



OSIsoft.

REGIONAL SEMINAR

E M E A

2022



Do “More with Less” using PI AF & PI Notifications

Presented by

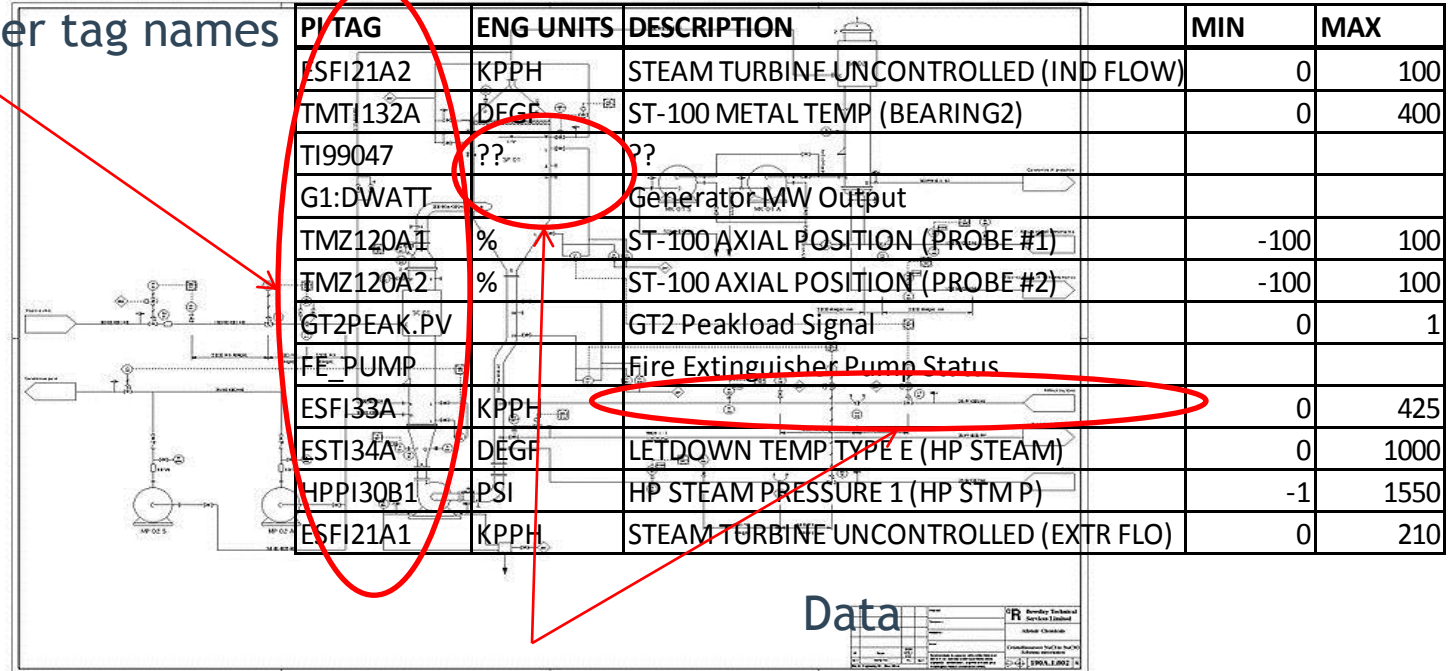
Frank Batke
Ravi Shettar

People Think in Terms of Assets



Relate Your Assets to Your Data

Difficult to decipher tag names



PITAG	ENG UNITS	DESCRIPTION	MIN	MAX
ESFI21A2	KPPH	STEAM TURBINE UNCONTROLLED (IND FLOW)	0	100
TMT132A	DEGF	ST-100 METAL TEMP (BEARING2)	0	400
TI99047	??	??		
G1:DWATT		Generator MW Output		
TMZ120A1	%	ST-100 AXIAL POSITION (PROBE #1)	-100	100
TMZ120A2	%	ST-100 AXIAL POSITION (PROBE #2)	-100	100
GT2PEAK.PV		GT2 Peakload Signal	0	1
FE_PUMP		Fire Extinguisher Pump Status		
ESFI33A	KPPH		0	425
ESTI34A	DEGF	LETDOWN TEMP TYPE E (HP STEAM)	0	1000
HPPI30B1	PSI	HP STEAM PRESSURE 1 (HP STM P)	-1	1550
ESFI21A1	KPPH	STEAM TURBINE UNCONTROLLED (EXTR FLO)	0	210

Data

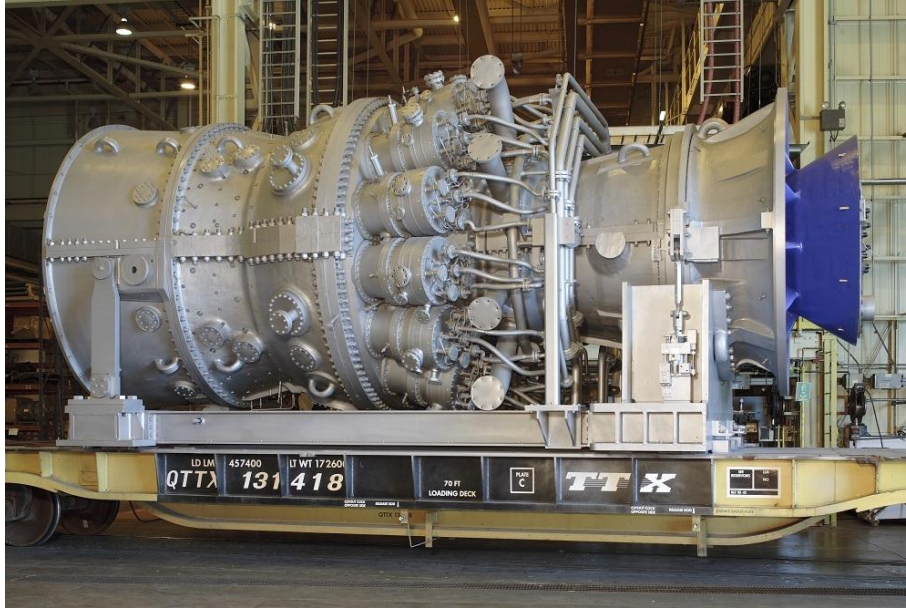
Missing or incomplete data - difficult to find what you need

