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UC2010

Real Time Information — Currency of the New Decade

Hilton Anchorage | Anchorage, AK

September 16, 2010

Achieving Reliability-Centered Maintenance and Diagnostics with the PI System

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Casne Engineering, Inc.



PRESENTATION OVERVIEW

- Introductions
- Background: Mission, Goals and Challenges
- Maintenance Strategies & RCM
- Maintenance Diagnostics and Resource Center
- System Architecture
- The Results
- Next Steps

ABOUT CASNE ENGINEERING

- Specialties:
 - ❖ Electrical Engineering & Energy Management
 - ❖ Process Control Design & Integration
 - ❖ Software Development & Integration
- Over 30 years of professional service
- Employee-owned company
- Distributed workforce with international reach
- 50+ years of combined OSIsoft product experience



ABOUT ALYESKA PIPELINE



- 800 miles long
- 48" diameter pipe
- 5 Pump Stations
- Marine Terminal
- 1.4 Million bpd operating capacity
- Logistics & Operations centers in Valdez, Anchorage, and Fairbanks



Operation Control Center

Background

- Mission
 - Ensure pipeline reliability and integrity using advanced maintenance strategies
- Goals
 - Proactive vs. reactive maintenance
 - Optimize available resources
 - Discover new & better ways to operate
- Challenges
 - Difficult operating environment
 - Complexities of modernization
 - Attrition of SME's
 - Pressure to reduce operating costs
 - Increasing scrutiny and regulation



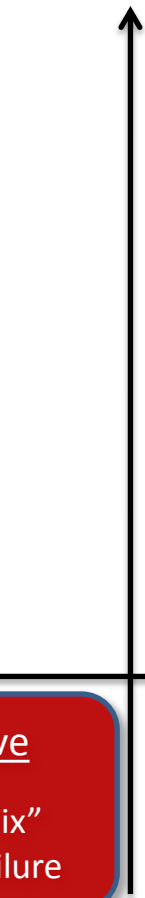
RCM – What is it?

Reliability-Centered Maintenance is a process used to determine what must be done to ensure that any physical asset continues to do what its users expect in its present operating context. ~Moubray, RCM II (1992)

- ✓ Describe functions, failure modes, causes, effects and consequences
- ✓ Measure Performance, Actuarial Analysis, Failure Data
- ✓ Determine appropriate preventative & predictive tasks for each physical asset

Evolution of Maintenance Strategies

Effectiveness



Preventative

Calendar-based
Runtime-based

Condition-based

Non-Continuous

- Manual and/or Instrumented Readings
- Manual Analysis

Continuous

- Instrumented Readings
- Automated Analysis

Predictive

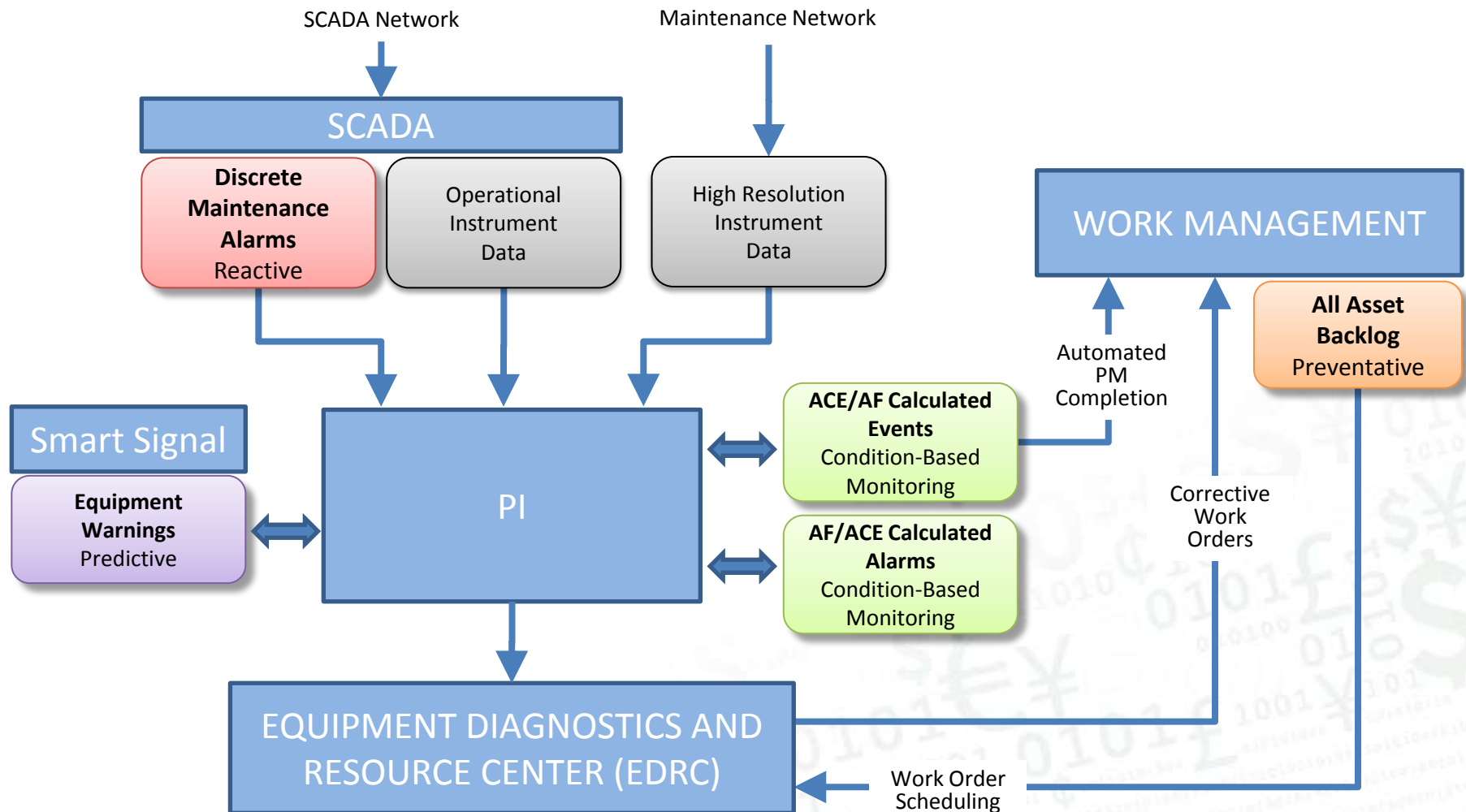
Model-Based
Learning Systems

Reactive

“Break-Fix”
Run-to-failure

Efficiency

Maintenance Strategies in Action



Continuous Monitoring proof of concept RGV Valves



Operations, Engineering & Maintenance (OEM) > Maintenance & Diagnostics Center

Welcome Hammond, Darryl G. | My Site | My Links |

Maintenance & Diagnostics Center

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Oil Movements Department

- Analytical Lab Services
- Measurements
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- Scheduling

Recycle Bin

Announcements

There are currently no active announcements. To add a new announcement, click "Add new announcement" below.

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Equipment Hierarchy

D&R Viewer

Alarm Viewer

Event Viewer

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CCC

SCADA/ICS

Scheduling

Maintenance & Diagnostics Center > XAPLibrary > eventtrends

Search Criteria

Start Date: 8/13/2010 Start Time: 12:00 AM
End Date: 8/13/2010 End Time: 9:23 AM
Year To Date

MTL Tag:

Maintenance Event ID:

Pass/Review Show All

Priority Show All

System Show All

Facility Show All

Network Show All

Queried Events

Maintenance Event ID	BQ Tag	Event Time	Event Description
EV100403140023	20-RGV-100	4/2/2010 2:00:23 PM	RGV 30% St
EV100526211205	20-RGV-100	5/26/2010 9:22:05 PM	RGV 100% St
EV100820083708	20-RGV-100	8/20/2010 8:37:08 AM	RGV 30% St
EV090923154405	20-RGV-101	9/23/2009 3:44:05 PM	RGV 30% St
EV100403140617	20-RGV-101	4/2/2010 2:06:17 PM	RGV 30% St
EV100526211238	20-RGV-101	5/26/2010 9:21:38 PM	RGV 100% Str
EV100820084837	20-RGV-101	8/20/2010 8:48:37 AM	RGV 30% Str
EV100403141208	20-RGV-102	4/2/2010 2:12:08 PM	RGV 30% St
EV100526211230	20-RGV-102	5/26/2010 9:22:30 PM	RGV 100% St
EV100820085551	20-RGV-102	8/20/2010 8:55:51 AM	RGV 30% St
EV100403141827	20-RGV-103	4/2/2010 2:18:27 PM	RGV 30% St
EV100526211204	20-RGV-103	5/26/2010 9:22:04 PM	RGV 100% St
EV100820090400	20-RGV-103	8/20/2010 9:04:00 AM	RGV 30% St
EV100403142453	20-RGV-104	4/2/2010 2:24:53 PM	RGV 30% St
EV100526211243	20-RGV-104	5/26/2010 9:22:43 PM	RGV 100% St
EV100820091110	20-RGV-104	8/20/2010 9:11:10 AM	RGV 30% St
EV100403143058	20-RGV-105	4/2/2010 2:30:58 PM	RGV 30% St
EV100409151826	20-RGV-105	4/9/2010 3:18:26 PM	IN MAINT
EV100702095735	20-RGV-105	7/2/2010 9:57:35 AM	IN MAINT

CLOSE EVENT



REFRESH TRENDS

MAINTENANCE EVENT DETAIL

Equipment Tag: 20-RGV-118 Actuator Ratio: 548.73
Event Time: 08/24/09 16:03:15 Event ID: 1743
Description: PASS : Valve 30PCT STROKE
Stroke Amount: 30

Close Event

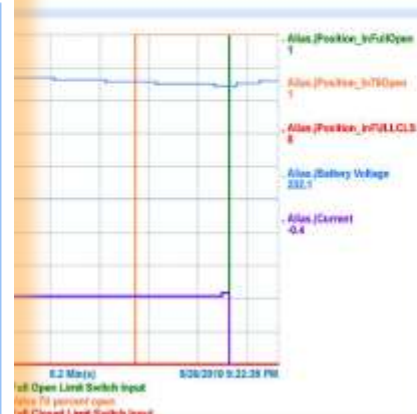
Close Time (Min) 121
Close Time (Max) 180
Close Time (Actual) 132.00
Close (Start) 08/24/09 15:58:37
Close (End) 08/24/09 16:00:49

Open Event

Open Time (Min) 121
Open Time (Max) 180
Open Time (Actual) 124.00
Open (Start) 08/24/09 16:01:11
Open (End) 08/24/09 16:03:15

Current (Peak) 10.60
Current (Average) 9.02
Voltage (Average) 235.17

Current (Peak) 10.60
Current (Average) 7.03
Voltage (Average) 231.49



Maintenance & Diagnostics Center

Maintenance & Diagnostics Center Equipment Hierarchy Maintenance Strategies Planning & Scheduling

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Network Show All

Reset Search Export

Queried

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EV100526212205	20-RGV-100
EV100820083708	20-RGV-100
EV090923154405	20-RGV-101
EV100403140617	20-RGV-101
EV100526212138	20-RGV-101
EV100820084837	20-RGV-101
EV100403141208	20-RGV-100
EV100526212230	20-RGV-100
EV100820085551	20-RGV-100
EV100403141827	20-RGV-100
EV100526212204	20-RGV-101
EV100820090400	20-RGV-100
EV100403142453	20-RGV-104
EV100526212243	20-RGV-104
EV100820091110	20-RGV-104
EV100403143058	20-RGV-100
EV100409151826	20-RGV-100
EV100702095735	20-RGV-100

Alarm History: *-30d

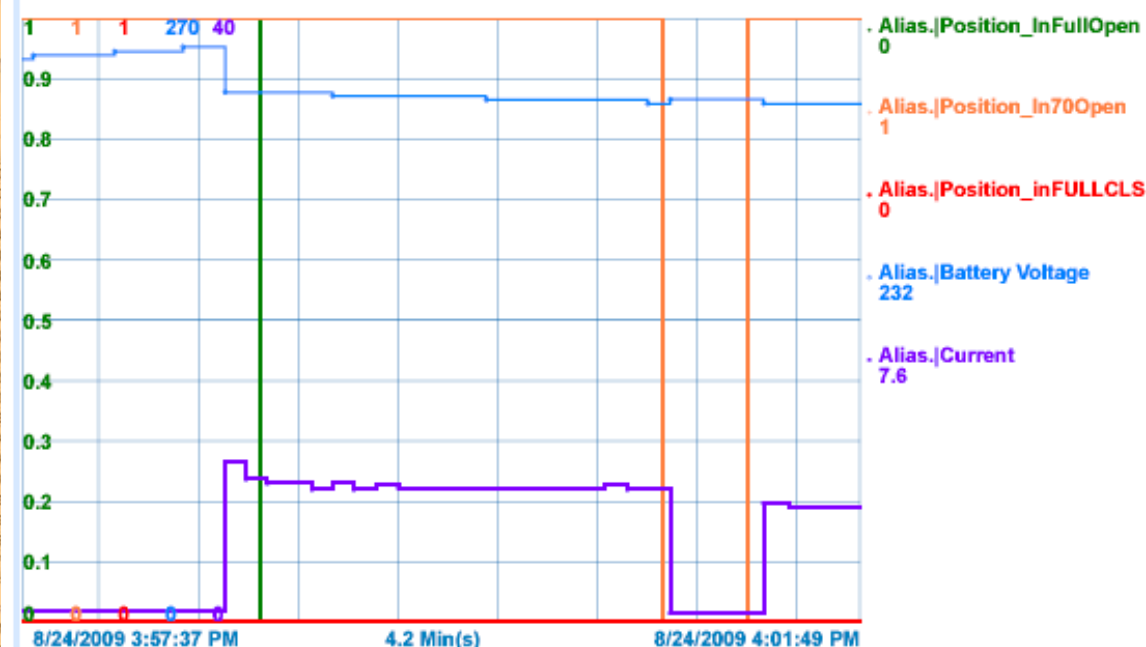
Equipment Tag: 20-RGV-101 Actuator Ratio: 548.73
Event Time: 5/25/2010 9:21:38 PM Event ID: EV100
Description: Travel Time Review : Valve FULL STROKE Valve closing time is 36 percentage (20%) of the target time 480

