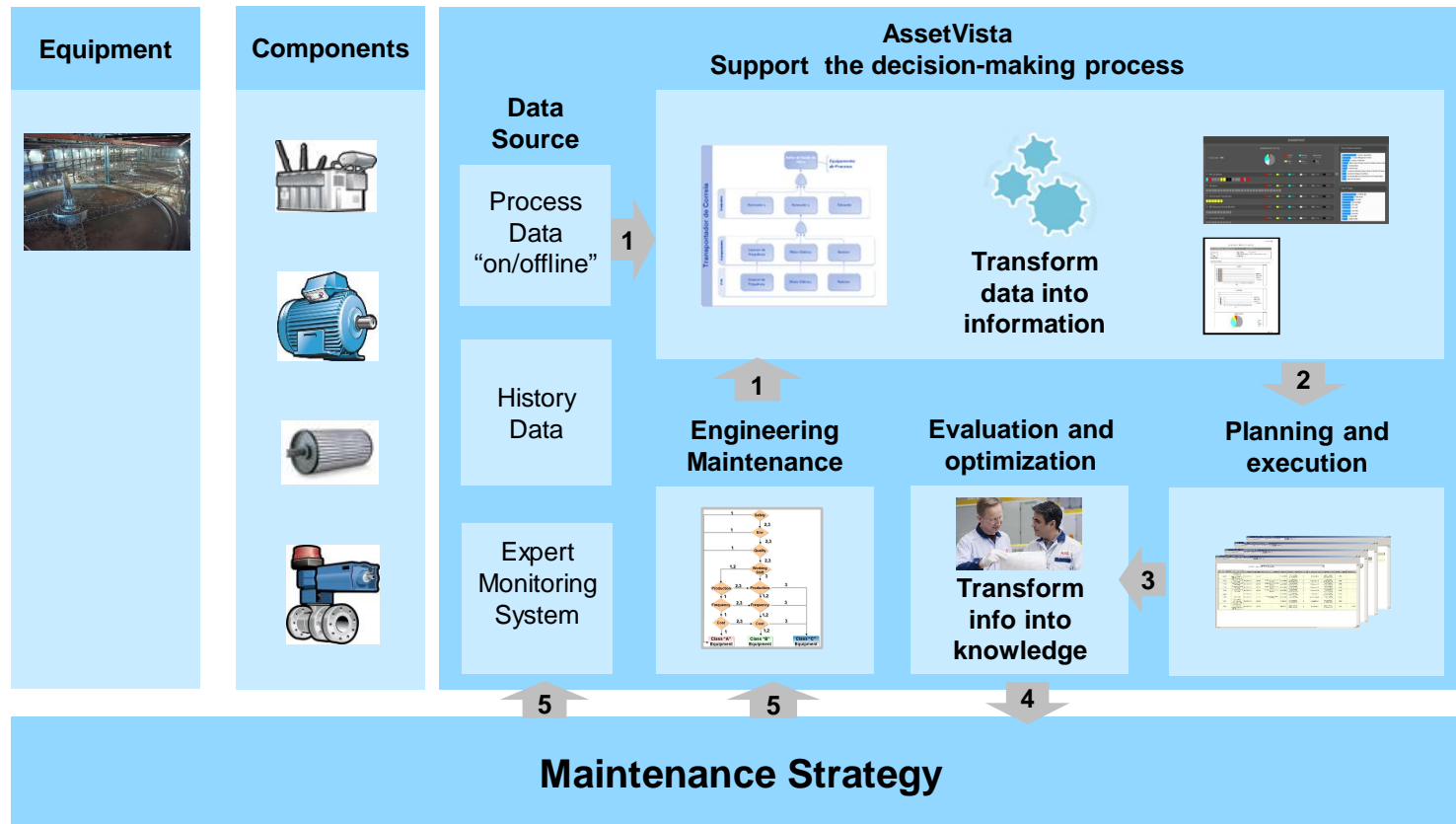
Plant Asset Management
Valve Asset Monitor 1/2
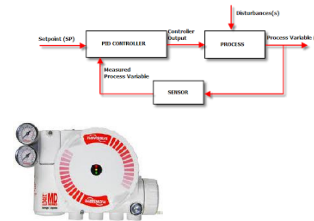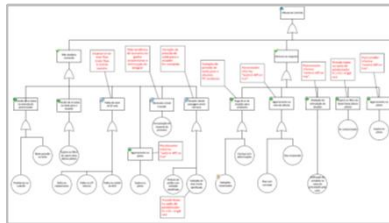
AssetVista consulting:
- Maintenance requirement
- Maintenance process
- Maintenance end user