PAID

Build a Complete Picture of Your Asset

PI Tags

- Inlet pressure
- Inlet flow
- Ambient temperature



PI Tags

- Exhaust temperature
- Exhaust flow
- Measured MW output

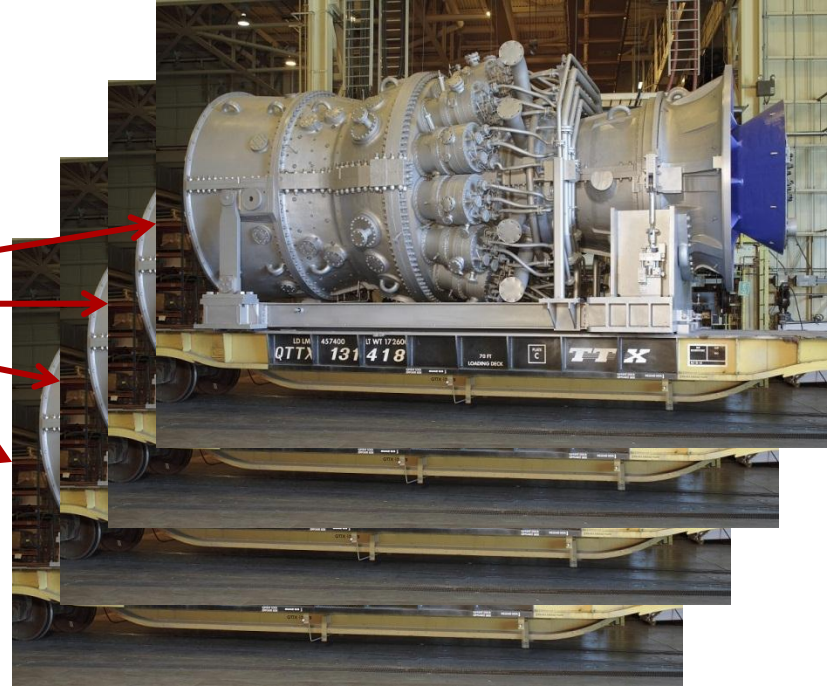
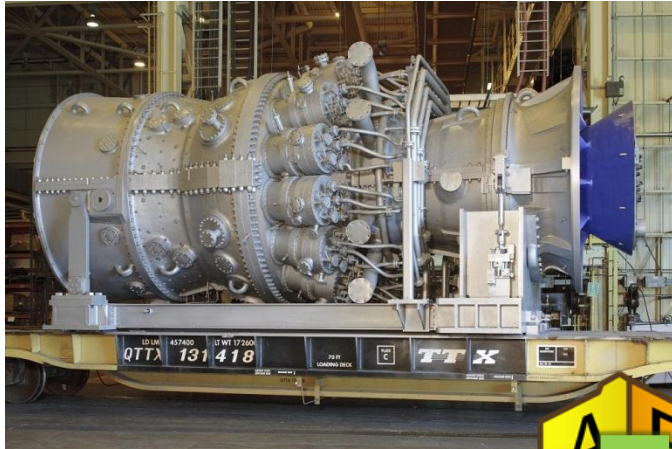
External Databases

- Performance curves
- Last service date
- Design documents
- Inspection best practice