Close Event

Close Time (Min)	384	Open Time (Min)	
Close Time (Max)	576	Open Time (Max)	
Close Time (Actual)	360	Open Time (Actual)	372
Close (Start)	5/25/2010 6:40:23 PM	Open (Start)	5/26/2010 9:15:26 PM
Close (End)	5/25/2010 6:46:23 PM	Open (End)	5/26/2010 9:21:38 PM
Current (Peak)	13.30	Current (Peak)	9.70
Current (Average)	8.36	Current (Average)	8.22
Voltage (Average)	232.21	Voltage (Average)	233.30

PRINT EVENT

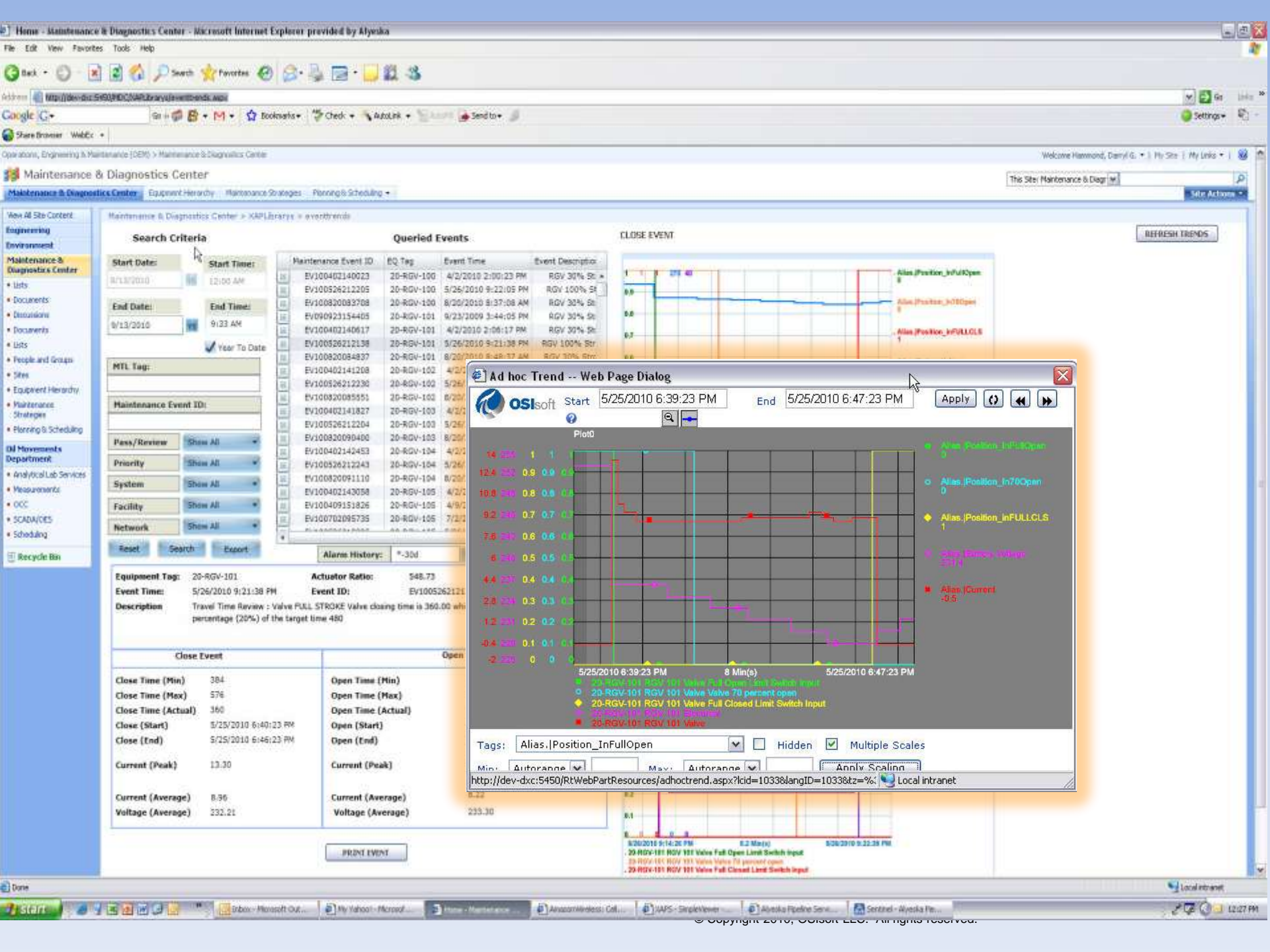
CLOSE EVENT



- 20-RGV-118 RGV 118 Valve Full Open Limit Switch Input
- 20-RGV-118 RGV 118 Valve Valve 70 percent open
- 20-RGV-118 RGV 118 Valve Full Closed Limit Switch Input
- 20-RGV-118 RGV 118 Electrical
- 20-RGV-118 RGV 118 Valve



- 20-RGV-181 RGV 181 Valve Full Open Limit Switch Input
- 20-RGV-181 RGV 181 Valve Valve 70 percent open
- 20-RGV-181 RGV 181 Valve Full Closed Limit Switch Input





Maintenance & Diagnostics Center

This Site: Maintenance & Diag

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☒ Year To Date

MTL Tag:

Maintenance Event ID:

Pass/Review Show All

Priority Show All

System Show All

Facility Show All

Network Show All

Reset Search Export

Equipment Tag: 20-RGV-101

Event Time: 5/26/2010 9:21:38 PM

Description: Travel Time Review : Valve PULL STROKE V

percentage (20%) of the target time 480

Actuator ID: Event ID:

Close Event

Close Time (Min) 384

Close Time (Max) 576

Close Time (Actual) 360

Close (Start) 5/25/2010 6:40:23 PM

Close (End) 5/25/2010 6:46:23 PM

Current (Peak) 13.30

Current (Average) 8.96

Voltage (Average) 232.21

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EV100403140023	20-RGV-100	4/2/2010 2:00:23 PM	RGV 30% St
EV100526212205	20-RGV-100	5/26/2010 9:22:05 PM	RGV 100% St
EV100820083708	20-RGV-100	8/20/2010 8:37:08 AM	RGV 30% St
EV090923154405	20-RGV-101	9/23/2009 3:44:05 PM	RGV 30% St
EV100403140617	20-RGV-101	4/2/2010 2:06:17 PM	RGV 30% St
EV100526212138	20-RGV-101	5/26/2010 9:21:38 PM	RGV 100% St
EV100820084437	20-RGV-101	8/20/2010 8:44:37 AM	RGV 30% St
EV100403140214	20-RGV-101	4/2/2010 2:02:14 PM	RGV 30% St
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EV100403140214	20-RGV-101	4/2/2010 2:02:14 PM	RGV 30% St
EV100526212138	20-RGV-101	5/26/2010 9:21:38 PM	RGV 100% St
EV100820083708	20-RGV-101	8/20/2010 8:37:08 AM	RGV 30% St
EV100403140214	20-RGV-101	4/2/2010 2:02:14 PM	RGV 30% St
EV100526212138	20-RGV-101	5/26/2010 9:21:38 PM	RGV 100% St
EV100820083708	20-RGV-101	8/20/2010 8:37:08 AM	RGV 30% St
EV100403140214	20-RGV-101	4/2/2010 2:02:14 PM	RGV 30% St
EV100526212138	20-RGV-101	5/26/2010 9:21:38 PM	RGV 100% St
EV100820083708	20-RGV-101	8/20/2010 8:37:08 AM	RGV 30% St
EV100403140214	20-RGV-101	4/2/2010 2:02:14 PM	RGV 30% St
EV100526212138	20-RGV-101	5/26/2010 9:21:38 PM	RGV 100% St
EV100820083708	20-RGV-101	8/20/2010 8:37:08 AM	RGV 30% St
EV100403140214	20-RGV-101	4/2/2010 2:02:14 PM	RGV 30% St
EV100526212138	20-RGV-101	5/26/2010 9:21:38 PM	RGV 100% St
EV100820083708	20-RGV-101	8/20/2010 8:37:08 AM	RGV 30% St

Operations, Engineering & Maintenance (OEM) > Maintenance & Diagnostics Center

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Maintenance & Diagnostics Center

This Site: Maintenance & Diagn...

Maintenance & Diagnostics Center | Equipment Hierarchy | Maintenance Strategies | Planning & Scheduling | **Site Actions**

View All Site Content

Engineering

Environment

Maintenance & Diagnostics Center

- Documents
- Discussions
- Documents
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- People and Groups
- Sites
- Equipment Hierarchy
- Maintenance Strategies
- Planning & Scheduling

Oil Movements Department

- Analytical Lab Services
- Measurements
- OCC
- SCADA/OES
- Scheduling

Recycle Bin

Announcements

There are currently no active announcements. To add a new announcement, click "Add new announcement" below.

☐ Add new announcement

Equipment Hierarchy

D&R Viewer

Alarm Viewer

Event Viewer

All Asset Backlog

Work Management

Excel Web Access - AllAssetTemplate

Open Update Find											
	A	B	C	D	E	F	G	H	I	J	K
	Ace_Calc	Event_ID	ACE_Event_Date	To Schedule	Score	Task Status	Ops Sys	Tag #	Work Group	Crew Code	
1											
2					322	READY		OASIS #6905~AIR QUALITY SUPP			
3					172	READY	INVC	0000005915-0	INVCT	INV	
4					-487	READY	GMB	34-SYS-ELEC	PS#04	34M	
5					476	READY	FMB	39-BD-4701R	PMC	39CS	
6					451	READY	FMB	39-BD-2	PMC	39CS	
7					286	READY	INVC	R&R ENDUSER EG	INVCT	INV	
8					478	READY	FMB	20-RGV-119-BD	LWMT	LWMT	
9					322	READY		SLR #6956~2007 FISH & WILDLIFE			
10					390	READY		34-SYS-CIVIL	PL PROJ		
11					271	READY	FMB	39-SYS-ELEC	LWMT	LWMT	2
12					390	READY		34-SYS-EQUIP	PL PROJ	VHF	
13					431	READY	P-ENI	39-UCP-4201R	PS#09	OPS	
14					451	READY	FMB	38-BD-33	LWMT	LWMT	2
15					356	READY	FMB	39-BD-77	LWMT	LWMT	
16					365	RETURN	FMB	31-MOV-120S	LWMT	LWMT	
17					371	READY	FMB	20-RGV-31-BD	LWMT	LWMT	
18					371	READY	FMB	20-RGV-26-BD	LWMT	LWMT	
19					371	READY	FMB	20-RGV-34-BD	LWMT	LWMT	2
20					371	READY	FMB	20-RGV-32-BD	LWMT	LWMT	

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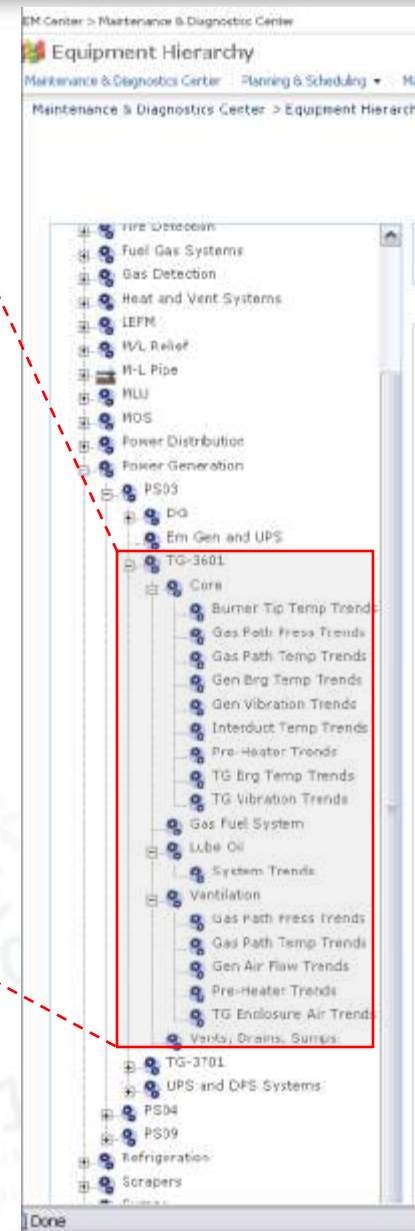
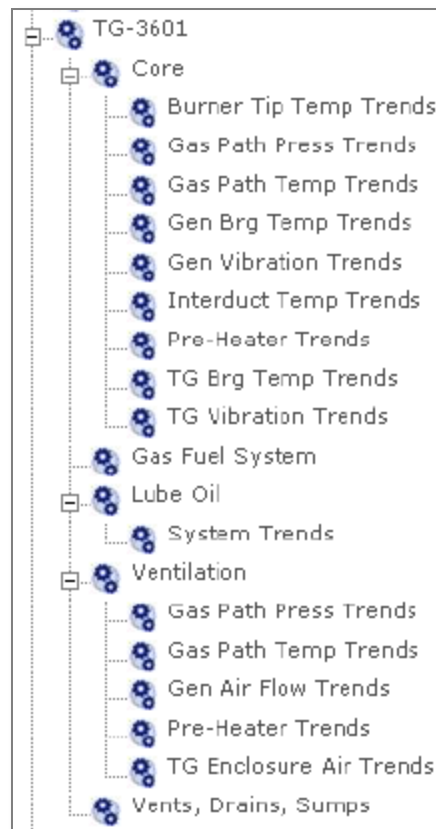
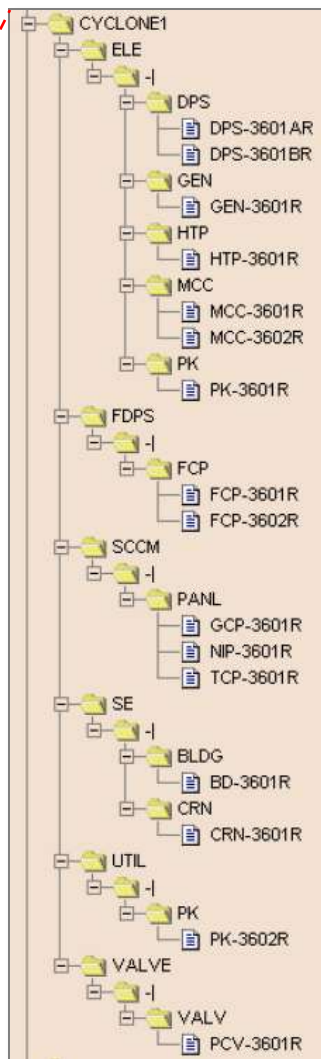
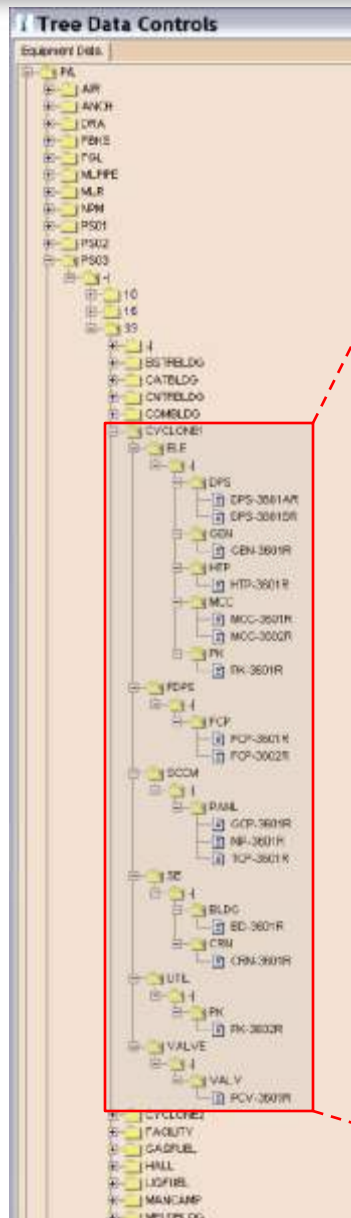
Recycle Bin