AssetVista maintenance engineering
- FTA development and condition monitoring assignment
- Evaluate required inputs and data sources
- Develop condition monitoring algorithms
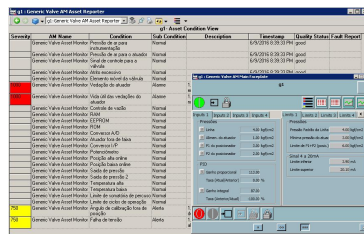
AssetVista automation engineering
- Evaluate condition monitoring capability (technology)
- Follow up device integration for better serve maintenance and not only control

Power and productivity
for a better world™

ABB

Plant Asset Management
Valve Asset Monitor 2/2

AssetVista engineering:
- Development of asset monitor or assignment of a existing AssetVista asset monitor
- Map of input data
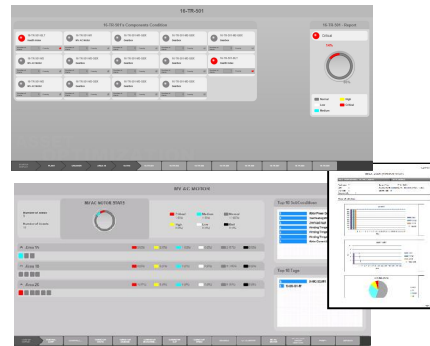
AssetVista engineering:
- Setup dashboards based on criticality, area
- Pareto for most activated failures
- Pareto for devices with more alerts

Practical result of AO with maintenance engineering:
- Condition based maintenance, reduced route inspection and reduce reactive maintenance.
- Improvement of instrumentation technicians knowledge concerning to positioners
- Prevented losses

Plant Asset Management
Valve Asset Monitor Maintenance Inspection Workflow

- Overview of all devices from same family
- Only important maintenance alerts
- Cross reference analysis device and process
- Threshold limits exposed outside the DTM
- Allow tuning of condition monitoring to avoid false positives
- Interaction with faceplates without impact over operation
- Access to DTM only for Root Cause Analysis

Power and productivity
for a better world™

ABB

Plant Asset Management
Results Control Valves

Control valve monitoring

- **Before:** time consuming access to interface of each positioner. Automatic monitoring disabled, standard positioner asset monitor **does not attend** maintenance **requirements**.

- **After:** all **critical** valves are **checked** in **hours** and maintenance expend time verifying only problematic valves. Only **raises** conditions that **matter** to maintenance.

Main gain:

- Condition based maintenance, reduced route inspection and reduce reactive maintenance.

Marginal gain

- Improvement of instrumentation technicians knowledge concerning to positioners

Main problems detected:

- Air filter;
- Air pressure;
- Positioner hardware;

Action:

- Maintenance corrected problems with 100% of accuracy

Plant Asset Management
Results Electric Motors

Electric motors monitoring

- **Before:** traditional predictive maintenance, vibration and thermography **without** interface between **electrical maintenance** and **control system**.