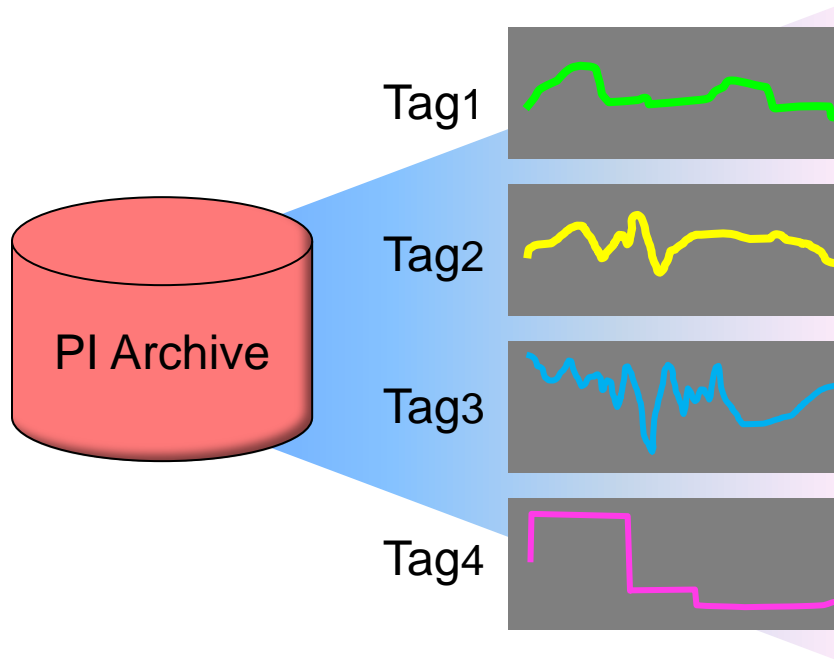
Calculations

- Performance calculations
- KPI's

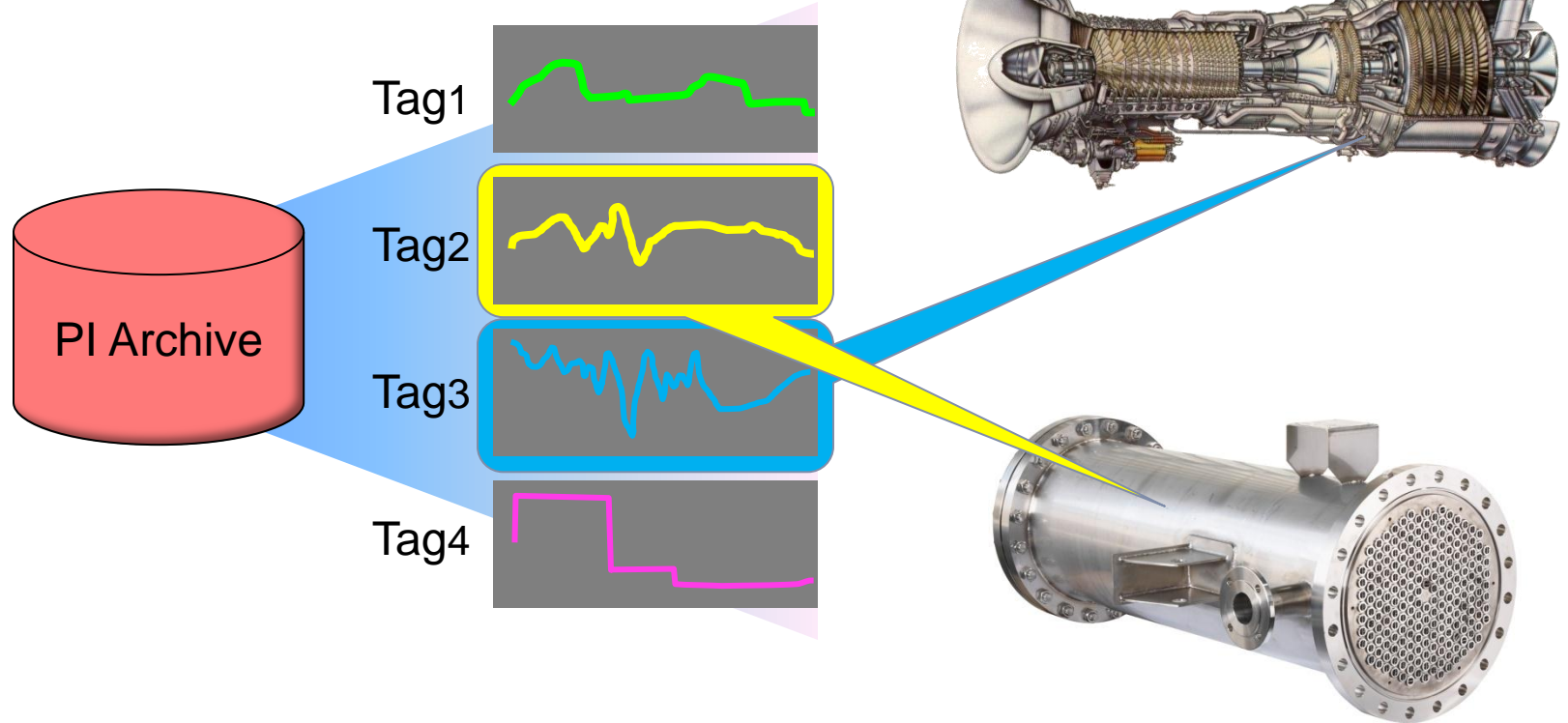
Common View for Similar Assets



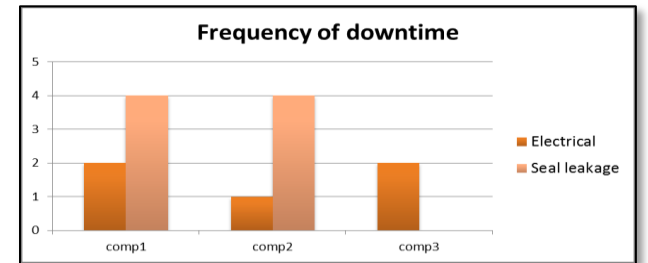
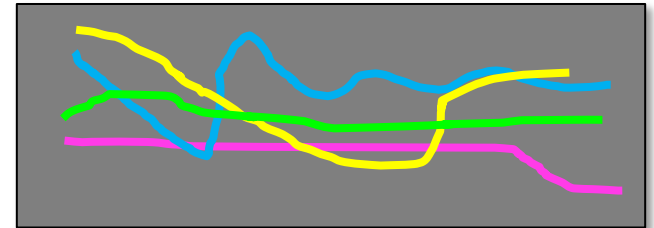
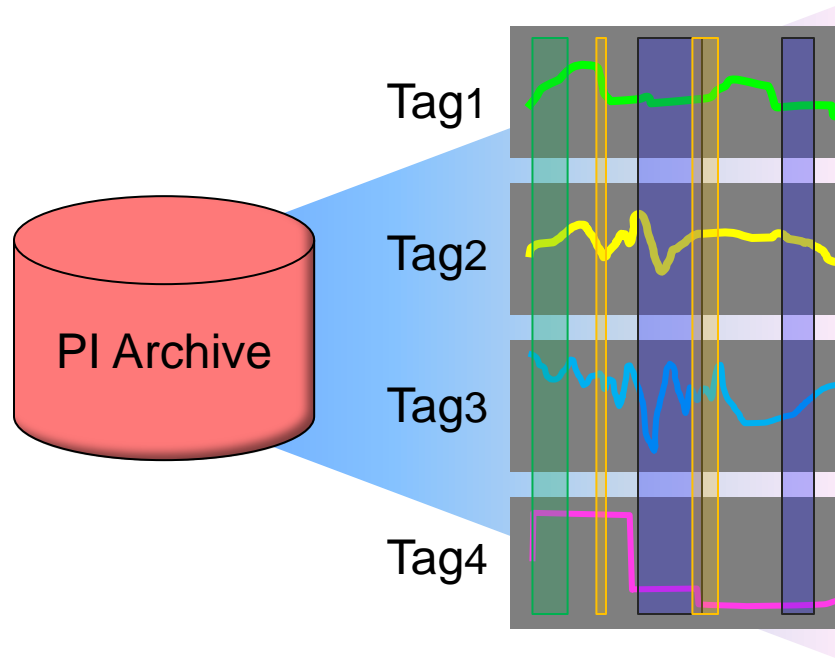
PI Server – Time series data and Tags



