



Safety Insights – How to make Operations Manager's Life Easier

Ana Paula Brambila

Software Development - Brazil SW Lab

Agenda



- Notes
- Purpose of the Proof of Concept
- General Overview of Safety Work Centers
- Safety Definitions
- Operations Manager *persona*
- Supported Integrations
- Main Work Centers Screens



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Purpose of Operational Safety Work Centers



Development of a “Proof of Concept”

- O&G and HSE next releases roadmap
- Explore the design of O&G and HSE *personas* through Lightning work centers (ex. Operations Manager, HSE Manager)
- Explore use cases connecting Maximo and IoT
- Start point to promote debate and get insights from customers

Maximo Operational Safety Work Centers

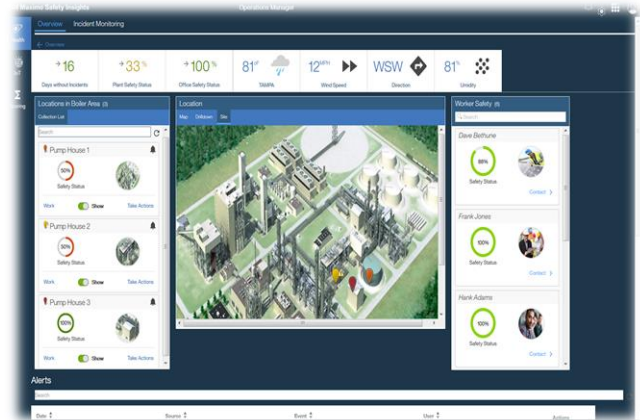


- New work center on the top of Maximo Lightning

- *Operations Manager as persona*

- Promote the *Perception of Safety*

- Management of risks associated with process and occupational health and safety

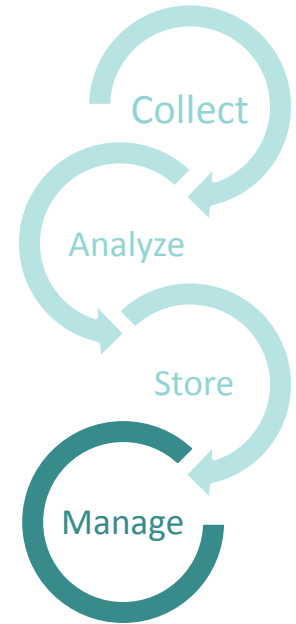


Maximo Operational Safety Work Centers



Insight on risks:

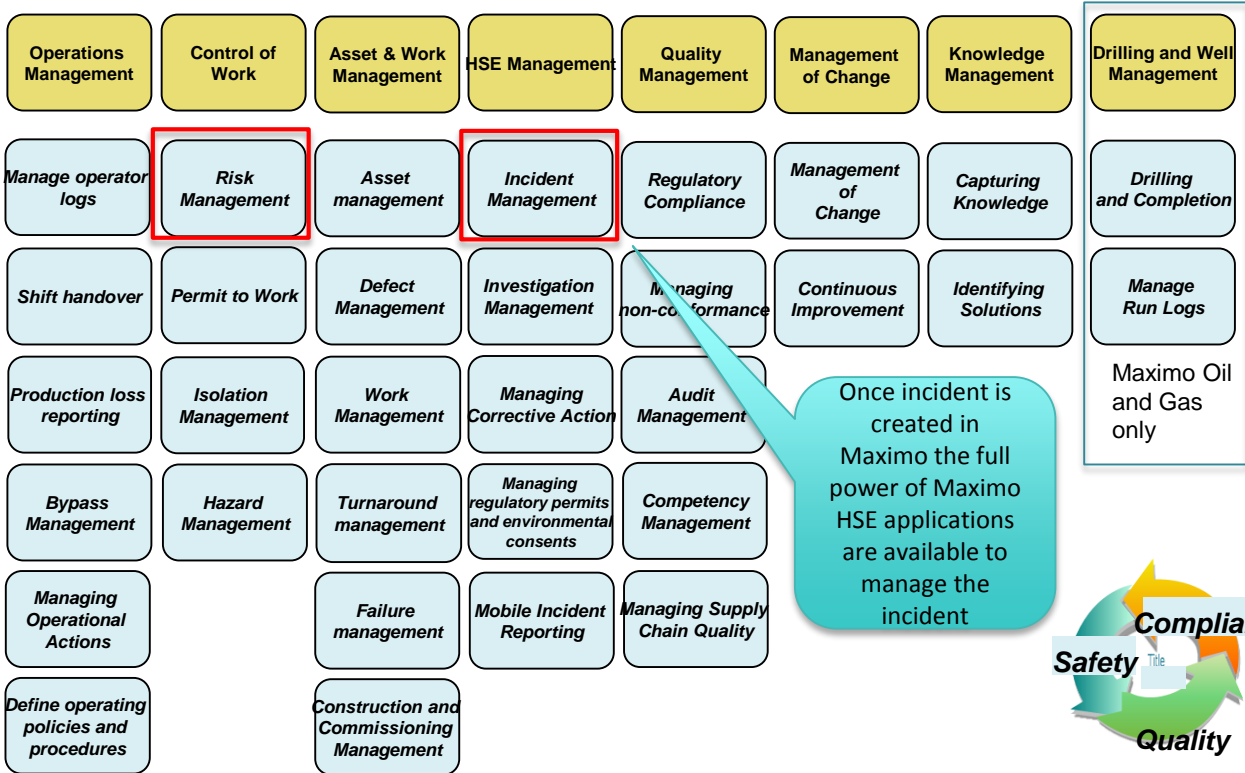
- Information held in Maximo safety related applications
- Directly from devices by supporting Internet of Things connectivity with the IBM Watson Cloud Platform