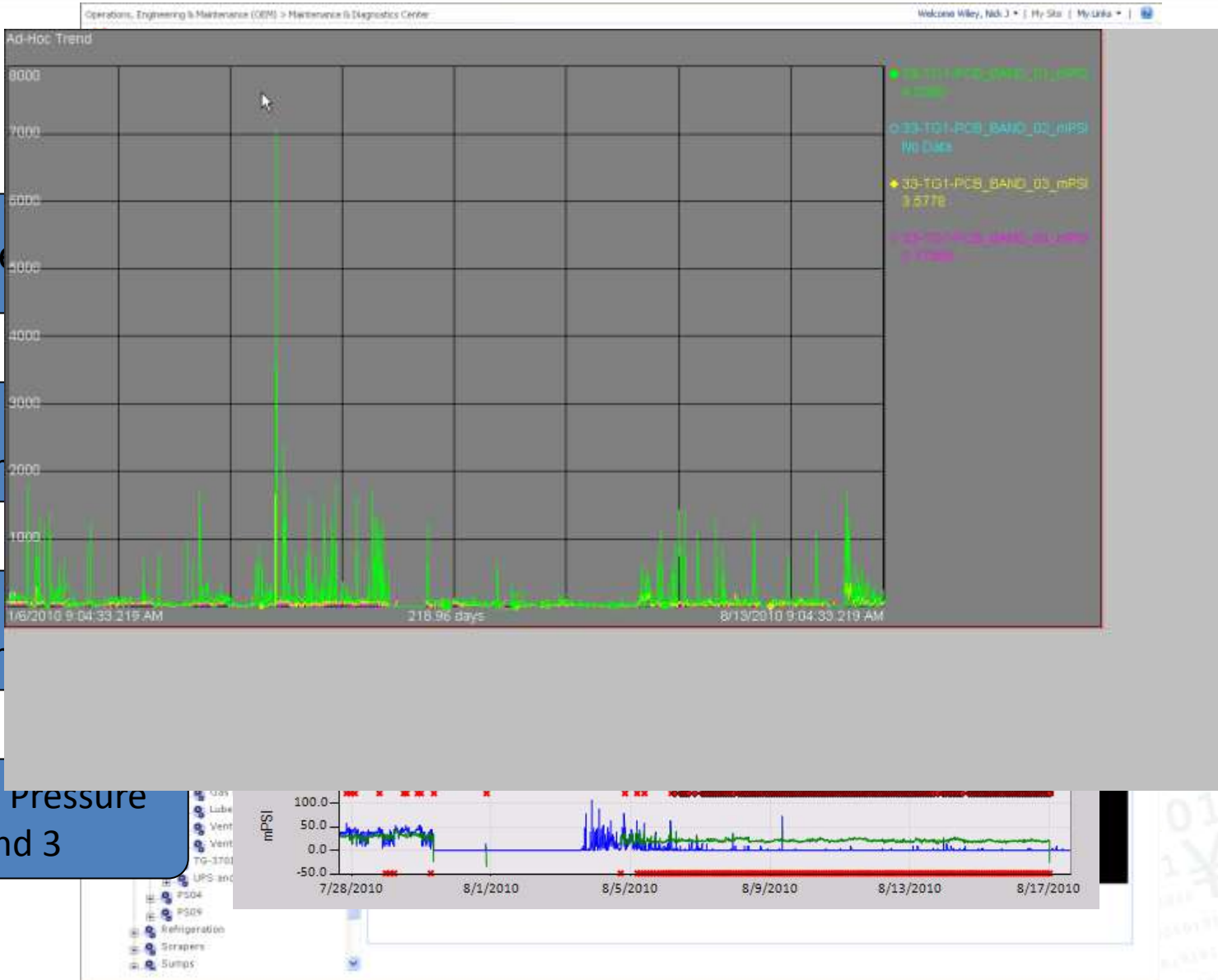
Announcements

There are currently no active announcements. To add a new announcement, click "Add new announcement" below.

☐ Add new announcement

```
graph TD; EH[Equipment Hierarchy] --- D&R[D&R Viewer]; EH --- AV[Alarm Viewer]; EH --- EV[Event Viewer]; EH --- AAB[All Asset Backlog]; D&R --- AV; AV --- EV; AV --- AAB; EV --- AAB;
```



Going beyond the usual sensors...

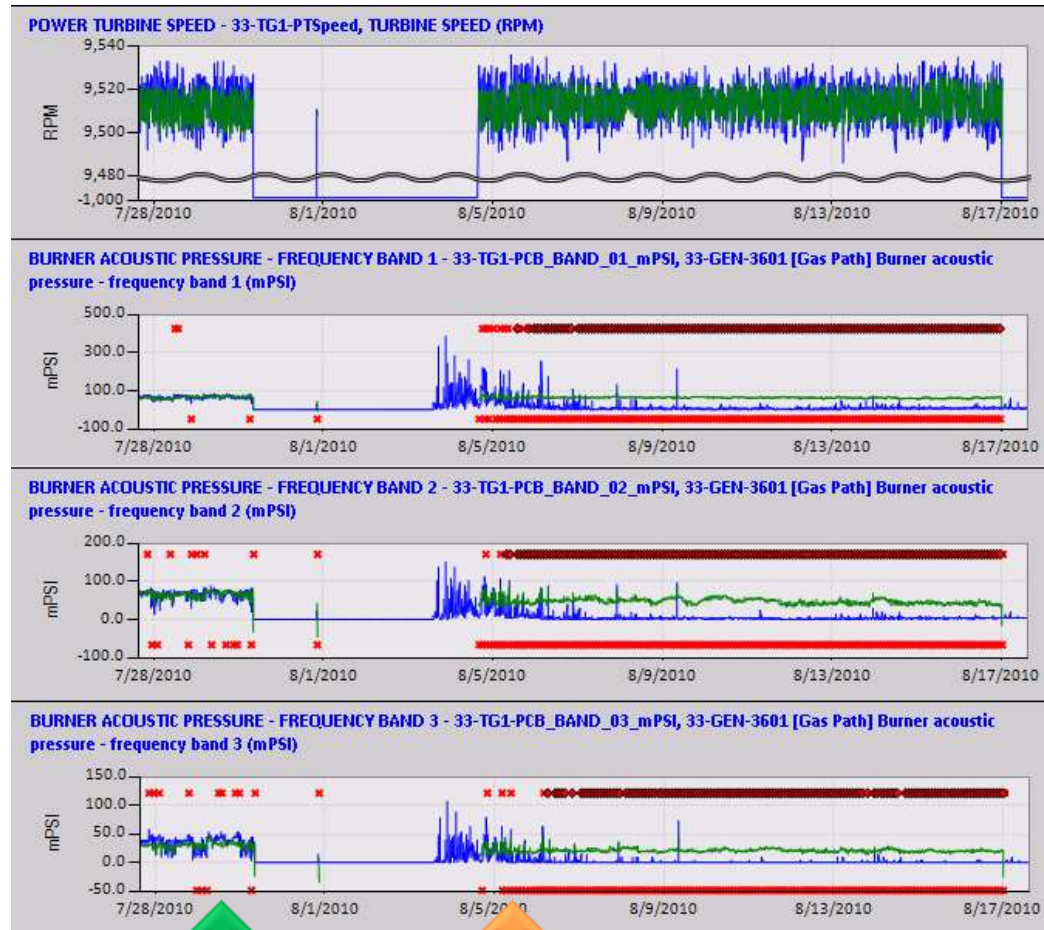
burner acoustic pressures – gas turbine generator

Speed

Acoustic Pressure
Band 1

Acoustic Pressure
Band 2

Acoustic Pressure
Band 3



Tracking the Model

Significant change after re-start

Operations, Engineering & Maintenance (OEM) > Maintenance & Diagnostics Center

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Maintenance & Diagnostics Center Equipment Hierarchy Maintenance Strategies Planning & Scheduling **Site Actions**

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Recycle Bin

Announcements

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☐ Add new announcement

```
graph TD; EH[Equipment Hierarchy] --- D&R[D&R Viewer]; EH --- Alarm[Alarm Viewer]; EH --- EV[Event Viewer]; D&R --- Alarm; D&R --- AB[All Asset Backlog]; Alarm --- EV; Alarm --- AB; EV --- AB;
```


Documentation and Rationalization

Maintenance Search

Alarm Tag:

PI Tag:

MEL Tag:

MTL Tag:

Network

P/L

Point Source

ALARMS

Facility

20-RGV-101

System

RGV

SubSystem

BUILDING

Component Type

HVAC

Class

Show All

Priority

Show All

Reset

Search

Export

Matching Tags

PS10_RGV_AUX-101R.almBldgTemp

Matching Tag Count: 1

D_N_R View

PI D_N_R View

Alarm Tag:

PS10_RGV_AUX-101R.almBldgTemp

Alarm Definition:

RGV-101 - Equipment Room Temperature Alarm [20-RGV-101]

PI Tag:

PS10_RGV_AUX-101R.almBldgTemp

PI Description:

RGV-101 - Equipment Room Temperature Alarm [20-RGV-101]

Point Source

ALARMS

MEL Tag

MTL Tag

20-RGV-101-BD

Cause Definition

Cat A site to cold:
1) Ormat heat loops not working
2) Winter/Summer low temp error

Effects Definition

RGV Building to Hot or Cold

Recommended Planning Actions

Recommended Maintenance Action

Priority

8

Repair Time:

Maintenance Event Response Time

>12Hrs

Notification Time

☒ DR Complete:

DR Complete Date

7/31/2007

DR Complete User

Export

Maintenance Search

Alarm Tag: PI Tag: MEL Tag: MTL Tag: Network P/LPoint Source ALARMSFacility 20-RGV-101System RGVSubSystem BUILDINGComponent Type HVACClass Show AllPriority Show All

Reset

Search

Export

Matching Tags

PS10_RGV_AUX-101R.almBldgTemp

Matching Tag Count: 1

D_N_R View

PI D_N_R View

Alarm Tag PS10_RGV_AUX-101R.almBldgTempAlarm Tag Description RGV-101 - Equipment Room Temperature Alarm [20-RGV-101]PI Tag Name PS10_RGV_AUX-101R.almBldgTempPI Tag Description RGV-101 - Equipment Room Temperature Alarm [20-RGV-101]Priority 8System RGVLocation 20-RGV-101MTL Tag 20-RGV-101-BDMEL Tag Tag Justification Tag Dependence General Comments ☒ Tag ActiveTag Type pttypDigitalUnit of Measure Point Source ALARMSAlarm Set Point DeadBand 0-28800Span 1Device Range Sample Rate Compression Set 1Exception User Group Display File Collection Start Collection End Creator piadminCreate Date 6/16/2009

Operations, Engineering & Maintenance (OEM) > Maintenance & Diagnostics Center

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☐ Add new announcement

Equipment Hierarchy

Alarm Viewer

Event Viewer

All Asset Backlog

X Viewer

Alarm Management

Shared Documents > Alarm Viewer - Windows Internet Explorer

http://dev-det3450/MDC/Shared%20Documents/Alarm%20Viewer.aspx

Operations, Engineering & Maintenance (OEM) > Maintenance & Diagnostics Center

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This Site: Maintenance & Diag

Site Actions

Maintenance & Diagnostics Center

Maintenance & Diagnostics Center | Equipment Hierarchy | Maintenance Strategies | Planning & Scheduling

Maintenance & Diagnostics Center > Shared Documents > Alarm Viewer

Alarm Viewer

Search Criteria

Time Filter: Start Date: 3/2/2010 Start Time: 12:00 AM End Date: 3/2/2010 End Time: 2:24 PM Auto Refresh