- **After:** monitors **operational issues** that lead failures, additionally **data not used before** via **control system**, i.e. temperature are **monitored** and support **fast decision** making **process**

Main gain:

- Predictive maintenance, more motors monitored, easy improvement initiatives

Problems detected:

- Too many starts per hour, day and hot starts
- Bearings overheated, reducing grease efficiency and bearings life
- Big temperature difference between bearings and wiring of the 3 phases

Action:

- Operational disturbance requires further analysis

ABB recommendation:

- Check if motor is adequate to the work condition and specified accordingly **S4 duty**

Result:

- Motor was specified for **S1 duty**

Tool without engineering
Maintenance Inspection Workflow
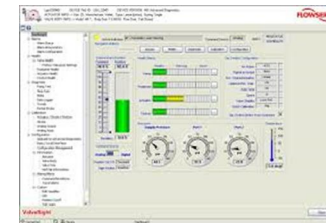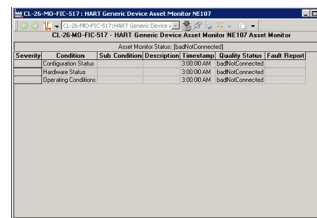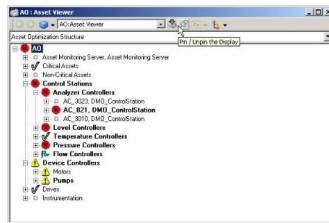
- All devices are monitored automatically without any maintenance supervision
- Criticality is not used to organize equipment
- If the DTM is not used to acknowledge the failure alert the status is kept all the time

- Only device vendor specific alerts
- Many alerts are after the failure
- Some alerts are too close to point of failure (PF)
- It is not possible interact with the monitoring adding plant maintenance experience

- Threshold limits configured inside the DTM
- Maintenance needs 800xA permissions to access DTM
- Maintenance team have no access to DTM to acknowledge alerts due plant security reasons and to setup threshold limits due plant security reasons

Practical results of a tool without maintenance engineering:
- Not use all potential of AO and smart device
- Maintenance does not have access to this tools
- All stakeholders upset

Plant Asset Management
Production Equipment

1. Essentials Package
Implement dashboards for a *holistic view* of conveyor health and its sub-components.

Conveyor Belt

3. Rotating Machine Package
Integrate existing condition monitoring systems, *break up information silos*

Electrical	Automation	Mechanical
Transformer	Control Loop	Gearbox
Motor	IO Module	Belt
Drive	Controller	

2. Automation and Electrical Package
Make use of the technology already installed, improve the *return of investment - ROI*

4. Production Equipment Package
Add new monitoring solutions, *continuous improvement*

Plant Asset Management
Digester Asset Monitor

- Study of the operation manual;

- Study of P & ID;

- Conversation with operation and automation personnel to detail operational routines, process parameters and known fault patterns;

- Elaboration of the FTA;

- Validation of FTA with operation and automation personnel;

- Construction of the algorithms;