Assets help you find the right Tags



Event Frames help you find the right time periods



Asset centric

- Data structured and organized by asset
- Spans multiple PI Systems
- Incorporates non time series data

Non Time Series Data Sources

PI AF

Asset-Equipment Centric access to the Data

Honeywe

SCM

RDBMS

MES

Add Value to your PI System

UC2011-SK - PI System Explorer

File Edit View Go Tools Help

Elements

Elements

- Big Creek Power Plant
 - Condenser
 - Gas Turbine 1
 - Gas Turbine 2
 - HRSG 1
 - HRSG 2
 - Steam Turbine
- System Configuration

Event Frames

Library

Unit of Measure

MyPI

Notifications

Contacts

28 Attributes

Prices

Electricity Price

Gas Fuel Price

Oil Fuel Price

Power Factor

Name	Value
Compressor Discharge Pressure	16.2847557067871 bar(g)
Compressor Discharge Temperature	433.991912841797 °C
Compressor Inlet Temperature	19.9780979156494 °C
Exhaust Gas Pressure	0.0206421613693237 bar(g)
Exhaust Gas Temperature - #...	594.774108886719 °C
Exhaust Gas Temperature - #...	597.018737792969 °C
Exhaust Gas Temperature - #...	595.317443847656 °C
Exhaust Gas Temperature - #...	598.902770996094 °C
Fuel Oil Flow	-0.0620765015482903 m3/h
Fuel Oil Pressure	15.818398475647 bar(g)
Fuel Oil Temperature	33.3455696105957 °C
Gas Fuel Flow	70317.8671875 m3/h
Gas Fuel Pressure	36.21142578125 bar(g)
Gas Fuel Temperature	68.7641372680664 °C
Gas Turbine Speed	3000.62158203125 rpm
Gross MW Output	261.549621582031 MW
In Service Date	2/25/2009 12:00:00 AM
Inlet Guide Vane Angle	95.78909 %
Inlet Pressure Loss	1.60181736946106 mbar(g)

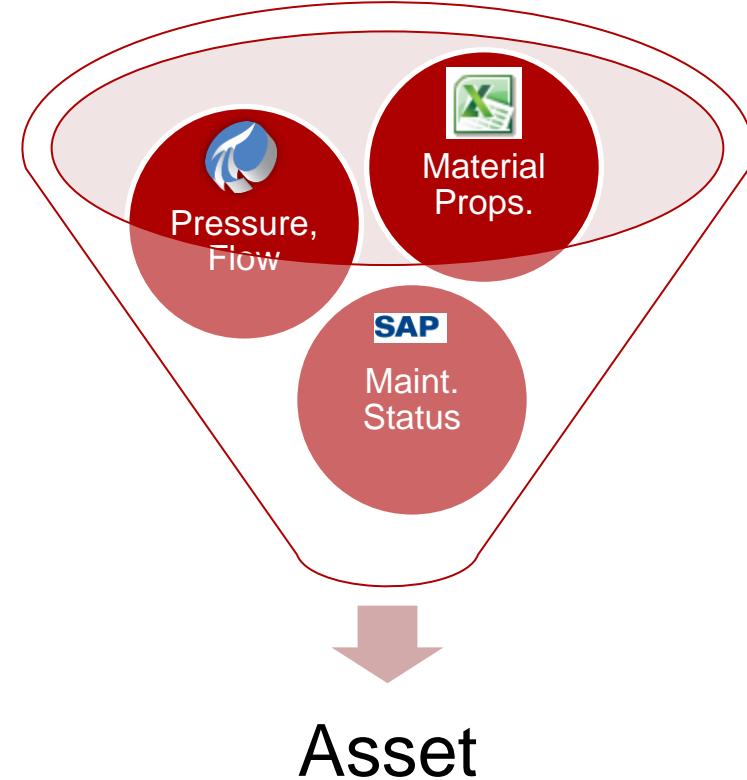
Big Creek Power Plant

- Condenser
- Gas Turbine 1
- Gas Turbine 2
- HRSG 1
- HRSG 2
- Steam Turbine

System Configuration

Add Value to your PI System

- **Tie asset properties to your data**
 - Static values, PI Tags from multiple PI Servers, static or linked Tables
 - Custom data references to other data sources



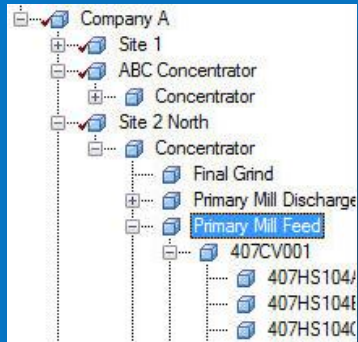
Contextualization

- PI AF provides a **configurable and flexible data abstraction model** to help different users **easily find information** they need to make decisions