Tag Filter: Alarm Tag: PI Tag: MEL Tag: MTL Tag: Event ID: Description:

Area Filter: Location: Show All Point Source: Show All Facility: Show All System: Show All Subsystem: Show All Component Type: Show All Class: Show All

Acknowledge Alarm Block Alarm Submit Work Request Save State Export/Print View in EMIS Transf Schedule Report RTSP

	Event ID	Priority	Time Stamp	Alarm Tag	PI Tag	Description
	10030214135440854	8	3/2/2010 2:13:54 PM	PS09_MLU_1_POSH-LUBE_OIL_FIL_R.almProcess	PS09_MLU_1_POSH-LUBE_OIL_FIL_R.almProcess	PS-09 MLU-1 P
	10030214115440887	8	3/2/2010 2:11:54 PM	PS09_MLU_1_PMP-LUBE_OIL2_R.almUnCmdChg	PS09_MLU_1_PMP-LUBE_OIL2_R.almUnCmdChg	PS-09 MLU-1 L
	10030214002939904	8	3/2/2010 2:00:29 PM	PS07_RGV_COMM-69R.almCommA	PS07_RGV_COMM-69R.almCommA	RGV-069 Com
	10030214000039987	8	3/2/2010 2:00:00 PM	PS07_RGV_COMM-69AR.almCommA	PS07_RGV_COMM-69AR.almCommA	RGV-069A Com
	10030213551039890	8	3/2/2010 1:55:10 PM	PS07_RGV_COMM-68R.almCommA	PS07_RGV_COMM-68R.almCommA	RGV-068 Com
	10030212504635076	8	3/2/2010 12:50:46 PM	PS04_MLU_1_PMP-LUBE_OIL1_R.almUnCmdChg	PS04_MLU_1_PMP-LUBE_OIL1_R.almUnCmdChg	PS-04 MLU-1 L
	10030211560440879	8	3/2/2010 11:56:04 AM	PS09_MLU_1_PMP-LUBE_OIL1_R.almUnCmdChg	PS09_MLU_1_PMP-LUBE_OIL1_R.almUnCmdChg	PS-09 MLU-1 L
	10030211431441072	9	3/2/2010 11:43:14 AM	PS09_MLU_1_UCP-HEALTH_R.almPanelOpen	PS09_MLU_1_UCP-HEALTH_R.almPanelOpen	PS-09 MLU-1 U
	10030211255441848	8	3/2/2010 11:25:54 AM	PS09_MLU_3_PMP-LUBE_OIL1_R.almUnCmdChg	PS09_MLU_3_PMP-LUBE_OIL1_R.almUnCmdChg	PS-09 MLU-3 L
	10030211252341856	8	3/2/2010 11:25:23 AM	PS09_MLU_3_PMP-LUBE_OIL2_R.almUnCmdChg	PS09_MLU_3_PMP-LUBE_OIL2_R.almUnCmdChg	PS-09 MLU-3 L
	10030208264335498	9	3/2/2010 8:26:43 AM	PS04_MLU_2_HVAC-R.almHVACIDNET	PS04_MLU_2_HVAC-R.almHVACIDNET	PS-04 MLU-2 H
	10030208264331698	8	3/2/2010 8:26:43 AM	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS-03 MLU-1 N
	10030208264331700	8	3/2/2010 8:26:43 AM	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS-03 MLU-1 N
	10030208264346484	10	3/2/2010 8:26:43 AM	PS01_TVP-DISCH_ANALOGS.TrkBlinkGasOutOfRangeAim	PS01_TVP-DISCH_ANALOGS.TrkBlinkGasOutOfRangeAim	Tank Blanket G
	10030208264335010	8	3/2/2010 8:26:43 AM	PS04_MLU_1_HVAC-R.almCOMMON	PS04_MLU_1_HVAC-R.almCOMMON	PS-04 MLU-1 H
	10030208230840080	8	3/2/2010 8:23:08 AM	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU-1 L
	1003020623531668	7	3/2/2010 6:23:55 AM	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS-03 MLU-1 L

Time Filter

Start Date

2/28/2010

Start Time

12:00 AM

End Date

3/2/2010

End Time

11:28 AM

☒ Auto Refresh

Tag Filter

Alarm Tag:

PI Tag:

MEL Tag:

MTL Tag:

Event ID:

Description:

Area Filter

Location

Show All

Point Source

Show All

Facility

Show All

System

Show All

SubSystem

Show All

Component Type

Show All

Class

Show All

Priority

Show All

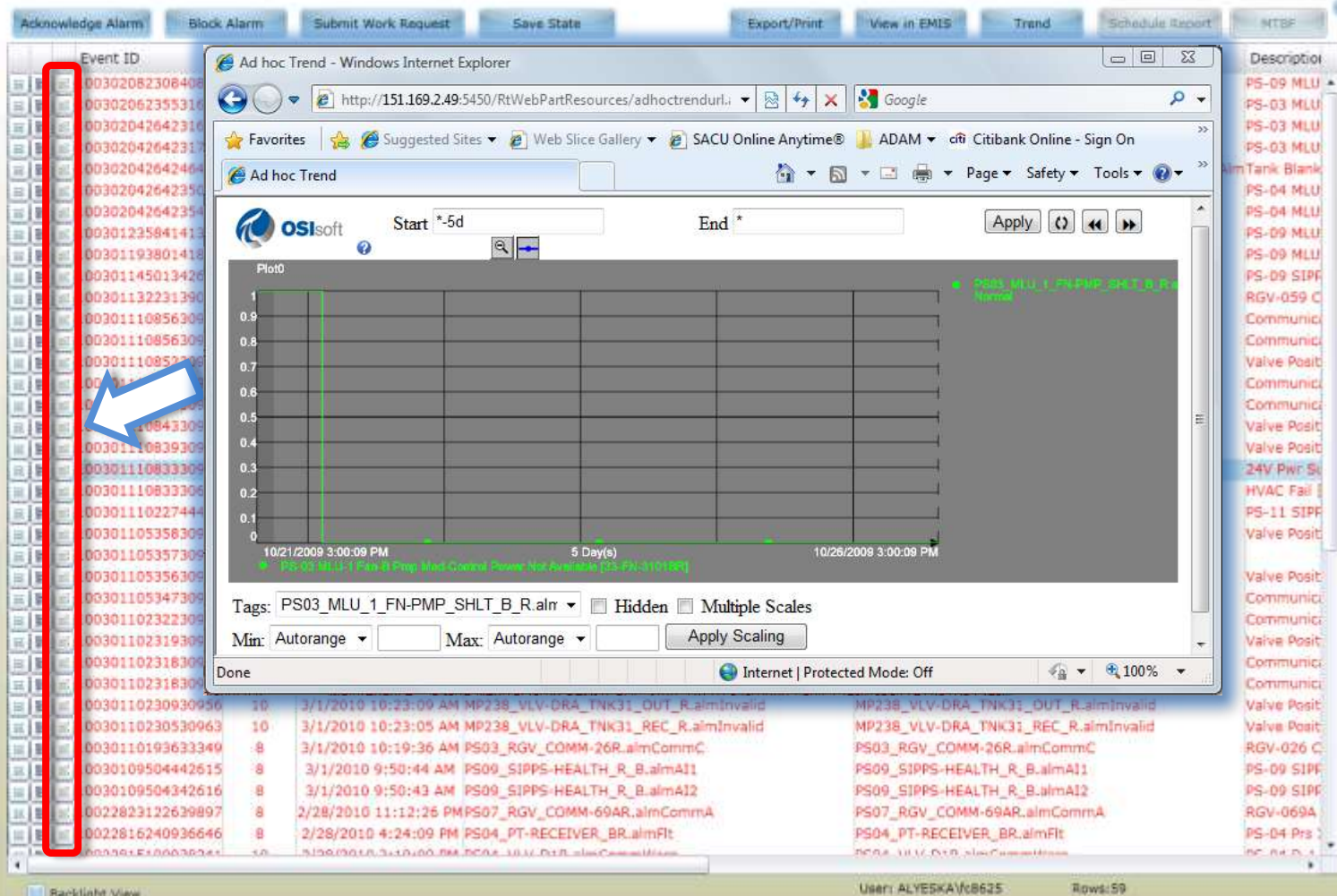
Alarm View

Show Active

Reset

Search

Export



Time Filter

Start Date

2/28/2010

15

Start Time

12:00 AM

End Date

3/2/2010

15

End Time

11:28 AM

☒ Auto Refresh

Tag Filter

Alarm Tag:

PI Tag:

MEL Tag:

MTL Tag:

Event ID:

Description:

Area Filter

Location

Show All

Point Source

Show All

Facility

Show All

System

Show All

SubSystem

Show All

Component Type

Show All

Class

Show All

Priority

Show All

Alarm View

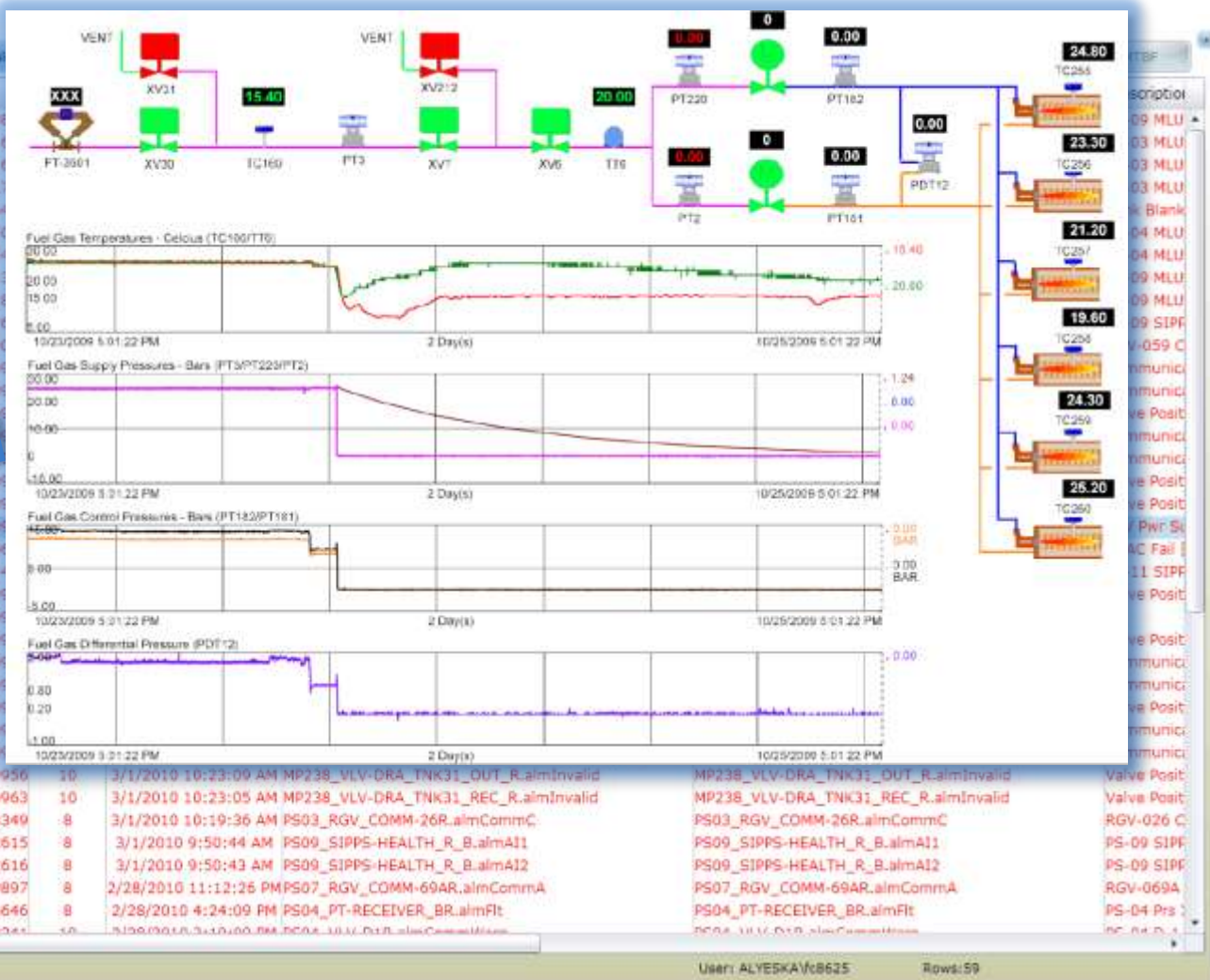
View Active

Reset

Search

Export

	Event ID
10030208230840	
10030206235531	
10030204264231	
10030204264231	
10030204264231	
10030204264235	
10030204264235	
10030123584141	
10030119380141	
10030114501342	
10030113223139	
10030111085630	
10030111085630	
10030111085230	
10030111084530	
10030111083930	
10030111083330	
10030111083330	
10030111022744	
10030110535830	
10030110535730	
10030110535630	
10030110534730	
10030110232230	
10030110231930	
10030110231830	
10030110231830	
10030110230930	
10030110230530	
10030110193633	
10030109504442	
10030109504342	
10022823122639	
10022816240936	
10022815200930	



Search Criteria

Time Filter

Start Date: 2/28/2010 ☐ Start Time: 12:00 AM ☐

End Date: 3/2/2010 ☐ End Time: 11:28 AM ☐

☒ Auto Refresh

Tag Filter

Alarm Tag:

PI Tag:

MEL Tag:

MTL Tag:

Event ID:

Description:

Area Filter

Location: Show All

Point Source: Show All

Facility: Show All

System: Show All

SubSystem: Show All

Component Type: Show All

Class: Show All

Priority: Show All

Alarm View: View Active

Reset Search Export

Acknowledge Alarm Block Alarm Submit Work Request Save State Export/Print View in EMIS Trend Schedule Report MTSF