Power and productivity
for a better world™

ABB
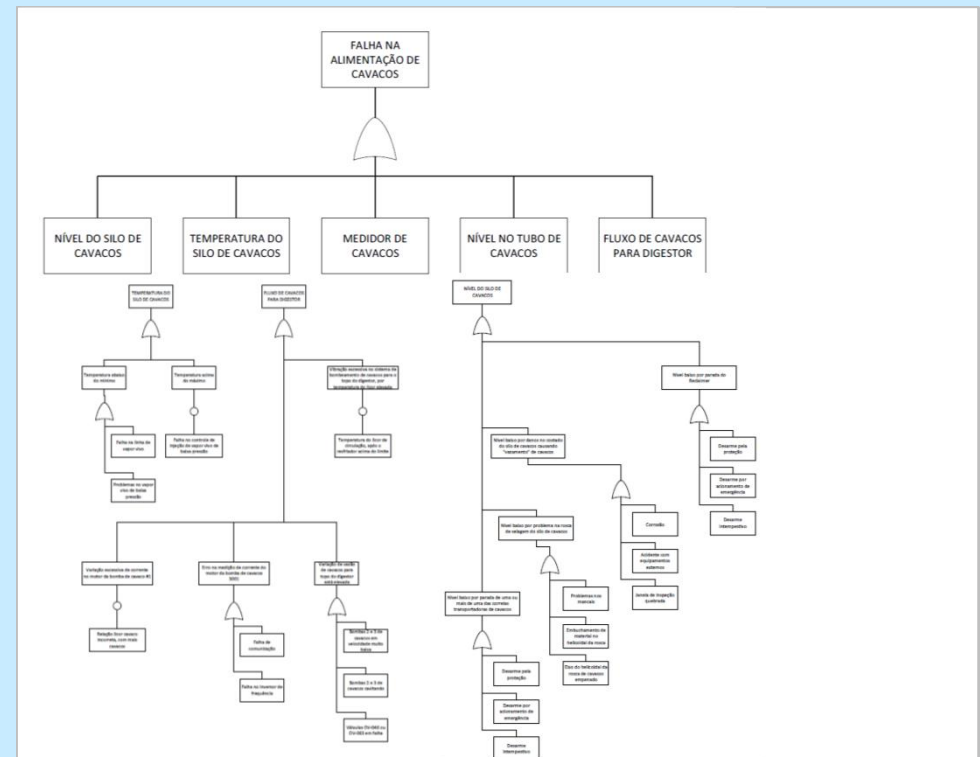
Pareto plot of H1 Digester occurrences after adjustment of parameters
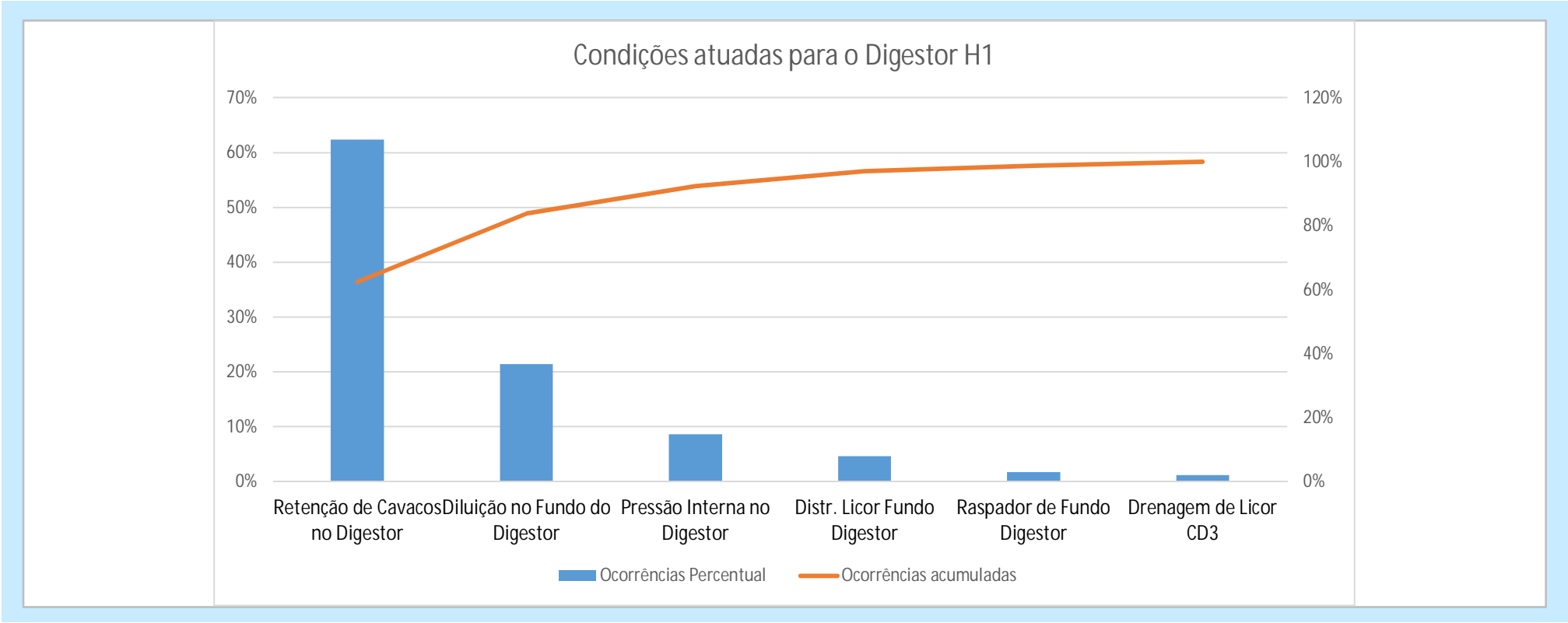
Condições atuadas para o Digestor H1