Maximo O&G/HSE Manager business processes



Major Business Processes



Detailed Business Processes

Once incident is created in Maximo the full power of Maximo HSE applications are available to manage the incident



Definitions



1. Process safety covers the management of major accident hazard risks such as loss or containment or chemical release to which organizations involved in managing major hazards may be exposed. Also sometimes referred to as asset integrity.

2. Occupational Health and Safety covers the management of personal safety in the workplace. There are two main components to this

- Occupational injury resulting from a work related activity
- Occupational illness caused by factors associated with employment

Teresa Martins, Operations Manager



Tools and Abilities

Access to sensor data monitoring environmental condition of the plant and the worker's health status.
Access to Maximo O&G to manage incidents and start investigation processes.



"I would like to have the overall safety control of the plant I manage."

Thinking Process



Motivation

Increase the awareness of operational risk.

Frustrations

Cannot quickly correlate the great amount of data from different sources and systems.

Tasks

- Ensure that all workers under her management attends the conditions of work established by standards and procedures
- Ensure all the Assets and Locations under her supervision are safe.

Initial screen after login



IBM Maximo Safety Insights Operations Manager

Overview Incident Monitoring

Health

IoT

Scoring

KPI + Add Cards

Saved Query + Add Cards

All 177 Location

Locations in Boiler Area 3 Location

Use to provide a standard set of queries to drive dashboard

About

Overview screen



Overall safety related KPIs

Weather data for dynamic risk

Process safety status by location

Worker safety status coming from wearables

Overview screen with drilldown option selected



→ 16

Days without Incidents

→ 33%

Plant Safety Status

→ 100%

Office Safety Status

81°F



TAMPA

12MPH



Wind Speed

WSW



Direction

81%



Humidity

Locations in Boiler Area (3)

Collection List

Search

Show Number Of Results 50

Pump House 1

50%

Safety Status



Work Show

Take Actions

Pump House 2

50%

Safety Status



Work Show

Take Actions

Pump House 3

100%

Safety Status



Work Show

Take Actions

Location

Map Drilldown Site

- (14%) WATER: Potable Water System
 - (14%) TWC: The Water Company
 - (14%) WELL FIELD 5: Well Field 5
 - (14%) PUMPHOUSE3: Pump House 3
 - (14%) AH003: PUMP VERTICAL TURBINE, HS 3 VERTICAL TURBINE PUMP,
 - (51%) WELL FIELD 1: Well Field 1
 - (62%) PUMPHOUSE2: Pump House 2
 - (62%) AH002: PUMP VERTICAL TURBINE, HS 2 VERTICAL TURBINE PUMP,
 - (32%) WELL FIELD 4: Well Field 4
 - (32%) PUMPHOUSE1: Pump House 1
 - (32%) AH001: PUMP VERTICAL TURBINE, HS 1 VERTICAL TURBINE PUMP

Drilldown view or map view can also be selected

Worker Safety (6)