Event ID Priority Time Stamp Alarm Tag PI Tag Description

10030208230840880
10030206235331668
10030204264231698
10030204264231700
10030204264246484
10030204264235010
10030204264235498
10030123584141365
10030119380141849
10030114501342617
10030113223139071
10030111085630969
10030111085630941
10030111085230928
10030111085230913
10030111085230927
10030111084330942
10030111083830942
1003011022744417
10030110535830921
10030110535730920
10030110535630914
10030110534730953
10030110232230962
10030110231930949
10030110231830948
10030110231830976
10030110230930956
10030110230530963
10030110193633349
10030109504442615
10030109504342616
10022823122639897
10022816240936646
10022816240936646

System View

- Booster Pumps
- Communications
- Crude Flow - Station
- Diesel Fuel Systems
- DPA
- Fire Detection
- Fuel Gas Systems
- Gas Detection
- Heat and Vent Systems
- LEPM
- M-L Relief
- PS01
- PS02
- PS04
- PS09
- Discharge
- Suction
- M-L Pipe
- MLU
- NOS
- Power Distribution
- Power Generation
- Refrigeration
- Scrapers
- Sumos
- Tanks
- Valves

System View/ML Relief/PS09

PI Display

Start Time: -2d End Time: Apply

Legend

Pipeline Mainline Relief System Status

Suction

Discharge

Crude Tank

20T0

38.9 F 14.8

OK Alarm Fault (DC) Fault (AC) DOT MOS

N2 Supply Pressure Transmitters

N2 Actuator Pressure Transmitters

Station Section Pressure & Relief Set Point

Station Discharge Pressure & Relief Set Point

Tank Level (LRA) ENRAF Temp

User: ALYESKA/Vic8625 Rows: 59

Search Criteria

Time Filter

Start Date: 2/28/2010 Start Time: 12:00 AM
End Date: 3/2/2010 End Time: 11:28 AM
☒ Auto Refresh

Tag Filter

Alarm Tag:
PI Tag:
MEL Tag:
MTL Tag:
Event ID:
Description:

Area Filter

Location: Show All
Point Source: Show All
Facility: Show All
System: Show All
SubSystem: Show All
Component Type: Show All
Class: Show All
Priority: Show All

Alarm View: View Active

Reset Search Export

Acknowledge Alarm

Block Alarm

Submit Work Request

Save State

Export/Print

View in EMIS

Trend

Schedule Report

MTBF

Event ID

1003020823084

1003020823553

1003020426423

1003020426423

1003020426423

1003020426423

1003020426423

1003012358414

1003011938014

1003011450134

1003011322313

1003011095830

1003011095830

1003011095230

1003011095230

1003011095230

1003011095230

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Maintenance Search

Alarm Tag:

PI Tag:

MEL Tag:

MTL Tag:

Network: P/L

Point Source: ALARMS

Facility: 20-RGV-101

System: RGV

SubSystem: BUILDING

Component Type: HVAC

Class: Show All

Priority: Show All

Reset Search Export

Matching Tags

PS10_RGV_AUX-101R.almBldgTemp

Matching Tag Count: 1

D_N_R View

PI D_N_R View

Alarm Tag: PS10_RGV_AUX-101R.almBldgTemp

Alarm Definition: RGV-101 - Equipment Room Temperature Alarm [20-RGV-101]

PI Tag: PS10_RGV_AUX-101R.almBldgTemp

PI Description: RGV-101 - Equipment Room Temperature Alarm [20-RGV-101]

Point Source: ALARMS

MEL Tag:

Cause Definition: Cat A site to cold:
1) Ormat heat loops not working
2) Winter/Summer loop not working

Effects Definition: RGV Building to Hot or Cold

Recommended Planning Actions

Recommended Maintenance Action

Priority: 8

Repair Time:

Maintenance Event Response Time: >12Hrs

DR Complete: ☒

DR Complete Date: 7/31/2007

Notification Time:

DR Complete User:

Export

MTL Tag: 20-RGV-101-BD

Description

PS-09 MLU

PS-03 MLU

PS-03 MLU

PS-03 MLU

RangeAimTank Blank

PS-04 MLU

PS-04 MLU

PS-09 MLU

PS-09 MLU

PS-09 SIPP

RGV-059 C

Communic

Communic

Valve Posit

Communic

Valve Posit

Valve Posit

Valve Posit

24V Pwr S

HVAC Fail

PS-11 SIPP

Valve Posit

Valve Posit

Valve Posit

Valve Posit

Valve Posit

Valve Posit

Valve Posit

Valve Posit

Valve Posit

Valve Posit

Valve Posit

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Search Criteria

Time Filter

Start Date: 2/28/2010 Start Time: 12:00 AM
 End Date: 3/2/2010 End Time: 11:36 AM
☒ Auto Refresh

Tag Filter

Alarm Tag:

PI Tag:

MEL Tag:

MTL Tag:

Event ID:

Description:

Area Filter

Location: Show All

Point Source: Show All

Facility: Show All

System: Show All

SubSystem: Show All

Acknowledge Alarm Block Alarm Submit Work Request Save State Export/Print View in EMIS Trend Schedule Report MTBF						
	Event ID	Priority	Time Stamp	Alarm Tag	PI Tag	Description
	10030208230840880	8	3/2/2010 8:23:08 AM	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
	10030206235531668	7	3/2/2010 6:23:55 AM	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS-03 MLU
	10030204264231698	8	3/2/2010 4:26:42 AM	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS-03 MLU
	10030204264231700	8	3/2/2010 4:26:42 AM	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS-03 MLU
	10030204264246484	10	3/2/2010 4:26:42 AM	PS01_TVP-DISCH_ANALOGS.TnkBlnkGasOutOfRangeAlm	PS01_TVP-DISCH_ANALOGS.TnkBlnkGasOutOfRangeAlm	Tank Blank
	10030204264235010	8	3/2/2010 4:26:42 AM	PS04_MLU_1_HVAC-R.almCOMMON	PS04_MLU_1_HVAC-R.almCOMMON	PS-04 MLU
	10030204264235498	9	3/2/2010 4:26:42 AM	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS-04 MLU
	10030123584141365	8	3/1/2010 11:58:41 PM	PS09_MLU_2_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_2_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
	10030119380141849	8	3/1/2010 7:38:01 PM	PS09_MLU_3_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_3_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
	10030114501342617	8	3/1/2010 2:50:13 PM	PS09_SIPPS-HEALTH_R_B.almAI3	PS09_SIPPS-HEALTH_R_B.almAI3	PS-09 SIPPS
	10030113223139071	8	3/1/2010 1:22:31 PM	PS05_RGV_COMM-59R.almCommC	PS05_RGV_COMM-59R.almCommC	RGV-059 C
	10030111085630969	9	3/1/2010 11:08:56 AM	MP238_VLV-DRA_T	P238_TT-DRA_INJ_R.almCommFlt	Communic
	10030111085630941	9	3/1/2010 11:08:56 AM	MP238_VLV-DRA_F	P238_VLV-DRA_RECVC_R.almPhaseErr	Communic
	10030111085230928	10	3/1/2010 11:08:52 AM	MP238_VLV-DRA_F	P238_VLV-DRA_PMP_A_OUT_R.almInvalid	Valve Posi
	10030111085230913	10	3/1/2010 11:08:52 AM	MP238_VLV-DRA_I	P238_VLV-DRA_INJ_1_R.almCommWarn	Communic
	10030111085230927	9	3/1/2010 11:08:52 AM	MP238_VLV-DRA_F	P238_VLV-DRA_PMP_A_OUT_R.almPhaseErr	Communic
	10030111084330942	10	3/1/2010 11:08:43 AM	MP238_VLV-DRA_F	P238_VLV-DRA_RECVC_R.almInvalid	Valve Posi
	10030111083930970	10	3/1/2010 11:08:39 AM	MP238_VLV-DRA_T	P238_VLV-DRA_TNK32_IN_R.almInvalid	Valve Posi
	10030111083330998	10	3/1/2010 11:08:33 AM	MP238_XS-4_R.alm	P238_XS-4_R.almProcess	24V Pwr Su
	10030111083330640	9	3/1/2010 11:08:33 AM	MP238_HVAC-DRA	P238_TT-DRA_BLDG_R.almHAlarm	HVAC Fail
	10030111022744417	8	3/1/2010 11:02:27 AM	PS11_SIPPS-HEALTH_R.almCommStsC	PS11_SIPPS-HEALTH_R.almCommStsC	PS-11 SIPPS
	10030110535830921	10	3/1/2010 10:53:58 AM	MP238_VLV-DRA_INJ_2_R.almInvalid	MP238_VLV-DRA_INJ_2_R.almInvalid	Valve Posi
	10030110535730920	9	3/1/2010 10:53:57 AM	MP238_VLV-DRA_INJ_2_R.almCommWarn	MP238_VLV-DRA_INJ_2_R.almCommWarn	Valve Posi
	10030110535630914	10	3/1/2010 10:53:56 AM	MP238_VLV-DRA_INJ_1_R.almInvalid	MP238_VLV-DRA_INJ_1_R.almInvalid	Valve Posi
	10030110534730955	9	3/1/2010 10:53:47 AM	MP238_VLV-DRA_TNK31_OUT_R.almCommWarn	MP238_VLV-DRA_TNK31_OUT_R.almPhaseErr	Communic
	10030110232230962	9	3/1/2010 10:23:22 AM	MP238_VLV-DRA_TNK31_REC_R.almCommWarn	MP238_VLV-DRA_TNK31_REC_R.almPhaseErr	Communic
	10030110231930949	10	3/1/2010 10:23:19 AM	MP238_VLV-DRA_TNK31_IN_R.almInvalid	MP238_VLV-DRA_TNK31_IN_R.almInvalid	Valve Posi
	10030110231830948	9	3/1/2010 10:23:18 AM	MP238_VLV-DRA_TNK31_IN_R.almCommWarn	MP238_VLV-DRA_TNK31_IN_R.almInvalid	Communic
	10030110231830976	9	3/1/2010 10:23:18 AM	MP238_VLV-DRA_TNK32_OUT_R.almCommWarn	MP238_VLV-DRA_PMP_B_OUT_R.almPhaseErr	Communic
	10030110230930956	10	3/1/2010 10:23:09 AM	MP238_VLV-DRA_TNK31_OUT_R.almInvalid	MP238_VLV-DRA_TNK31_OUT_R.almInvalid	Valve Posi

Block Alarm for a period of:

7d Pig Passage

[Block Alarm](#) [Cancel](#)

Search Criteria

Time Filter

Start Date: 1/31/2010 Start Time: 12:00 AM
 End Date: 3/2/2010 End Time: 11:48 AM
☒ Auto Refresh

Tag Filter

Alarm Tag:
 PI Tag:
 MEL Tag:
 MTL Tag:
 Event ID:
 Description:

Area Filter

Location: Show All
 Point Source: Show All
 Facility: Show All
 System: Show All
 SubSystem: Show All
 Component Type: Show All
 Class: Show All
 Priority: Show All

Alarm View: View Alarm
 Reset Search Export

Acknowledge Alarm Block Alarm Submit Work Request Save State Export/Print View in EMIS Trend Schedule Report RTBF