Detailing the occurrences of the H1 digester after adjusting parameters

Condition	Sub Condition	Cause	Problem
Digestor chip retention	Impregnation time greater than specified	Level LT-073 above limit (80%)	Digester Feed Control
Dilution at the bottom of the digester	Horizontal or vertical dilution problem at bottom of digester	High bottom scraper torque and differential pressure at high digester discharge	Clogged horizontal and vertical wash liquor feed tubes
Internal digester pressure	Failure to raise internal pressure	Low PT-110 pressure and closed PV-110A valve	Control failure (Valve in good operating condition already checked in another sub-condition)

Detailing the occurrences of the H1 digester after adjusting parameters

	Condition	Sub Condition	Cause	Problem
	Distribution of liquor in the bottom of the digester	Distribution of liquor in the bottom of the digester is inconsistent	Relation of flow between FT-079 and sum (FT-079; 082; 084; 085) different from the standard	Control Instruments and Valves Note: Standard = 66%, but is working between 70% and 79%.
	Digester bottom scraper	Deficiency in equipment at the bottom of the digester	Bottom bottom scraper torque and differential digester discharge pressure below the maximum limit	Fault in hydraulic system Mechanical failure in scraper
	Drainage of liquor from CD3 sieves	Clogged CD3 screens	Digester bottom differential pressure above limit	Accumulation of solids Damaged sieves

Detail of problem found on the bottom scraper hydraulic unit

- The bottom scraper oil pump motors operate 2 in 3;

- They must operate with a similar current between them;

- Operating with high current difference between 3004 and 3006 oil pump motors.