Search

Dave Bothune

88%

Safety Status



Contact >

Frank Jones

100%

Safety Status



Contact >

Hank Adams

100%

Safety Status



Contact >

Alerts

Search

Date

Source

Event

User

Actions

Alert List and Actions



IBM Maximo Safety Insights

Operations Manager

Work Show Take Actions

Control

Alerts

Search

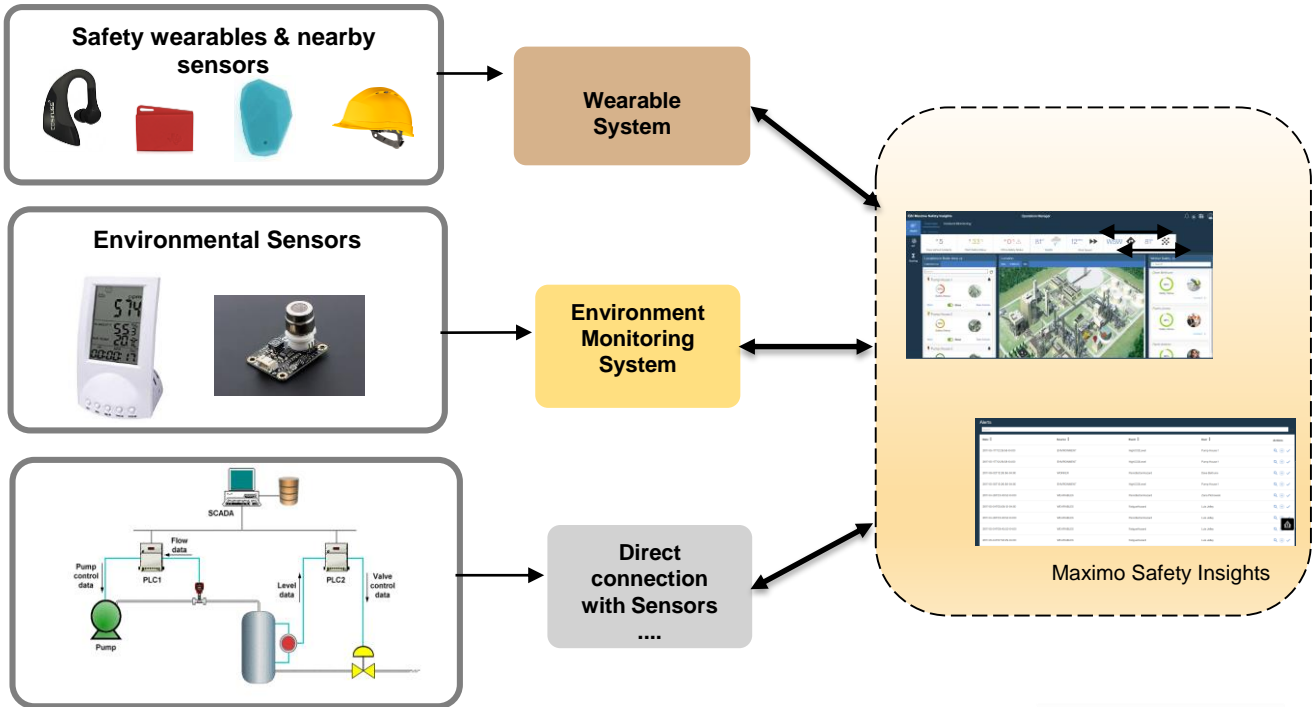
Date	Source	Event	User	Actions
2017-05-17T12:26:58-04:00	ENVIRONMENT	HighCO2Level	Pump House 1	🔍 + ✓
2017-05-17T12:26:58-04:00	ENVIRONMENT	HighCO2Level	Pump House 1	🔍 + ✓
2017-06-02T12:26:58-04:00	WORKER	PanicButtonHazard	Dave Bethune	🔍 + ✓
2017-05-30T12:26:58-04:00	ENVIRONMENT	HighCO2Level	Pump House 1	🔍 + ✓
2017-04-26T23:40:52-04:00	WEARABLES	PanicButtonHazard	Zana Plotrowski	🔍 + ✓
2017-05-04T05:08:13-04:00	WEARABLES	FatigueHazard		🔍 + ✓
2017-04-26T23:40:52-04:00	WEARABLES	PanicButtonHazard		🔍 + ✓
2017-05-04T09:45:52-04:00	WEARABLES	FatigueHazard	Luis Jelley	🔍 + ✓
2017-05-04T07:50:09-04:00	WEARABLES	FatigueHazard	Luis Jelley	🔍 + ✓
	WEARABLES	FatigueHazard	Luis Jelley	🔍 + ✓
	WEARABLES	FatigueHazard	Luis Jelley	🔍 + ✓
2017-05-08T08:54:17-04:00	WEARABLES	FatigueHazard	Luis Jelley	🔍 + ✓
2017-05-30T12:26:58-04:00	WORKER	PanicButtonHazard	Pump House 1	🔍 + ✓
2017-06-06T12:26:58-04:00	WORKER	PanicButtonHazard	Dave Bethune	🔍 + ✓