PI AF

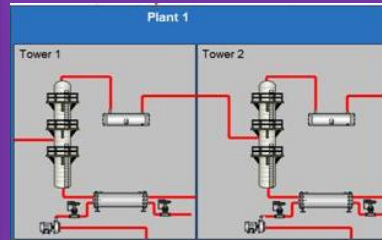


Physical / Logical



Element Hierarchy

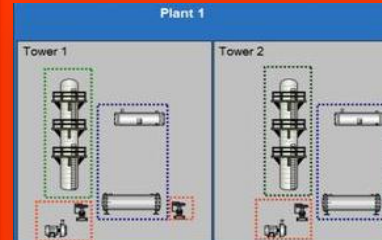
Process Connectivity



Models

Role

***Pumps
Used in Report
Critical Parameters
Batch Info***



Categories

Event / Time

Name	Start Time	End Time	Reason Code
Gas Turbine 1 Downtime Event...	2/28/2011 4:00:00 PM	2/28/2011 4:15:00 PM	Seal Leakage
Gas Turbine 2 Downtime Event...	2/28/2011 4:00:00 PM	2/28/2011 4:30:00 PM	Mechanical
Gas Turbine 1 Downtime Event...	3/1/2011 5:00:00 PM	3/1/2011 5:15:00 PM	Seal Leakage

Event Frames

Associated Info

Name	Value
Meter Alarming	
High Amps	1500 A
High Voltage	245 V
Low PF	90 %
Meter Configuration	
Contracted Amps	150 A
Coordinates	
Installation date	1/1/2007 12:00:00 AM
Last inspection	1/1/2007 12:00:00 AM

Attributes

PI Notifications



COLLECT



HISTORIZE



FIND



ANALYZE



DELIVER



VISUALIZE

- Architecture
- Base Concept
- Use Case

PI Notifications

- Filter and analyze the ever increasing data streams in real time
- Communicate important events to applications, systems and targeted audiences
- Leverage these events in the PI Client Tools for further analysis