- 3006 motor with 45% current greater than 3004, indicating problems with pump 3006.
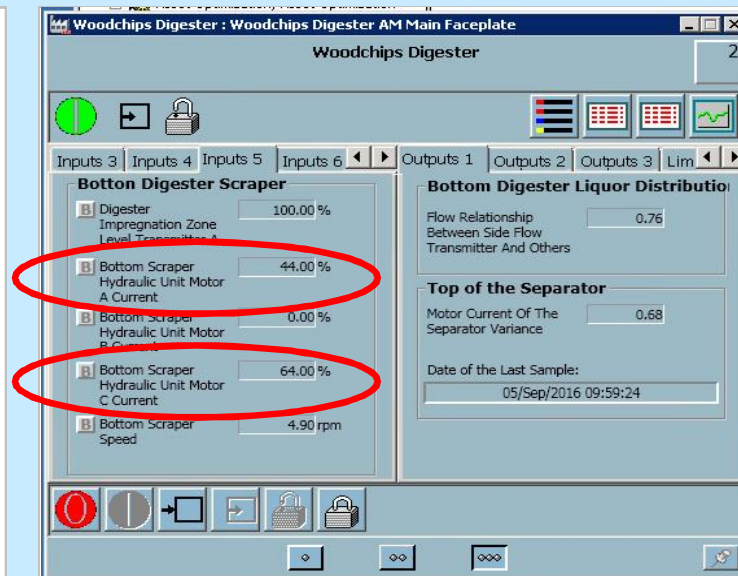
Detail of problem found on the bottom scraper hydraulic unit
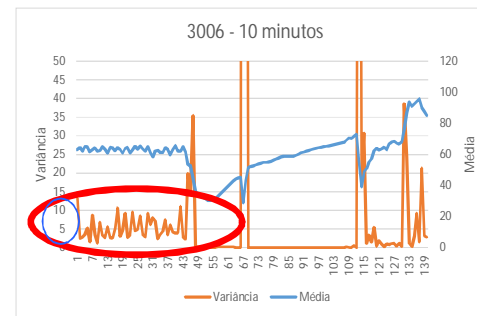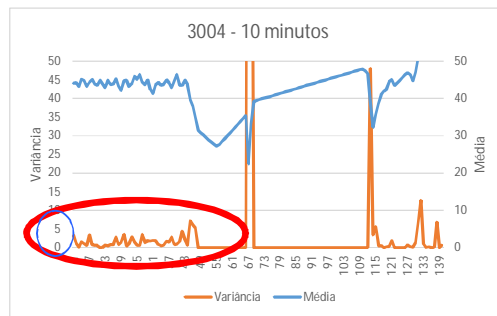
- Current difference between oil pump motors for bottom scraper 3004 and 3006;
- Oil pump motor chain for bottom scraper 3006 with large variance (between 5 and 10) relative to motor 3004 (between 0 and 5).
- Data from 01 to 29 August 2016, collected by PIMS, were used every 60 seconds.

Monitoring of digester variables - Bottom scraper torque

- Graph showing variation of torque, speed, pump motor current 3004 and 3006, chip level LT-073A and differential pressure in the digester discharge.

- As the chip level (4) rises above the 80% limit, the touch (1) rises, as well as the differential pressure in the digester discharge (2) and the current in the bottom scraper oil pumps (3). And 5) and the speed of the scraper (6) decreases.

Power and productivity
for a better world™
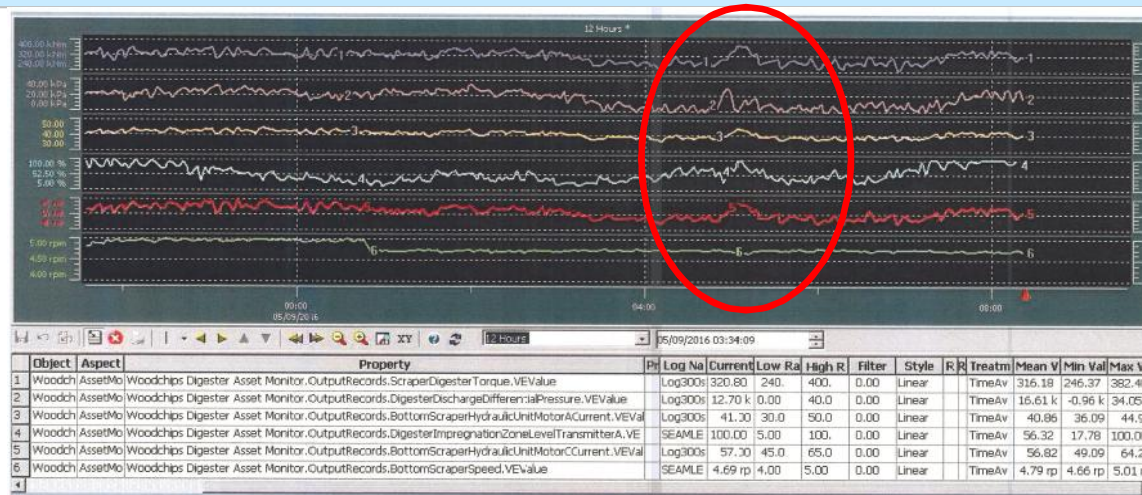
Monitoring of digester variables - Digester pressure