Alerts can be from wearables, IoT sensors or Maximo

Drive actions direct from the alert

Operational Safety Work Centers – Alerts

Support Integration with Safety External Systems



IBM Watson IoT 4i Worker Safety



- Cloud SaaS Offering*
- Wearables status dashboard
- Threshold configuration to send alerts
- Potential integration with Maximo HSE Manager



Gas Exposure



Skin temp



Temp, Humidity

IBM Watson IoT 4i Worker Safety



Factory LTD. Overview Heat Map Trends Updated: 5/4/16 10:23:34 am Ari Volkoff

TEAMS

> Safety

Operations ●

- Tara Carson
- Hank Adams
- Mark Calms
- Bob Caldone
- Julie Daniels
- Ganesh Venka
- Warren Gates
- Toni Himes

> Maintenance ●

OVERVIEW | Team: Operations

74°F Partly Cloudy

3 Moderate Risk Heat stress Proximity 1 Technical problem Device disconnected Show details

8 Employees Risk Level

Tara Carson Connected Details

Heat stress Overexertion Proximity Gas

Hank Adams Connected Details

Heat stress Overexertion Proximity Gas

Mark Calms Connected Details

Heat stress Overexertion Proximity Gas

Ganesh Venka Disconnected Details

Heat stress Overexertion Proximity Gas

Warren Gates Connected Details

Heat stress Overexertion Proximity Gas

Toni Himes Connected Details

Heat stress Overexertion Proximity Gas

Julie Daniels Connected Details

Heat stress Overexertion Proximity

Bob Caldone Connected Details

Heat stress Overexertion Proximity

Hank Adams Technician 202-955-0192 Contact

High Risk

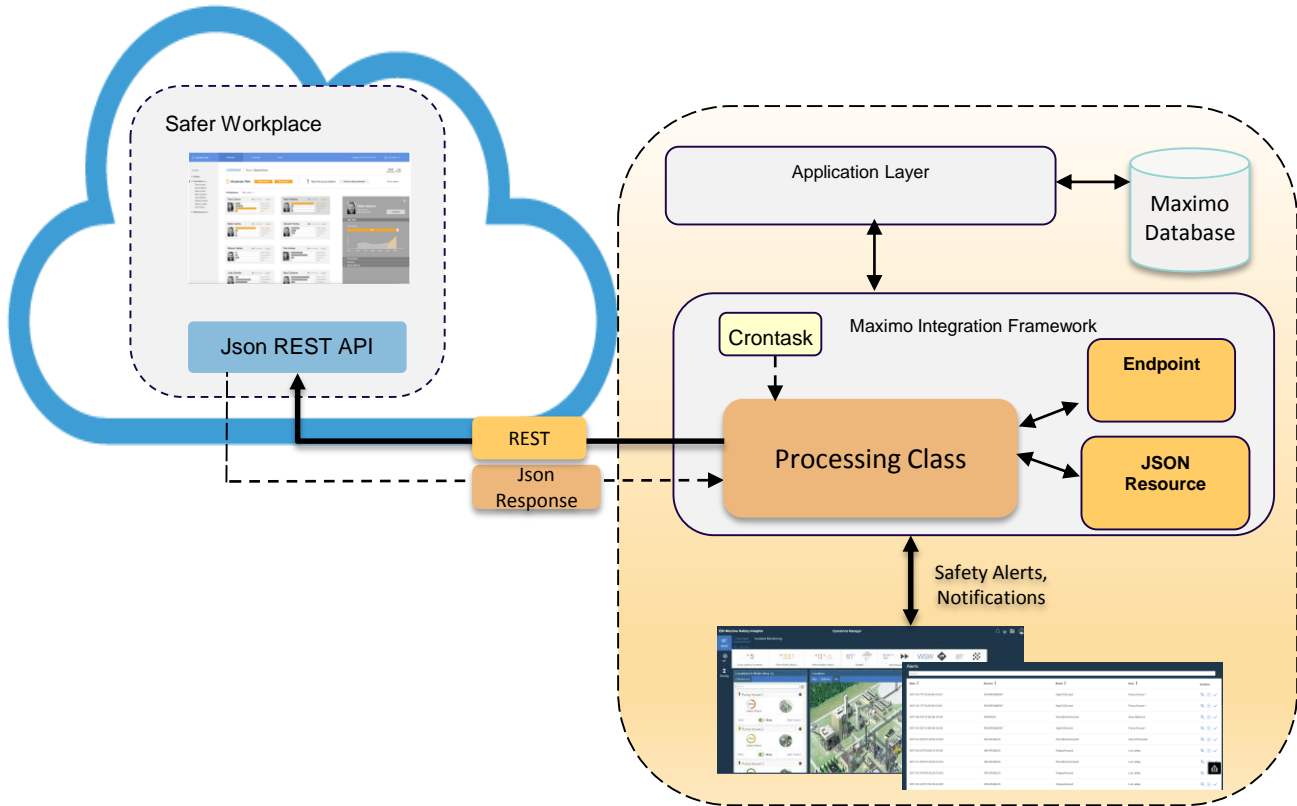
Heat stress

92

Time 8:00 8:10 8:20 8:30 8:40 8:50

Parameters Devices Alerts History

Maximo – Safer Workplace Integration Architecture



Overview screen with action options shown



IBM Maximo Safety Insights Operations Manager

Days without Incidents: 10 | Plant Safety Status: 33 | Office Safety Status: 100 | TAMP: 81 | Wind Speed: 12 | Direction: WSW | Humidity: 81

Locations in Boiler Area (3)

Collection List

Search

- Pump House 1** (Safety Status: 50%)
Work: Show Take Actions