Event ID	Priority	Time Stamp	Alarm Tag	PI Tag	Description
10020213192140510	8	2/2/2010 1:19:21 PM	PS09_GEN-CTRL_MOD_R.almCommon	PS09_GEN-CTRL_MOD_R.almCommon	PS-09 Gen
10020208102838122	8	2/2/2010 8:10:28 AM	PS04_TT-HALLWAY4_R.almFit	PS04_TT-HALLWAY4_R.almFit	PS-04 Tmp
10020304104431411	8	2/3/2010 4:10:44 AM	PS03_LAN-03_R.almMaintSrvWanB	PS03_LAN-03_R.almMaintSrvWanB	Maint Serv
10020904142135498	9	2/9/2010 4:14:21 AM	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS-04 MLU
10020904142135498	9	2/9/2010 4:14:21 AM	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS-04 MLU
10020904142135498	9	2/9/2010 4:14:21 AM	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS-04 MLU
10020904142135498	9	2/9/2010 4:14:21 AM	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS-04 MLU
10020900244736646	8	2/9/2010 12:24:47 AM	PS04_PT-RECEIVER_BR.almFit	PS04_PT-RECEIVER_BR.almFit	PS-04 Prs
User: ALYESKA\178947 Time Acknowledged: 2/9/2010 12:24:47 AM Acknowledged Comment: faults on door open/close					
10020210274137838	9	2/2/2010 10:27:41 AM	PS04_SWG-BKR-DG_R.almSF6Gas	PS04_SWG-BKR-DG_R.almSF6Gas	PS-04 Swit
10020903264043169	9	2/9/2010 3:26:40 AM	PS09_VLV-M1R.almDNETFail	PS09_VLV-M1R.almDNETFail	PS-09 M-1
10020903264043169	9	2/9/2010 3:26:40 AM	PS09_VLV-M1R.almDNETFail	PS09_VLV-M1R.almDNETFail	PS-09 M-1
10020804133247013	9	2/8/2010 4:13:32 AM	PS09_BST_PMP-1.AlarmAlm	PS09_BST_PMP-1.AlarmAlm	Pump in al
10020804133247013	9	2/8/2010 4:13:32 AM	PS09_BST_PMP-1.AlarmAlm	PS09_BST_PMP-1.AlarmAlm	Pump in al
10020910473140880	8	2/9/2010 10:47:31 AM	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
10020910473140880	8	2/9/2010 10:47:31 AM	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
10020210510541857	8	2/2/2010 10:51:05 AM	PS09_MLU_3_PMP-LUBE_OIL2_R.almWarn	PS09_MLU_3_PMP-LUBE_OIL2_R.almWarn	PS-09 MLU
10020606021436031	8	2/6/2010 6:02:14 AM	PS04_MLU_3_PDSH-LUBE_OIL_FIL_R.almProcess	PS04_MLU_3_PDSH-LUBE_OIL_FIL_R.almProcess	PS-04 MLU
10020606021436031	8	2/6/2010 6:02:14 AM	PS04_MLU_3_PDSH-LUBE_OIL_FIL_R.almProcess	PS04_MLU_3_PDSH-LUBE_OIL_FIL_R.almProcess	PS-04 MLU
10020908460435569	8	2/9/2010 8:46:04 AM	PS04_MLU_2_PMP-LUBE_OIL1_R.almUnCmdChg	PS04_MLU_2_PMP-LUBE_OIL1_R.almUnCmdChg	PS-04 MLU
10020908460435569	8	2/9/2010 8:46:04 AM	PS04_MLU_2_PMP-LUBE_OIL1_R.almUnCmdChg	PS04_MLU_2_PMP-LUBE_OIL1_R.almUnCmdChg	PS-04 MLU
10020908204243094	10	2/9/2010 8:20:42 AM	PS09_VLV-D2R.almCommWarn	PS09_VLV-D2R.almCommWarn	PS-09 D-2
10020908204243094	10	2/9/2010 8:20:42 AM	PS09_VLV-D2R.almCommWarn	PS09_VLV-D2R.almCommWarn	PS-09 D-2
10020908265643094	10	2/9/2010 8:26:56 AM	PS09_VLV-D2R.almCommWarn	PS09_VLV-D2R.almCommWarn	PS-09 D-2
10020908265643094	10	2/9/2010 8:26:56 AM	PS09_VLV-D2R.almCommWarn	PS09_VLV-D2R.almCommWarn	PS-09 D-2
10020908223943168	10	2/9/2010 8:22:39 AM	PS09_VLV-M1R.almCommWarn	PS09_VLV-M1R.almCommWarn	PS-09 M-1
10020908223943168	10	2/9/2010 8:22:39 AM	PS09_VLV-M1R.almCommWarn	PS09_VLV-M1R.almCommWarn	PS-09 M-1
10020908282543168	10	2/9/2010 8:28:25 AM	PS09_VLV-M1R.almCommWarn	PS09_VLV-M1R.almCommWarn	PS-09 M-1
10020908282543168	10	2/9/2010 8:28:25 AM	PS09_VLV-M1R.almCommWarn	PS09_VLV-M1R.almCommWarn	PS-09 M-1
10020908282543168	10	2/9/2010 8:28:25 AM	PS09_VLV-M1R.almCommWarn	PS09_VLV-M1R.almCommWarn	PS-09 M-1
10020908282543168	10	2/9/2010 8:28:25 AM	PS09_VLV-M1R.almCommWarn	PS09_VLV-M1R.almCommWarn	PS-09 M-1
10020908222743181	10	2/9/2010 8:22:27 AM	PS09_VLV-M2R.almCommWarn	PS09_VLV-M2R.almCommWarn	PS-09 M-2
10020908222743181	10	2/9/2010 8:22:27 AM	PS09_VLV-M2R.almCommWarn	PS09_VLV-M2R.almCommWarn	PS-09 M-2
10020614551046818	8	2/6/2010 2:55:10 PM	PS04_LEFM-SUCT.MalfunctionAlm	PS04_LEFM-SUCT_R.almMalfunction	LEFM syste
10020614115930934	9	2/6/2010 2:11:59 PM	MP238_VLV-DRA_PMP_B_OUT_R.almCommWarn	MP238_VLV-DRA_INJ_2_R.almPhaseErr	Communic
10020614115930934	9	2/6/2010 2:11:59 PM	MP238_VLV-DRA_PMP_B_OUT_R.almCommWarn	MP238_VLV-DRA_INJ_2_R.almPhaseErr	Communic
10020308103825014	9	2/3/2010 8:10:38 AM	PS03_LAN-01_R.almMaintSrvWanB	PS03_LAN-01_R.almMaintSrvWanB	Maint Serv

Backlight View

User: ALYESKA\178947

Rows: 48

Search Criteria

Time Filter

Start Date: 1/31/2010 Start Time: 12:00 AM
 End Date: 3/2/2010 End Time: 11:54 AM
☒ Auto Refresh

Tag Filter

Alarm Tag:

PI Tag:

HEL Tag:

MTL Tag:

Event ID:

Description:

Area Filter

Location: Show All

Point Source: Show All

Facility: Show All

System: Show All

SubSystem: Show All

Component Type: Show All

Class: Show All

Priority: Show All

Alarm View: View Active

Reset Search Export

Acknowledge Alarm Block Alarm Submitt Work Request Save State Export/Print View in EMIS Trend Schedule Report MCBF

Event ID	Priority	Time Stamp	Alarm Tag	PI Tag	Description
10030211431441072	9	3/2/2010 11:43:14 AM	PS09_MLU_1_UCP-HEALTH_R.almPanelOpen	PS09_MLU_1_UCP-HEALTH_R.almPanelOpen	PS-09 MLU
10030208230840880	8	3/2/2010 8:23:08 AM	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
10030206235331688	7	3/2/2010 6:23:55 AM	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS-03 MLU
10030204264231698	8	3/2/2010 4:26:42 AM	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS-03 MLU
10030204264231700	8	3/2/2010 4:26:42 AM	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS-03 MLU
10030204264246484	10	3/2/2010 4:26:42 AM	PS01_TVP-DISCH_ANALOGS.TrkBlinkGasOutOfRangeAlm	PS01_TVP-DISCH_ANALOGS.TrkBlinkGasOutOfRangeAlm	Tank Blank
10030204264225010	8	3/2/2010 4:26:42 AM	PS04_MLU_1_HVAC-R.almCOMMON	PS04_MLU_1_HVAC-R.almCOMMON	PS-04 MLU
10030204264225498	9	3/2/2010 4:26:42 AM	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS-04 MLU

AlarmViewer 3.2.2010[1] - Microsoft Excel

Event ID	Time Stamp	Priority	Alarm Tag	Description	Alarm Type	PI Tag	MTL Tag	MEL Tag
1. 1.00302E+16	3/2/2010 11:43	9	PS09_MLU_1_UCP-HEALTH_R.almPanelOpen	PS-09 MLU-1 UCP Health-UCP Panel Door Open [39-UCP-4101R]	Maintenance	PS09_MLU_1_UCP-HEALTH_R.almPanelOpen	39-UCP-4101R	MLU1
2. 1.00302E+16	3/2/2010 6:23	7	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS-03 MLU-1 LoLo LvlSw Xfmr Oil-Level Low Low [33-XFM-4001R-71Q2]	Maintenance	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	33-XFM-4001R	POWER
3. 1.00302E+16	3/2/2010 4:26	8	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS-03 MLU-1 Mist Elim Lube Oil-Uncommanded Change of State [33-ME-3101R]	Maintenance	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	33-PK-3101R	MLU1
4. 1.00302E+16	3/2/2010 4:26	8	PS04_MLU_1_HVAC-R.almCOMMON	PS-04 MLU-1 HVAC - Common For HVAC & Uhs [34-HVAC-4101]	Maintenance	PS04_MLU_1_HVAC-R.almCOMMON	34-BD-4101R	MLU1

Ready

AlarmViewer 3.2.2010 1

10030109504442615	8	3/1/2010 9:50:44 AM	PS09_SIPPS-HEALTH_R_B.almAI1	PS09_SIPPS-HEALTH_R_B.almAI1	PS-09 SIP
10030109504442616	8	3/1/2010 9:50:43 AM	PS09_SIPPS-HEALTH_R_B.almAI2	PS09_SIPPS-HEALTH_R_B.almAI2	PS-09 SIP
10022823122639897	8	2/28/2010 11:12:26	PMP507_RGV_COMM-69AR.almCommA	PMP507_RGV_COMM-69AR.almCommA	RGV-069A

User: ALYESKA\fc8625 Rows: 213

Search Criteria

Time Filter

Start Date: 2/28/2010 15:12:00 AM
 End Date: 3/2/2010 15:11:40 AM
☒ Auto Refresh

Tag Filter

Alarm Tag:
 PI Tag:
 MEL Tag:
 MTL Tag:
 Event ID:
 Description:

Area Filter

Location: Show All
 Point Source: Show All
 Facility: Show All
 System: Show All
 SubSystem: Show All
 Component Type: Show All
 Class: Show All
 Priority: Show All

Alarm View: View Active

Reset Search Export

Event ID	Priority	Time Stamp	Alarm Tag	PI Tag	Description
10030208230840880	8	3/2/2010 8:23:08 AM	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS09_MLU_1_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
10030206235531668	7	3/2/2010 6:23:55 AM	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS03_MLU_1_LSL-XFMR_OIL_R.almProcess	PS-03 MLU
10030204264231698	8	3/2/2010 4:26:42 AM	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS03_MLU_1_ME-LUBE_OIL_R.almNoCtrlPwr	PS-03 MLU
10030204264231700	8	3/2/2010 4:26:42 AM	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS03_MLU_1_ME-LUBE_OIL_R.almUnCmdChg	PS-03 MLU
10030204264246484	10	3/2/2010 4:26:42 AM	PS01_TVP-DISCH_ANALOGS.TrnkBlinkGasOutOfRangeAlm	PS01_TVP-DISCH_ANALOGS.TrnkBlinkGasOutOfRangeAlm	Tank Blank
10030204264235010	8	3/2/2010 4:26:42 AM	PS04_MLU_1_HVAC-R.almCOMMON	PS04_MLU_1_HVAC-R.almCOMMON	PS-04 MLU
10030204264235498	9	3/2/2010 4:26:42 AM	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	PS-04 MLU
10030123584141365	8	3/1/2010 11:58:41 PM	J_2_PMP-LUBE_OIL1_R.almWarn	J_2_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
10030119380141849	8	3/1/2010 7:38:01 PM	J_3_PMP-LUBE_OIL1_R.almWarn	J_3_PMP-LUBE_OIL1_R.almWarn	PS-09 MLU
10030114501342617	8	3/1/2010 2:50:13 PM	PS-HEALTH_R_B.almAI3	PS-HEALTH_R_B.almAI3	PS-09 SIPP
10030113223139071	8	3/1/2010 1:22:31 PM	V_COMM-59R.almCommC	V_COMM-59R.almCommC	RGV-059 C
10030111085630969	9	3/1/2010 11:08:56 AM	F-DRA_INJ_R.almCommFit	F-DRA_INJ_R.almCommFit	Communic
10030111085630941	9	3/1/2010 11:08:56 AM	LV-DRA_RECVC_R.almPhaseErr	LV-DRA_RECVC_R.almPhaseErr	Communic
10030111085230928	10	3/1/2010 11:08:52 AM	LV-DRA_PMP_A_OUT_R.almInvalid	LV-DRA_PMP_A_OUT_R.almInvalid	Valve Posit
10030111085230913	10	3/1/2010 11:08:52 AM	LV-DRA_INJ_1_R.almCommWarn	LV-DRA_INJ_1_R.almCommWarn	Communic
10030111085230927	9	3/1/2010 11:08:52 AM	LV-DRA_PMP_A_OUT_R.almPhaseErr	LV-DRA_PMP_A_OUT_R.almPhaseErr	Communic
10030111084330942	10	3/1/2010 11:08:43 AM	LV-DRA_RECVC_R.almInvalid	LV-DRA_RECVC_R.almInvalid	Valve Posit
10030111083930970	10	3/1/2010 11:08:39 AM	LV-DRA_TNK32_IN_R.almInvalid	LV-DRA_TNK32_IN_R.almInvalid	Valve Posit
10030111083330998	10	3/1/2010 11:08:33 AM	S-4_R.almProcess	S-4_R.almProcess	24V Pwr S
10030111083330640	9	3/1/2010 11:08:33 AM	F-DRA_BLDG_R.almHAlarm	F-DRA_BLDG_R.almHAlarm	HVAC Fail
10030111022744417	8	3/1/2010 11:02:27 AM	PS-HEALTH_R.almCommStsC	PS-HEALTH_R.almCommStsC	PS-11 SIPP
10030110535830921	10	3/1/2010 10:53:58 AM	LV-DRA_INJ_2_R.almInvalid	LV-DRA_INJ_2_R.almInvalid	Valve Posit
10030110535730920	9	3/1/2010 10:53:57 AM	LV-DRA_INJ_2_R.almCommWarn	LV-DRA_INJ_2_R.almCommWarn	Valve Posit
10030110535630914	10	3/1/2010 10:53:56 AM	LV-DRA_INJ_1_R.almInvalid	LV-DRA_INJ_1_R.almInvalid	Valve Posit
10030110534730955	9	3/1/2010 10:53:47 AM	LV-DRA_TNK31_OUT_R.almPhaseErr	LV-DRA_TNK31_OUT_R.almPhaseErr	Communic
10030110232230962	9	3/1/2010 10:23:22 AM	LV-DRA_TNK31_REC_R.almPhaseErr	LV-DRA_TNK31_REC_R.almPhaseErr	Communic
10030110231930949	10	3/1/2010 10:23:19 AM	LV-DRA_TNK31_IN_R.almInvalid	LV-DRA_TNK31_IN_R.almInvalid	Valve Posit
10030110231830948	9	3/1/2010 10:23:18 AM	LV-DRA_TNK31_IN_R.almInvalid	LV-DRA_TNK31_IN_R.almInvalid	Communic
10030110231830976	9	3/1/2010 10:23:18 AM	LV-DRA_PMP_B_OUT_R.almPhaseErr	LV-DRA_PMP_B_OUT_R.almPhaseErr	Communic
10030110230930956	10	3/1/2010 10:23:09 AM	LV-DRA_TNK31_OUT_R.almInvalid	LV-DRA_TNK31_OUT_R.almInvalid	Valve Posit
10030110230530963	10	3/1/2010 10:23:05 AM	LV-DRA_TNK31_REC_R.almInvalid	LV-DRA_TNK31_REC_R.almInvalid	Valve Posit
10030110193633349	8	3/1/2010 10:19:36 AM	V_COMM-26R.almCommC	V_COMM-26R.almCommC	RGV-026 C
10030109504442615	8	3/1/2010 9:50:44 AM	PS-HEALTH_R_B.almAI1	PS-HEALTH_R_B.almAI1	PS-09 SIPP
10030109504342616	8	3/1/2010 9:50:43 AM	PS-HEALTH_R_B.almAI2	PS-HEALTH_R_B.almAI2	PS-09 SIPP
10022823122639897	8	2/28/2010 11:12:26 PM	PS07_RGV_COMM-69AR.almCommA	PS07_RGV_COMM-69AR.almCommA	RGV-069A
10022816240936646	8	2/28/2010 4:24:09 PM	PS04_PT-RECEIVER_BR.almFit	PS04_PT-RECEIVER_BR.almFit	PS-04 Prs