Graph showing, among others, the internal pressure variation of the digester (3), the position of the digester pressurizing valve (4), level transmitter in the digester (5) - LT-073A and the position of the digester depressurizing valve

Power and productivity
for a better world™

ABB
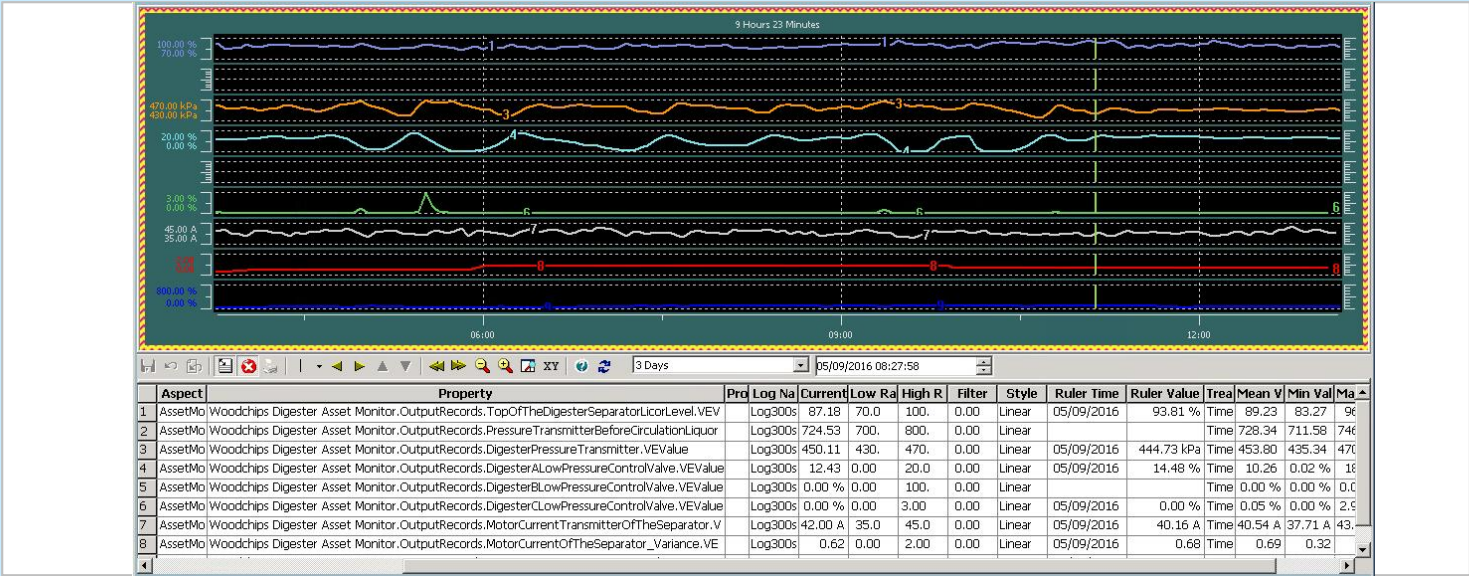
Monitoring of digester variables - Digester pressure

The variation in the pressure control of the digester can be checked and the pressurizing valve closes 5 times over a period of 6.5 hours.

It is also observed that the valve works between 0% and 20%, which suggests that it is oversized.

The instrumentation air pressure measurement, which is used to pressurize the digester, is being implanted. This will allow better diagnosis and analysis of the situation.

Operating parameters - Sieves of CD1 and CD2 regions

At the beginning of the monitoring, the system detected obstruction of the sieves of CD1 and CD2, but it was reported that the operational parameters of sieving had changed since the interviews with the operators.

For CD1 the limits were between 400 and 630 m3 / h and for CD2 they were between 700 and 1000 m3 / h, according to information received

For this reason, the values recommended by the manufacturer from 4m3 / h for CD1 and 9m3 / h for CD2, under nominal production conditions, were changed to 2,5 m3 / h and 4,5 m3 / h, respectively.