- Pump House 2** (Safety Status: 50%)
Work: Show Take Actions
- Pump House 3** (Safety Status: 100%)
Work: Show Take Actions

Location: PUMPHOUSE1

Map Drill

- Create Service Request >
- Create Work Order >
- Go to Locations (HSE) >
- Go to Locations >
- Go to Preventive Maintenance >
- Go to Investigations (HSE) >
- Go to Assets >
- Go to Work Order Tracking >
- Go to Preventive Maintenance (HSE) >
- Go to Work Order Tracking (HSE) >
- Go to Condition Monitoring >
- Go to Assets (HSE) >

Close

Worker Safety (6)

- Dave Bethune (Safety Status: 88%)
- Frank Jones (Safety Status: 100%)
- Hank Adams (Safety Status: 100%)

Alerts

IBM Internet of Things 18

Overview screen with Work View shown for a Location



IBM Maximo Safety Insights

Operations Manager

Days without Incidents: 10 | Plant Safety Status: 33 | Office Safety Status: 100 | TAMPA: 81 | Wind Speed: 12 | Direction: WSW | Humidity: 81

Locations in Boiler Area (3)

Collection List

Search

Pump House 1
Safety Status: 50%
Work: [Toggle] Show Take Actions

Pump House 2
Safety Status: 50%
Work: [Toggle] Show Take Actions

Pump House 3
Safety Status: 100%
Work: [Toggle] Show Take Actions

Location

Map

Work View for PUMPHOUSE1

Work Order (2) Incident (1)

Search

1202 →
Pump house failure
Reported By: Mike Wilson Reported Date: 12 days ago
Status: Waiting on Approval

1201 →
Pump house failure
Reported By: Mike Wilson Reported Date: 12 days ago
Status: Waiting on Approval

Close

Worker Safety (6)

Search

Dave Bethune
Safety Status: 88%

Frank Jones
Safety Status: 100%

Hank Adams
Safety Status: 100%

Show parameters linked to location. For example work order with a safety critical element failure

Overview screen showing a notification



Notification present

IBM Maximo Safety Insights Operations Manager

Overview Incident Monitoring

Health

IoT

Scoring

Days without Incidents → 17

Plant Safety Status → 33 %

Office Safety Status → 100 %

Dismiss All

Safe Alert [56789] created.
Wed Jun 14 2017

Locations in Boiler Area (3)