Send Work Request Email

To: chris.wiseman@alyeska.com

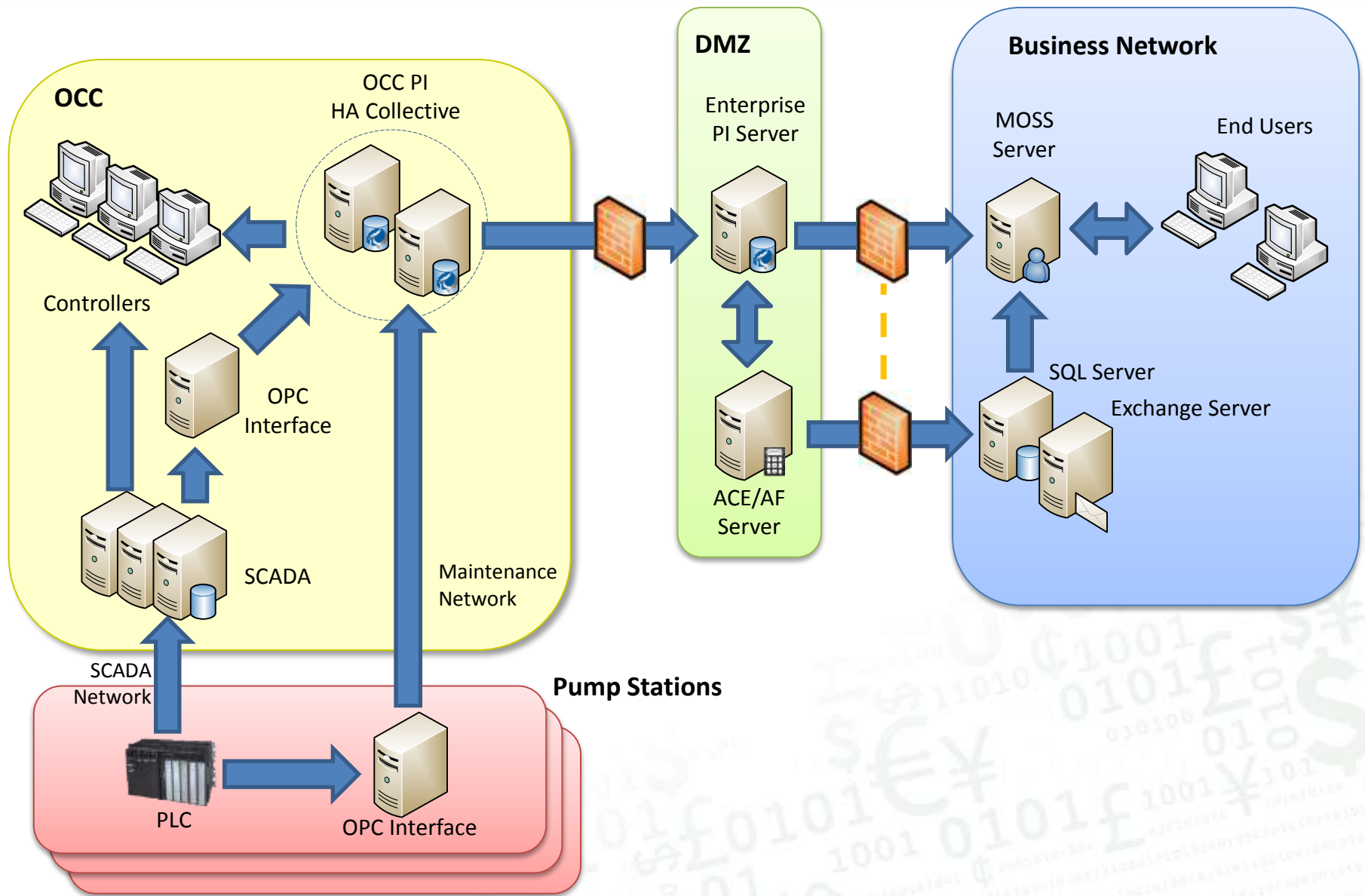
From: nick.wiley@casne.com













Subject: Work Order Request: 39-P-3304R

Body
 Need Date: 3/2/2010 12:00:00 AM
 Description: PS-09 MLU-3 Lube Oil Pmp #1 - E3+ in a Warning Condition [39-P-3304R]
 Unit: PS09
 OPS System:
 MTL Tag: 39-P-3304R
 Priority: 3
 Discipline: (E)lectrical
 Comments: This needs to be done ASAP.
 Requestor Name: ALYESKA\fc8625

Click: here to view Trend

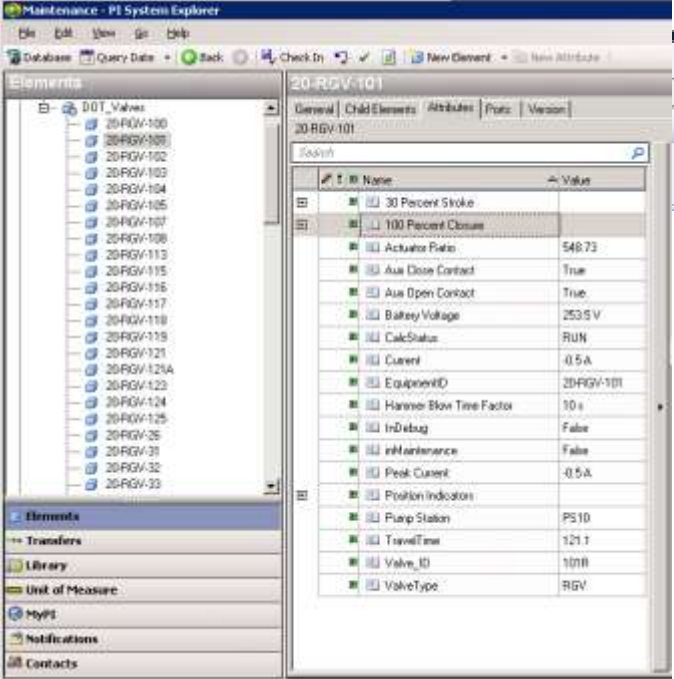
Submit Cancel



System Need	Solution
Real-time Data Storage	PI Enterprise Server 
Relational Data Storage	Microsoft SQL Server 
System Modeling	Asset Framework (AF) 
Continuous Monitoring Algorithms	Advanced Computing Engine Asset Framework (AF) Casne .NET Code Assemblies   
Alarm & Event Notifications	Asset Framework, PI Notifications  Casne Web Services  Outlook & Microsoft Exchange Server 
User Interaction	PI WebParts  Casne WebParts  Microsoft Office SharePoint Server (MOSS) 

Analysis Framework & Advanced Computing Engine

- Foundation of our architecture
 - Model assets to Alyeska standard system / subsystem / component hierarchy
 - Re-usable structured logic for asset-based Continuous Monitoring
 - Integrate disparate data sources
 - Provides notifications architecture
 - Platform for continuous monitoring of similar equipment types



Name	Value
30 Percent Stroke	
100 Percent Closure	
Actuator Ratio	548.73
Aux Close Contact	True
Aux Open Contact	True
Battery Voltage	253.5 V
CalcStatus	RUN
Current	0.5 A
EquipmentID	20-RGV-101
Hammer Blow Time Factor	10 s
InDebug	False
InMaintenance	False
Peak Current	0.5 A
Position Indication	
Pump Station	PS10
TravelTime	121.1
Valve_ID	101R
ValveType	RGV

```
' Set time period for Debug purposes
' Position_InFullOpen.ExeTime = New AFTIME

goLog.Log("Execution Time: " & Format(New AFTIME, "HH:mm:ss"))

' Get current Digital State for Valve
loTemp = Position_InFullOpen.PrevVal(Pos)
If IsNumeric(loTemp) Then
    cVal = CDB1(loTemp)
Else
    Throw New ACE_Exception("FATAL Except")
End If
cTime = New AFTIME(Position_InFullOpen.P
```

Microsoft Office SharePoint Server & PI WebParts

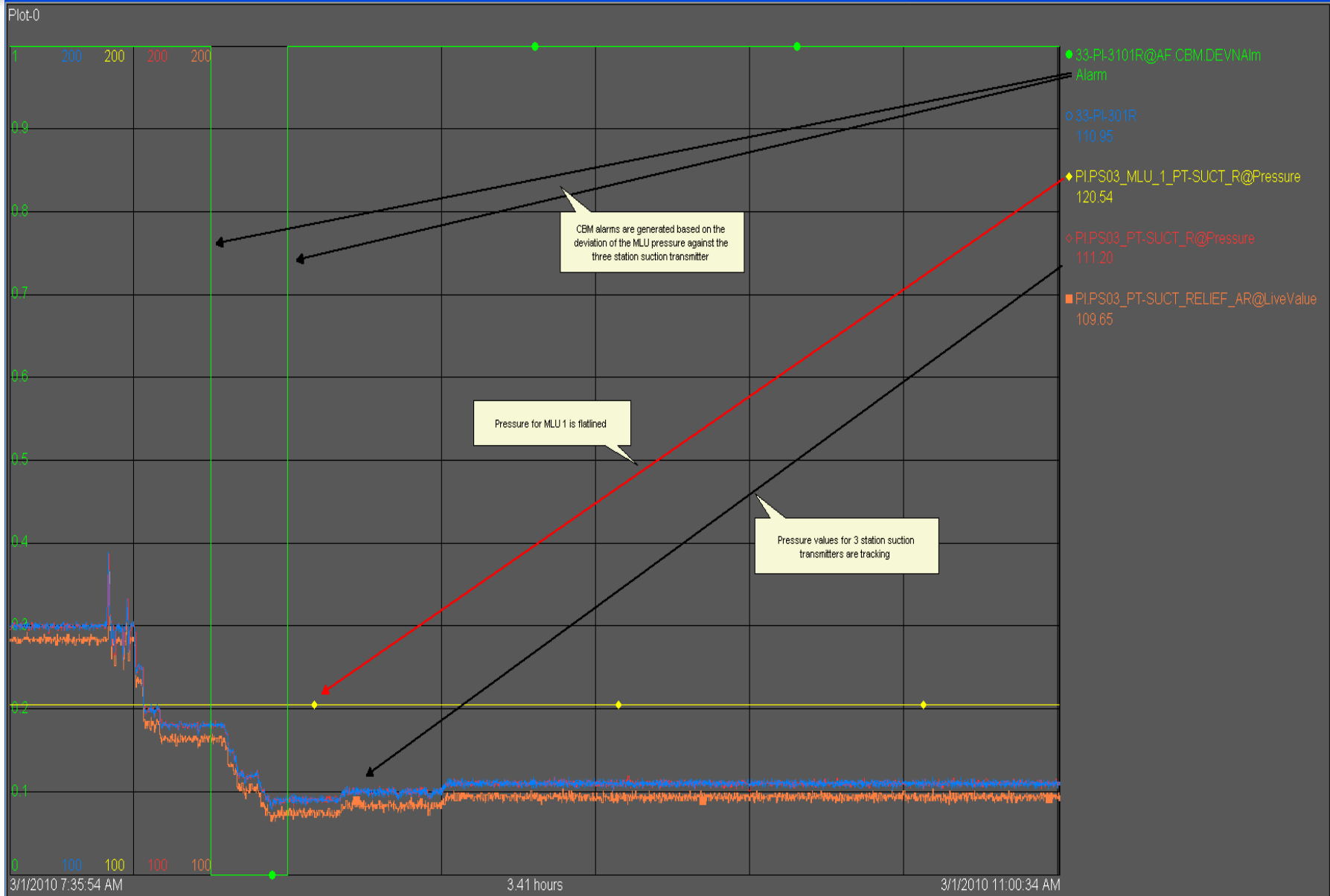
- Primary Visualization for Enterprise
 - MOSS for team collaboration, document management, access control
 - RtGraphic WebPart for ProcessBook graphics & trends
 - RtTrend WebPart for Web-based reports
 - RtTreeView WebPart for Navigation
 - Specialized Silverlight WebParts as required



RESULTS

The EDRC has demonstrated tremendous value:

- ❖ Centralized access to equipment and system diagnostics
- ❖ Automating 200+ Calendar/Runtime-based PMs
- ❖ Facilitating new Condition-Based Monitoring (CBM) algorithms
- ❖ Providing post mortem and root cause analysis on equipment failures
- ❖ Communicating initial equipment diagnostics with Operations Engineering, OCC, Field Maintenance, and other SMEs
- ❖ Assisting field maintenance with troubleshooting and validating corrective actions taken in the field
- ❖ Reducing intrusive maintenance impacts
- ❖ Preventing unintended shutdowns and equipment outages



TANGIBLE BENEFITS

EDRC BENEFIT	ANNUAL SAVINGS
Regulatory Calendar-based PM Automation	
DOT Valve Strokes – Reduced Field Man-Hours	\$400,000
Function Testing of Valves – Reduced Field Man-Hours	\$100,000
DOT Relief Valve Testing	\$50,000
Tank Level PM's	\$35,000
Continuous CBM and PBM Algorithms	
Unplanned Downtime Avoidance	\$350,000
Device Deviation Monitoring – Reduced Field Man Hrs	\$150,000
FIRST YEAR SAVINGS	\$1,085,000

Next Steps

- Additional Asset Modeling in AF
- Additional CM and Predictive algorithms
- Integrate predictive tools (SmartSignal)
- Expand Diagnostics and Resource Center to include MTBF, KPI's & Dashboards
- Add MOC alerts for control system Automation Genome
- Explore Work Management Systems that will allow for tighter integration