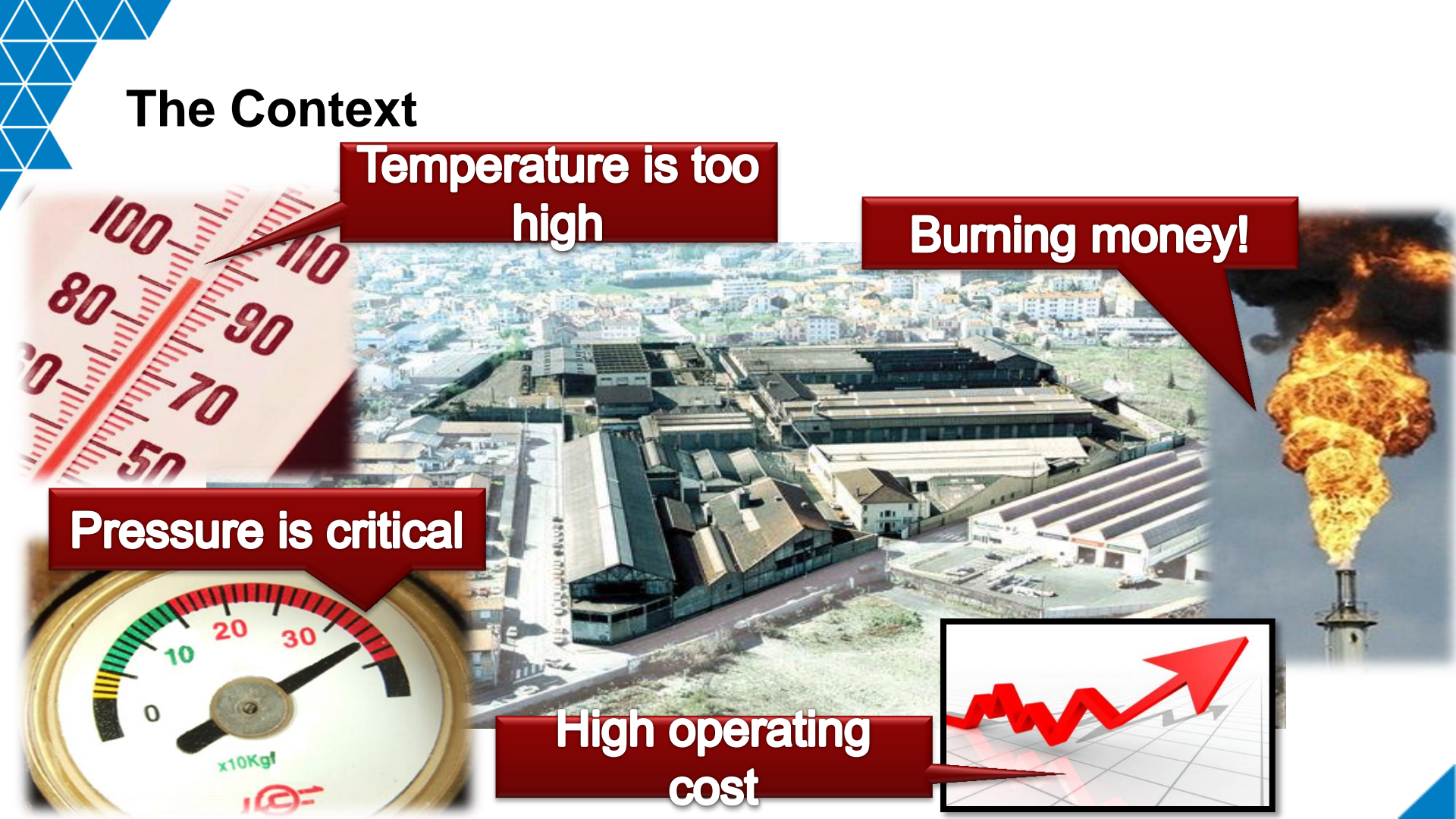
The Context

Temperature is too high

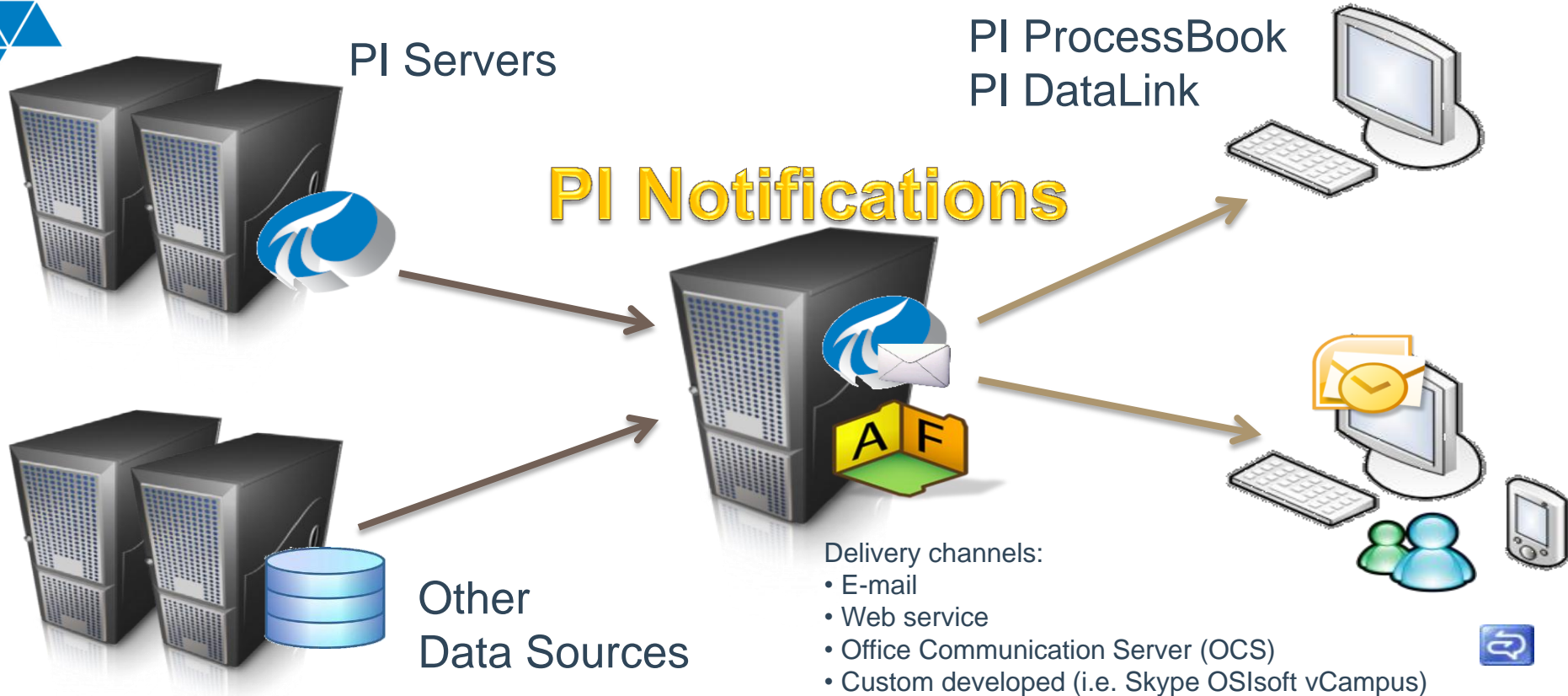
Burning money!