Transform your maintenance

A scalable **solution** to sustain and improve the **maintenance performance** of a mine by **accessing** previously untapped asset data and then **compiling** and **present** it efficiently.

Value

AssetVista Packages

Maintenance Excellence
Maintenance process change initiated by analytics derived information

EAM Integration
Execution, leveraging real and near-real-time data

Essentials
Dashboards with real time asset data

Reports
On Demand Asset Management Report

Maintenance Assessment
Long Term Asset Management Plan

800xA System
Data stored, secured and available

Condition Monitoring
Automation, IT & network, instrumentation, electrical, static equipment, rotating machine, production equipment

Time

Summary
Plant Asset Management

It's all about maintenance!

- Optimize and sustain your maintenance performance

- Avoid useless maintenance and improve time to repair

- Access to ABB mining and maintenance expertise

- Prevents unnecessary exposure to hazardous areas

- Quick and qualified decision-making process

- Solution that best fits your maintenance strategy

- Operation and maintenance share the same platform

Power and productivity for a better world™
ABB

Power and productivity
for a better world™

ABB

125
YEARS IN
SWITZERLAND
www.abb.com

ABB Asset Management Portfolio

Customer Environment		ABB Asset Management Portfolio					
ERP	Finance	**Elipse**					
	Supply						
	EAM						
CPM	APM	**Decathlon**	**Asset Health Center**	**KM Knowledge Management**			
	PIMS						
	LIMS			**CClass**			
	PAM	**800xA AO**	**AssetVista - Plant Asset Management Services**				
Control System	**HMI**	**System 800xA**				**ServicePort Expert Channels (SaaS)**	**Conveyor Fit**
	Control						**GMD Fit**
	IO		**Motor Machsense**	**GIS CBS Sentinel**	**Wireless**		**Hoist Fit**
	Sensor		**Drive Monitor**	**Transformer TEC**	**Machinery MCM 800**		**Services**
	Device						

ABB

Basic Process

Implementation

Assessment	Solution design	Commission	Monitoring	Improvement
• Perform kick-off meeting, presenting agenda, purpose and process overview. • Apply questionnaire and validate results validation. • Analyze results and prepare report.	• Classify assets criticality (A,B or C). • Identify production bottlenecks. • Define equipment to be monitored by AssetVista. • Indicate/select which field signals will be connected to Asset Monitors. • Establish which Conditions will be identified through logical treatment of available signals. • Design equipment tree/structure. • Specify functional design, servers and workstations, interfaces and CMMS integration.	• Install / commission operational system (Windows Server). • Install / commission DCS 800xA. • Configure remote access. • Install / commission AO server. • Configure PLC Connect feature. • Address data in DCS. • Address data in MCS. • Install AssetVista library. • Build hierarchical structure @ Asset Structure. • Build hierarchical structure @ Control Structure. • Commission Asset Monitors. • Commission Dashboards. • Configure Workplace.	• Evaluate trends and variations. • Compare occurrences and reports outputs. • Send detailed report on a weekly basis.	• Tune Conditions and Severity parameters. • Set new Conditions based on reported occurrences. • Configure/define new field signal inputs. • Define new assets to be monitored.

Basic Process

Continuous improvement

Improvements / enhancements
- Tune Conditions and Severity parameters.
- Set new Conditions based on reported occurrences.
- Configure/define new field signal inputs.
- Define new assets to be monitored.

Design
- Indicate/select which field signals will be connected to Asset Monitors.
- Establish which Conditions will be identified through logical treatment of available signals.

Monitoring
- Evaluate trends and variations.
- Compare occurrences and reports outputs.
- Send detailed report on a weekly basis.

Implementation
- Review hierarchical structure @ Asset Structure.
- Commission Asset Monitors.
- Review Workplace.

ABB