Collection List

Pump House 1
Safety Status: 50%

Pump House 2
Safety Status: 50%

Pump House 3
Safety Status: 100%

Location
Map Drilldown Site

Dave Bethune
Safety Status: 86%

Frank Jones
Safety Status: 100%

Hank Adams
Safety Status: 100%

Detail of notification. Notification of an event can go to a persons dashboard or mobile device

Overview screen showing worker contact details



IBM Maximo Safety Insights Operations Manager

Overview

→ 16 Days without Incidents | → 33% Plant Safety Status | → 100% Office Safety Status

81°F TAMPA | 12MPH Wind Speed | WSW Direction | 81% Humidity

Locations in Boiler Area (3)

- Pump House 1: 50% Safety Status
- Pump House 2: 50% Safety Status
- Pump House 3: 100% Safety Status

Location: Map | Drilldown | Site

Worker Safety (6)

Dave Bethune: 88% Safety Status

Contact details for Dave Bethune:

- Site: Bedford MA Site of EAGLE Inc. North America
- Craft: Not Entered
- Skill Level: Not Entered
- Calendar: Day Shift Calendar
- Shift: Day Shift 0700-1500

Alerts

Date	Source	Event	User	Actions
2017-05-17T12:26:58-04:00	ENVIRONMENT	HighCO2Level	Pump House 1	

Dropdown shows contact details for worker

Incident Monitoring screen



Overview Incident Monitoring

Incidents in Boiler Area

Add Cards

1

+

Incidents in Boiler Area (1)

Collection List

Search

1179

High CO2 level

Location: Pump House 1

Asset: PUMP,VERTICAL TURBINE, HS 1 VERTICAL TURBINE PUMP

Status: NEW

Detail

Take Actions

This screen focuses specifically on incidents

Location

Map Drilldown Site



Health Summary

Asset Location

Automatic creation of an incident in Maximo from Worker Safety



Incidents (HSE) Mike Wilson

Find Incident

List View Incident Sequence of Events Activities Related Records Solution Details Log Failure Reporting Specifications Service Address High Context Map

Incident: 1099 Owner: Owner Group: Incident Type: INJURY Incident Category: HIGH POTEN Safety Observation Type: Status: NEW Attachments

Address Information

User Information

Reported By:	Affected Person:	Reported To:
<input type="text"/>	MULEMP	<input type="text"/>
Name:	Name:	Name:
<input type="text"/>	Zana Piotrowski	<input type="text"/>
Phone:	Phone:	Phone:
<input type="text"/>	<input type="text"/>	<input type="text"/>
E-mail:	E-mail:	E-mail:
<input type="text"/>	<input type="text"/>	<input type="text"/>

Incident Details

Summary:	Reportable?	Classification:
Panic ButtonHazard	<input type="checkbox"/>	<input type="text"/>
Details:		Class Description:
<input type="text"/>		<input type="text"/>
Reported Priority:		Internal Priority:
<input type="text"/>		<input type="text"/>
Service Group:		Service:
<input type="text"/>		<input type="text"/>
Vendor:		Site:
<input type="text"/>		<input type="text"/>
Is Defect?		
<input type="checkbox"/>		

Incident summary populated from wearable generated event

Location Detail



← Location Detail for PUMPHOUSE1

Links to local weather and meter readings

Location He... Weather Meter Reading



Location Health: **POOR**
Method: **OPEN WO**
Scoring Status: **Success**
Update Date: 6/1/17 2:06 PM
[Refresh Score](#)
[Scoring System](#)



Pump House 1
Status: **Operating**
Site: **BEDFORD**
TAMPA FL 33510
Hillsborough County

Drivers for OPEN WO (1)

CountWO
Weight 100%
Use Factors? N

Location detail with scoring basis

Time Period
Month (Default)

Health and Driver History



Scoring Methods



Scoring Methods

+ Create Method

Method Name	Normalization Formula	Applies To	Active
OPEN WO	$health/100*(100.0-0.0)+0.0$	Location	<input checked="" type="checkbox"/>