Pressure is critical

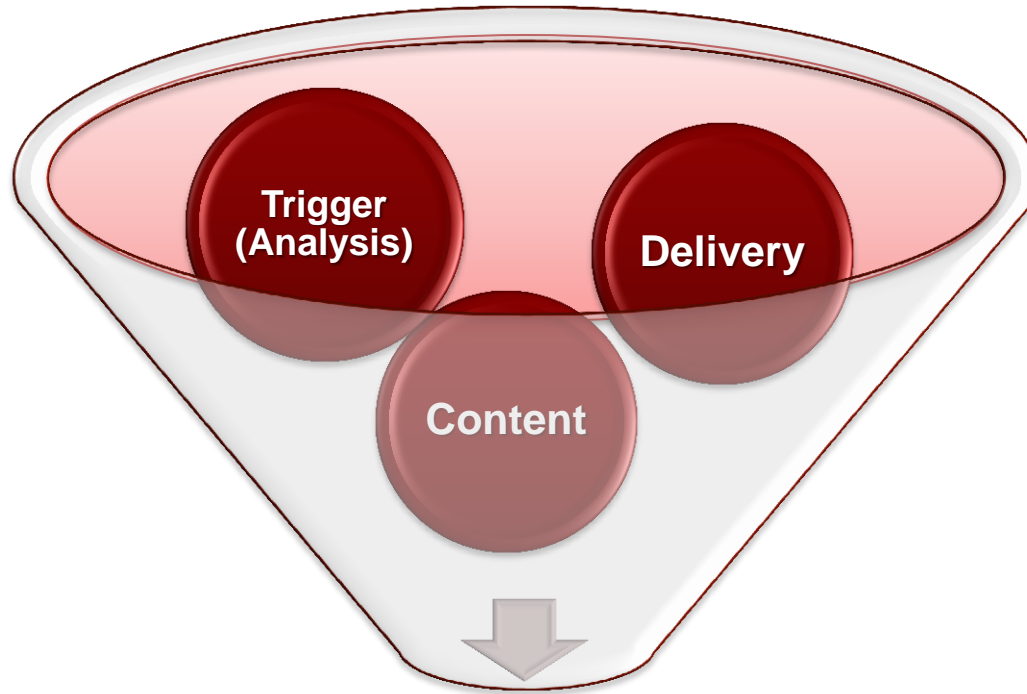
High operating cost



PI Notifications Architecture



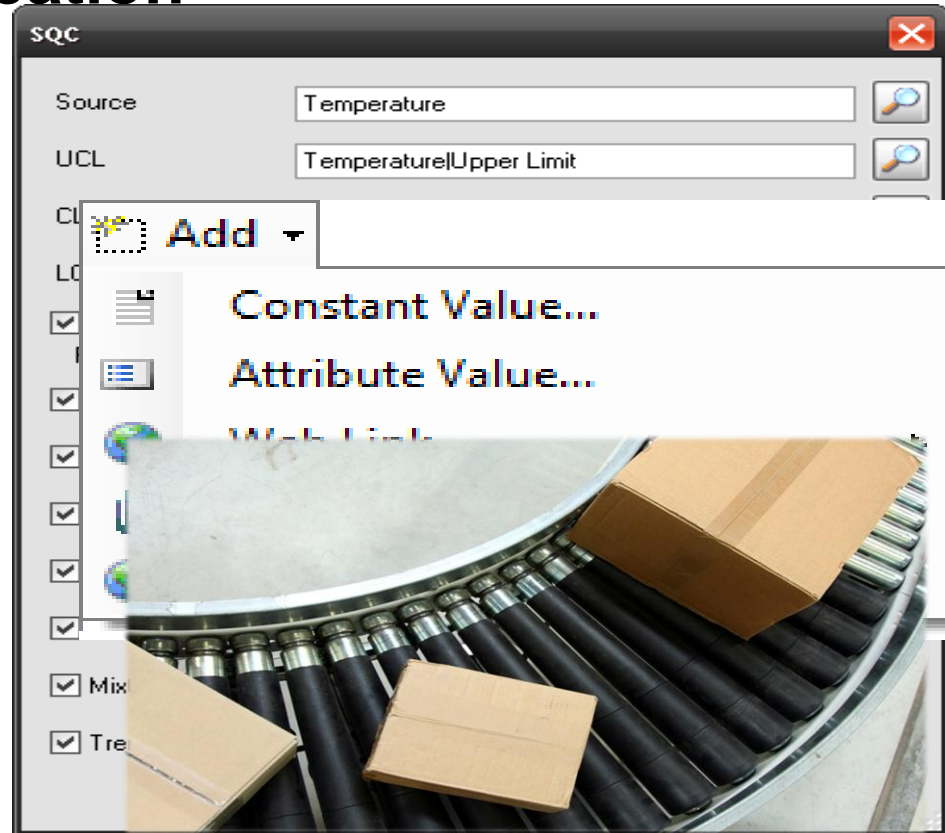
Base Concept of a Notification



Notification

Base Concept of a Notification

- Trigger Conditions
 - Comparison
 - SQC
 - Performance Equations
- Content
 - Standard content of a notification
 - Additional configurable content to make problem solving and decision making processes easier
- Delivery
 - Provide the content to applications/systems/audiences
 - Delivery channels: e-mail/Web service/Office Communicator...



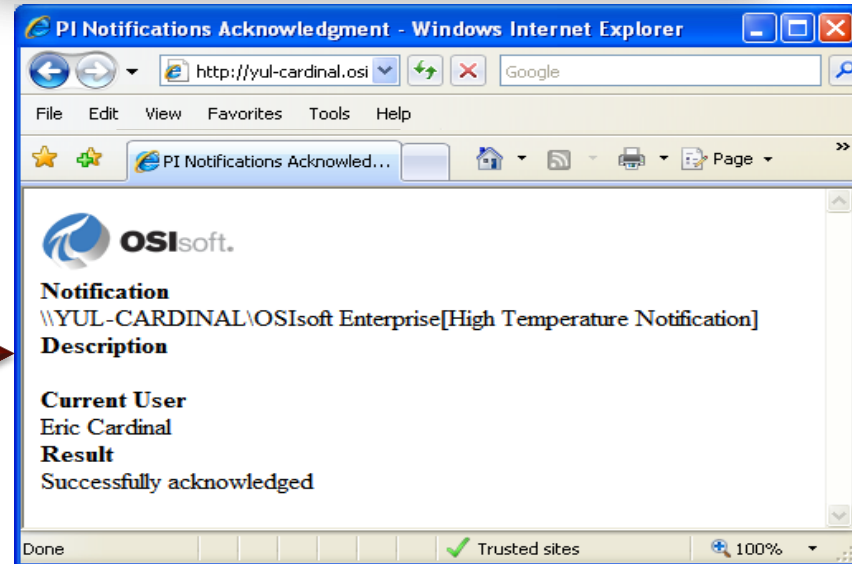
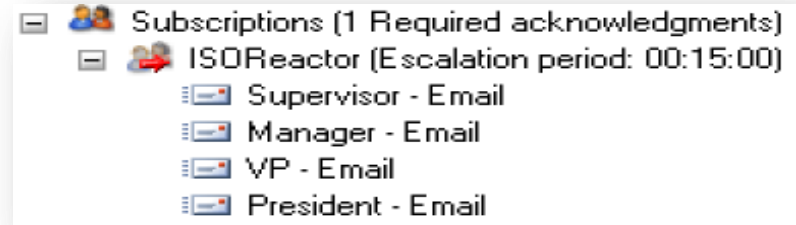
Additional features of PI Notifications

- Acknowledgement
- Escalation team
- Persist history of triggered conditions, duration, acknowledgement method and comments
- Notification template