Back

Meter	Description	Meter Type	Unit of Measure
<input type="checkbox"/>	BAD TIE	CHARACTERISTIC	
<input type="checkbox"/>	BEARINGS	CHARACTERISTIC	
<input type="checkbox"/>	BLOCKS	CHARACTERISTIC	
<input type="checkbox"/>	BREAKER	CHARACTERISTIC	
<input type="checkbox"/>	CARBON	CHARACTERISTIC	
<input type="checkbox"/>	COMPONENTS	CHARACTERISTIC	
<input type="checkbox"/>	CORROSION	CHARACTERISTIC	
<input type="checkbox"/>	COUPLINGS	CHARACTERISTIC	
<input type="checkbox"/>	DRIVE	CHARACTERISTIC	
<input type="checkbox"/>	FLTHRS	CONTINUOUS	HOURS
<input type="checkbox"/>	FUEL-G	CONTINUOUS	GALS
<input type="checkbox"/>	FUEL-L	CONTINUOUS	LTRS
<input type="checkbox"/>	GAUGES	CHARACTERISTIC	
<input type="checkbox"/>	GUARD RAIL	CHARACTERISTIC	
<input type="checkbox"/>	GUARDS	CHARACTERISTIC	
<input type="checkbox"/>	HEAD LOSS1	CHARACTERISTIC	
<input type="checkbox"/>	HEAD LOSS2	CHARACTERISTIC	
<input type="checkbox"/>	HEAT	CHARACTERISTIC	
<input type="checkbox"/>	IN-PRESSUR	GAUGE	PSI

This screen shows a typical scoring method. This simple example for work orders with safety critical failures would be extended with further safety related methods



Scoring

Configure Integration screen for IoT connectivity



IBM Maximo Safety Insights Operations Manager

Health IoT Scoring

IBM Watson IoT Platform Associate Devices Analytics

Configure Integration

Connect to Watson IoT Platform (Step 1 of 4)

To access and analyze IoT data, connect to an IBM Watson IoT Platform organization.

Description
TemperatureReading

Bluemix Organization Details

IoT Organization
1av36m

[Open this organization on Bluemix](#)

If this link is broken, the organization ID is invalid or was not specified. [Learn more about finding the organization ID in IBM Bluemix](#).

IoT Connection

You create the API key and authentication token for this connection in Watson IoT Platform. [Learn more about creating the API key and authentication token](#).