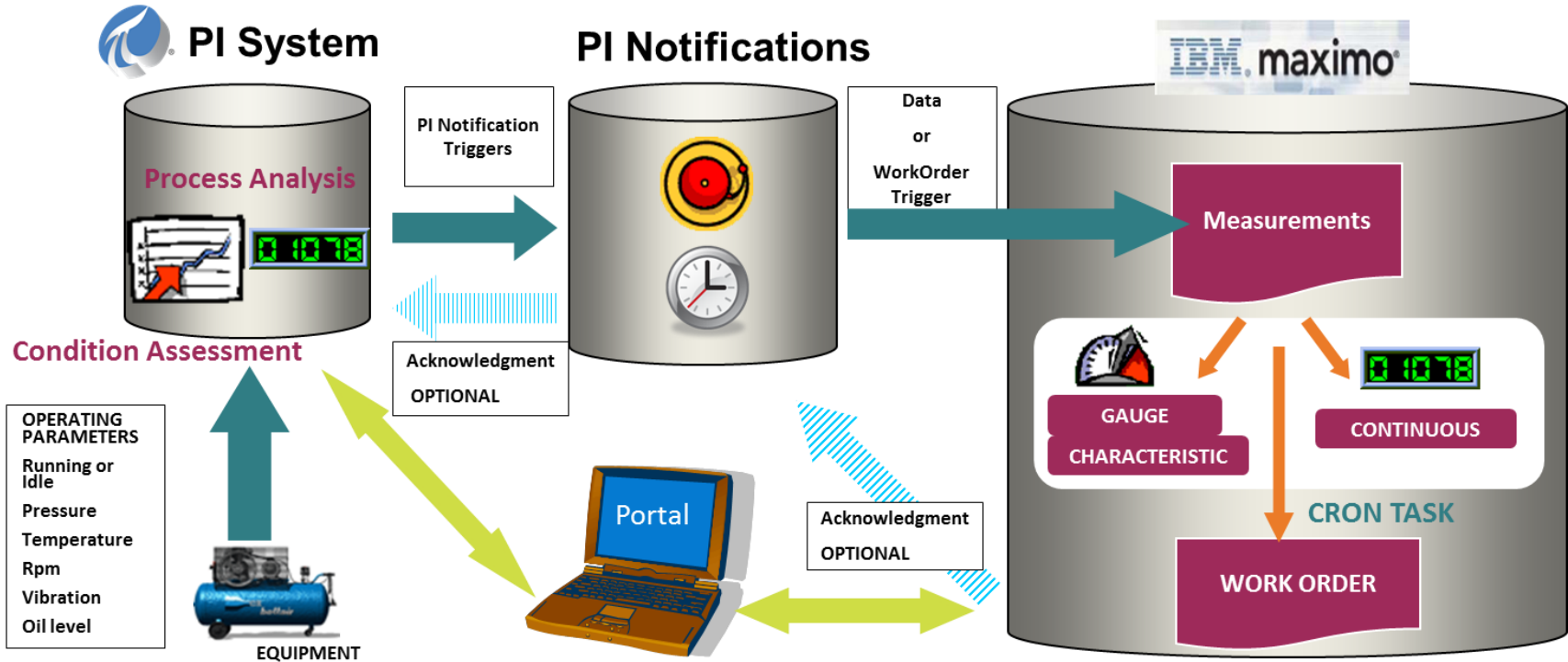
Actions:

[Acknowledge](#)

[Acknowledge with comment](#)



PI AF, PI Notifications, PI Data Access



Case Study – Appleton Papers Inc.

- Focused on production of technical papers, performance packaging and encapsulation
- World's largest producer of carbonless paper
- OSIsoft products
 - 3 PI Servers with PI ACE
 - Centralized PI AF and PI Notifications server
- Practical approach
 - Exception management
 - Capitalize on employees knowledge and experience

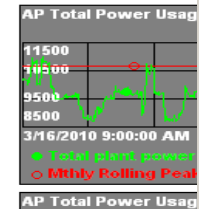
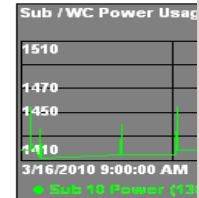
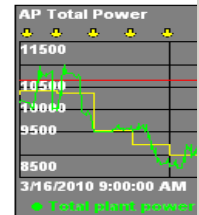


APPLETON

APPLETON

- Energy management
- Supplier
Wisconsin Energy (WE)
- Notification when power consumption reaches 90 % of known peak value
- Peak analysis
- Demand Response Program with WE
 - Cost reduction
 - WE can interrupt supply

Current Plant Total Power
10970 KW
3/16/2010 3:15:00



APIProd - PI System Explorer

File View Go Tools Help

Database Query Date Back Check In

Notifications

New

- AP CM18 Machine Down
- AP CM18 Machine Down For Extended Period
- AP CM18 Machine Thread
- AP CM19 Machine Down
- AP CM19 Machine Thread
- AP CM19 Reel Turnup
- AP CM19 Unwind Bs Wt Status
- AP CM19-2B R1 Color Flow Meter Fault
- AP CM19-2B R1 Surfactant Flow Meter Fault
- AP CM19-2B R2 Color Flow Meter Fault
- AP CM19-2B R3 Color Flow Meter Fault
- AP CM19-2B R3 Surfactant Flow Meter Fault
- AP CM19-2B R4 Color Flow Meter Fault
- AP CM19-2B R4 Surfactant Flow Meter Fault
- AP Power Bit # 1 - Fault On SwitchGear PLC
- AP Power Bit # 2 - WE Pwr Interruption within 1 hr
- AP Power Bit # 3 - WE Pwr Interruption within 5 minutes
- AP Power Bit # 4 - WE Pwr Interruption Trip
- AP RE37 Machine Down For Extended Period
- AP RE38 Machine Down For Extended Period
- AP RE44 Machine Down For Extended Period
- AP SH16 Machine Down
- AP SH17 Machine Down
- AP SH18 Machine Down
- AP SH19 Machine Down



Thank you