API Key
a-1av36m-ct2vhu9rd

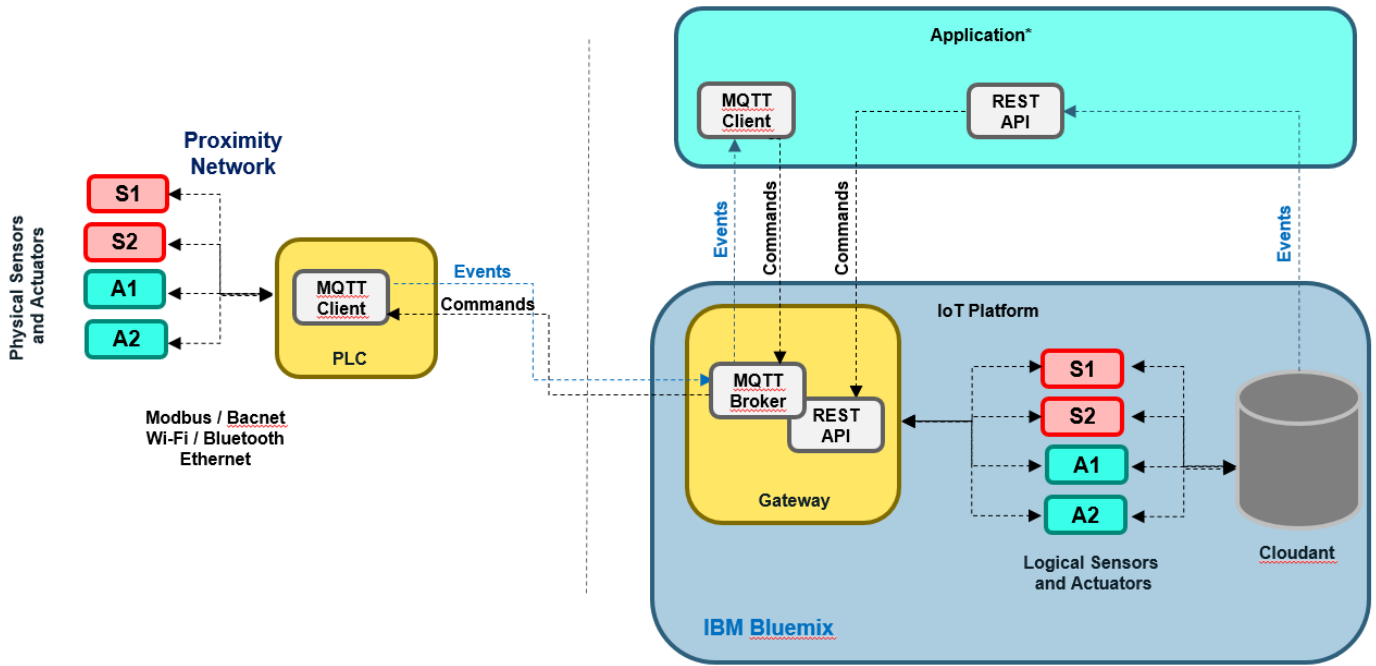
Authentication Token

Test Connection

Do you want to delete this configuration? [Yes, delete.](#)

Next >

IoT Platform Integration – Getting meter readings



Associate Devices screen



IBM Maximo Safety Insights Operations Manager

IBM Watson IoT Platform Associate Devices Analytics

Health Assets Locations

Associate Assets Manage Assets

IoT Search

Scoreing Save Refresh Undo Undo State

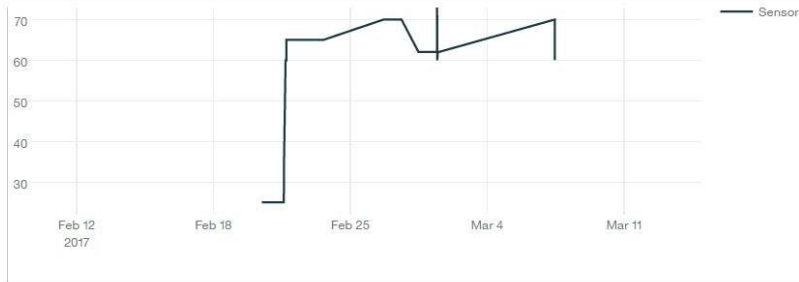
Asset	Meter	Device Type	Device ID	Description	Type
11430	RUNHOURS			Centrifugal Pump 100GPM/60FT HD	
11430	O-PRESSUR			Centrifugal Pump 100GPM/60FT HD	
11450	O-PRESSUR			Centrifugal Pump 100GPM/60FTHD	
11450	RUNHOURS			Centrifugal Pump 100GPM/60FTHD	
11470	RUNHOURS			Centrifugal Pump 100 GPM, 60 FT-HD	
11480	RUNHOURS			Centrifugal Pump 100 GPM, 60 FT-HD	
12500	RUNHOURS			Overhead Crane #2	
12500	FUEL-G			Overhead Crane #2	
AH006	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 2 20-HP	PUMP
AH006	VIBRATIONH			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 2 20-HP	PUMP
AH006	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 2 20-HP	PUMP
AH007	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 3 20-HP	PUMP
AH007	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 3 20-HP	PUMP
AH007	VIBRATIONH			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 3 20-HP	PUMP
AH008	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 4 20-HP	PUMP
AH008	VIBRATIONH			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 4 20-HP	PUMP
AH008	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 4 20-HP	PUMP
AH009	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 5 30-HP	PUMP
AH009	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 5 30-HP	PUMP
AH009	VIBRATIONH			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 5 30-HP	PUMP
AH010	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 6 30-HP	PUMP
AH010	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 6 30-HP	PUMP
AH010	VIBRATIONH			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 6 30-HP	PUMP
AH011	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 7 30-HP	PUMP
AH011	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 7 30-HP	PUMP
AH011	VIBRATIONH			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 7 30-HP	PUMP
AH012	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 8 30-HP	PUMP
AH012	VIBRATIONH			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 8 30-HP	PUMP
AH012	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 8 30-HP	PUMP
AH013	RUNHOURS			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 9 30-HP	PUMP
AH013	TEMP-F			PUMP.SUBMERSIBLE, SUBMERSIBLE PUMP # 9 30-HP	PUMP

Associate Devices with Maximo Meters

Detail view showing events associated with a safety critical element. In this example an isolation valve



Location Detail for PUMPHOUSE1



Valve status (Characteristic meter)

Date ▾	Type ▾	Description ▾
2017-02-28 12:26:39	PASSING	Passing at closed position
2017-02-28 12:36:05	CALIBRATION_OK	Passing at closed position





Next Steps

- Development of work centers next release
- Extension to other personas
- Accelerate for integration between HSE Manager and Safer Workplace



Thank you!