Maintenance & Diagnostics Center

This Site: Maintenance & Diagn

Site Actions

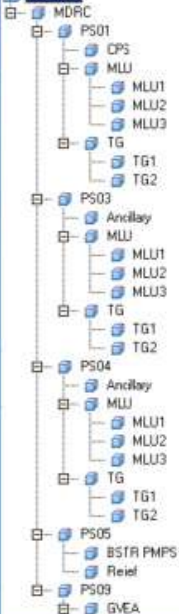
View All Site Content

Engineering

Environment

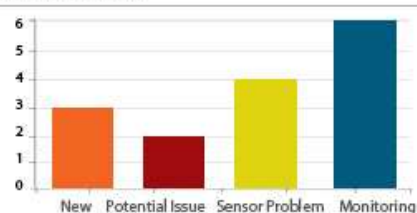
Maintenance &
Diagnostics Center

Elements



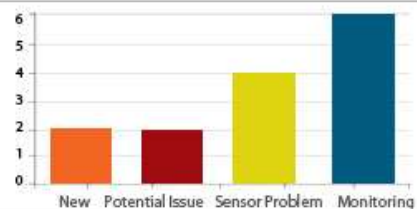
STATUS SUMMARY

PUMP



Incidents	Work Orders	Trend
12	9	↑

TG



Incidents	Work Orders	Trend
14	13	→

THREATS

PS 04



TG-1



TG-2

2 New

PS 03



TG-1



TG-2

1 Potential Issue

RECENT EVENTS AND ACTIVITY

RECENT PREDICTIVE ALARMS

Time	Asset	Message	Density	Actual
9/8/2010 10:53	PS03_MLU_1	PUMP PRESSURE RATIO HIGH		7.232 RATIO
9/8/2010 06:51	PS09_MLU_2	NDE Thrust Pos LOW		0.3199 MILS
9/6/2010 15:43	33-TG2	Oil Filter Diff Pressure HIGH		0.9668 PSIG
9/5/2010 13:31	34-TG1	Mtr Winding Temp HIGH		117.486 DEG F

Completed PM's

Completed	Location	Tag	Description
9/11/2010 11:53	PS05	35-MOV-20BL1	DOT Stroke
9/13/2010 08:41	PS03	33-VFD01	Alarm Archive
9/16/2010 12:23	VMT	54-V110	Valve Function Test

RECENT CBM ALARMS

Event Time	Tag	Priority	Duration
5/24/2010 10:26	34-LI-3104R@AF.PBM.RORAlm	7	10 min
5/24/2010 06:54	33-LI-CRUDE_TNK_LVL@AF.CBM.DEVNAIm	7	12 min
5/24/2010 02:16	34-LI-3951R@AF.CBM.ENAIm	7	2 min
5/23/2010 22:05	39-LI-3304R@AF.PBM.RORAlm	7	1 min

PLANNED MAINTENANCE EVENTS

Due Date	Location	Tag	Description
10/2/2010 10:53	PS04	34-GD-0401R	Fire System
10/5/2010 06:51	PS09	RGV-98A	DOT Stroke
10/18/2010 15:43	PS09	RGV-101	DOT Stroke

Maintenance & Diagnostics Center

This Site: Maintenance & Diagn

Maintenance & Diagnostics Center Equipment Hierarchy Alarms D & R MTBF PM's

Site Actions

View All Site Content

Engineering

Environment

Maintenance & Diagnostics Center

- Lists
- Documents
- Discussions
- Documents
- Lists
- People and Groups
- Sites
- Equipment Hierarchy
- Maintenance Strategies
- Planning & Scheduling

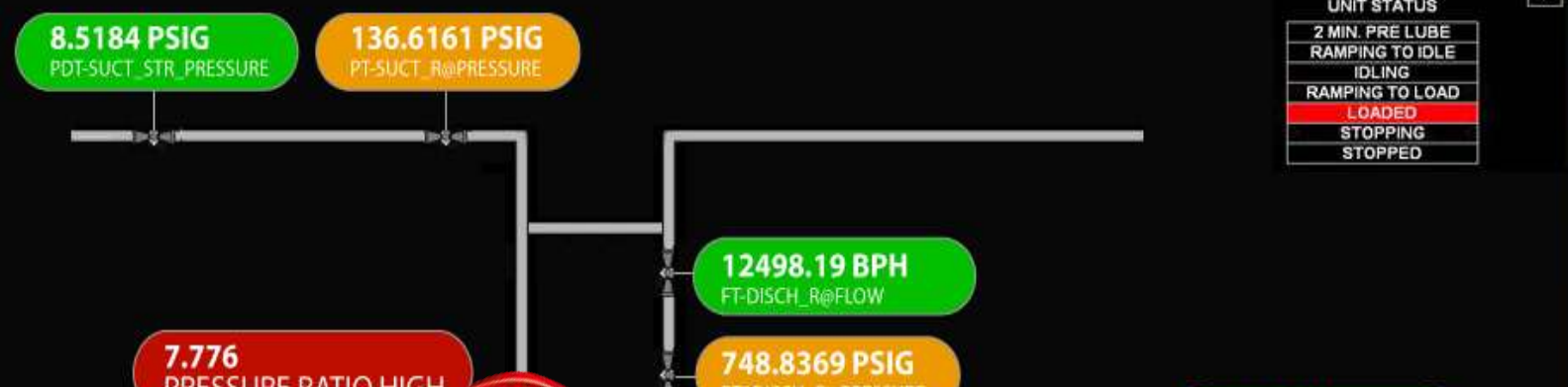
Oil Movements Department

- Analytical Lab Services
- Measurements
- OCC
- SCADA/OES
- Scheduling

Recycle Bin



PUMP STATION 03 MAIN LINE UNIT 3 PERFORMANCE



7.776
PRESSURE RATIO HIGH

incident action

Action: ☐ Note ☒ Acknowledge ☐ Defer ☐ Cancel Defer ☐ Dismiss

Code:

Notes:

None

Monitoring

Potential Issue

Potential Issue - Sensor Problem

Potential Issue - Diagnosis

Potential Issue - Recommended Actions

Resolution

Submit Reset

Address <http://dev-dxc:5450/MDC/Shared%20Documents/MeanTimeBetweenFailure.aspx>
 Go

Share Browser WebEx

Maintenance & Diagnostics Center

[Maintenance & Diagnostics Center](#) [Equipment Hierarchy](#) [Maintenance Strategies](#) [Planning & Scheduling](#)

This Site: Maintenance & Diagn

Site Actions

Maintenance & Diagnostics Center > Shared Documents > MeanTimeBetweenFailure

MeanTimeBetweenFailure

Search Criteria

Start Date 1/1/2010
Start Time
End Date 9/14/2010
End Time☒ Auto Refresh**System** Show All**SubSystem** Show All**Facility** Show All**Ancillary** Show All**MTBF View** Show All

Reset

Search

Export

Add Event

Annotate Event

Exclude Event

Export/Print

Save

View MTBF Analysis

Event ID	Event Name	Event Start Time	Event End Time	DownTime (hh:mm)	Facility	System	SubSystem	A
03100619060415	Pump Station: 03 - Shutdown	6/19/2010 6:04:15 AM	6/20/2010 3:57:19 PM	33.53				
03100727085321SD	Pump Station: 03 - Shutdown	7/27/2010 8:53:21 AM	7/27/2010 9:16:09 AM	00.23				
03100731060323SD	Pump Station: 03 - Shutdown	7/31/2010 6:03:23 AM	8/1/2010 1:36:14 PM	31.33				
03100817005650SD	Pump Station: 03 - Shutdown	8/17/2010 12:56:50 AM	8/17/2010 1:17:58 AM	00.21				
04100619060502	Pump Station: 04 - Shutdown	6/19/2010 6:05:02 AM	6/20/2010 3:57:51 PM	33.52				
04100703204926SD	Pump Station: 04 - Shutdown	7/3/2010 8:49:26 PM	7/3/2010 9:36:24 PM	00.47				
04100711183332SD	Pump Station: 04 - Shutdown	7/11/2010 6:33:32 PM	7/11/2010 6:58:16 PM	00.25				
04100727083027SD	Pump Station: 04 - Shutdown	7/27/2010 8:30:27 AM	7/27/2010 9:16:28 AM	00.46				
04100731060430SD	Pump Station: 04 - Shutdown	7/31/2010 6:04:30 AM	8/1/2010 1:36:28 PM	31.32				
0410080303325SD	Pump Station: 04 - Shutdown	8/3/2010 3:33:25 AM	8/3/2010 3:45:25 AM	00.12	20-RGV-102	CONTROL MODULE	GAS DETECTION E	
04100817003103SD	Pump Station: 04 - Shutdown	8/17/2010 12:31:03 AM	8/17/2010 12:52:01 AM	00.21				
04100901141801SD	Pump Station: 04 - Shutdown	9/1/2010 2:18:01 PM	9/1/2010 2:53:43 PM	00.35				
09100619063416	Pump Station: 09 - Shutdown	6/19/2010 6:34:16 AM	6/20/2010 2:28:30 PM	31.54				
09100703204913SD	Pump Station: 09 - Shutdown	7/3/2010 8:49:13 PM	7/3/2010 9:15:46 PM	00.26				
09100711183334SD	Pump Station: 09 - Shutdown	7/11/2010 6:33:34 PM	7/11/2010 6:42:05 PM	00.09	20-RGV-102	CONTROL MODULE	BUILDING	E
09100727083039SD	Pump Station: 09 - Shutdown	7/27/2010 8:30:39 AM	7/27/2010 8:55:02 AM	00.25				
09100731063947SD	Pump Station: 09 - Shutdown	7/31/2010 6:39:47 AM	8/1/2010 1:03:40 PM	30.24				
09100817003031SD	Pump Station: 09 - Shutdown	8/17/2010 12:30:31 AM	8/17/2010 12:39:12 AM	00.09				
09100901141810SD	Pump Station: 09 - Shutdown	9/1/2010 2:18:10 PM	9/1/2010 2:40:54 PM	00.22				
1100622161800	PS04, shut down	6/22/2010 4:18:00 PM	6/22/2010 4:18:00 PM	00.00	PS04	CONTROL MODULE	MCC	
1100629113100SD	Event Test - Manual	6/29/2010 11:31:00 AM	6/30/2010 11:31:00 AM	24.00				
1100630114300SD	Test event - Manual	6/30/2010 11:43:00 AM	6/30/2010 11:43:00 AM	00.00				
301232010114100	Pump Station:3 - Shutdown	1/23/2010 11:41:00 AM	1/23/2010 12:09:00 PM	00.28				
303042010143400	Pump Station:3 - Shutdown	3/4/2010 2:34:00 PM	3/4/2010 2:57:00 PM	00.23				
304032010155300	Pump Station:3 - Shutdown	4/3/2010 3:53:00 PM	4/3/2010 6:30:00 PM	2.37				
304062010094600	Pump Station:3 - Shutdown	4/6/2010 9:46:00 AM	4/6/2010 10:25:00 AM	00.39				
304072010085500	Pump Station:3 - Shutdown	4/7/2010 8:55:00 AM	4/7/2010 12:11:00 PM	3.16				
304082010081800	Pump Station:3 - Shutdown	4/8/2010 8:18:00 AM	4/8/2010 12:27:00 PM	4.9		BOOSTER PUMPS		
304262010142000	Pump Station:3 - Shutdown	4/26/2010 2:20:00 PM	4/26/2010 2:48:00 PM	00.28				
304302010075700	Pump Station:3 - Shutdown	4/30/2010 7:57:00 AM	4/30/2010 8:13:00 AM	00.16				
305182010101200	Pump Station:3 - Shutdown	5/18/2010 10:12:00 AM	5/18/2010 10:26:00 AM	00.14	20-RGV-116			E
305252010090600	Pump Station:3 - Shutdown	5/25/2010 9:06:00 AM	5/28/2010 4:45:00 PM	79.39				
306082010040900	Pump Station:3 - Shutdown	6/8/2010 4:09:00 AM	6/8/2010 4:21:00 AM	00.12				
402212010090600	Pump Station:4 - Shutdown	2/21/2010 9:06:00 AM	2/21/2010 9:18:00 AM	00.12				
403022010164200	Pump Station:4 - Shutdown	3/2/2010 4:42:00 PM	3/2/2010 7:12:00 PM	2.30				
403272010125300	Pump Station:4 - Shutdown	3/27/2010 12:53:00 PM	3/27/2010 1:31:00 PM	00.38				
404032010155500	Pump Station:4 - Shutdown	4/3/2010 3:55:00 PM	4/3/2010 6:28:00 PM	2.33				
404062010094500	Pump Station:4 - Shutdown	4/6/2010 9:45:00 AM	4/6/2010 10:24:00 AM	00.39	20-RGV-101			
404072010085500	Pump Station:4 - Shutdown	4/7/2010 8:55:00 AM	4/7/2010 12:11:00 PM	3.16				

Event Count: 0 Average Downtime: 0 Max Downtime: 0 Cumulative Downtime: 0

User: ALYESKA\174250 Event Count: 54

Shared Documents - MTBFAAnalysis - Microsoft Internet Explorer provided by Alyeska

Viewing p's Desktop

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address http://dev-dxc:5450/MDC/Shared%20Documents/MTBFAAnalysis.aspx Go Links

Google Go Bookmarks Check AutoLink AutoFill Send to Settings

Share Browser WebEx

Maintenance & Diagnostics Center Equipment Hierarchy Maintenance Strategies Planning & Scheduling Site Action

Maintenance & Diagnostics Center > Shared Documents > MTBFAAnalysis

MTBFAAnalysis

MTBFAAnalysisSearchBar Web Part

MTBFAAnalysis Web Part

Search Criteria

Start Date1/1/201015Start Time12:00 AM

End Date9/14/201015End Time1:26 PM

☒ Auto Refresh

SystemShow All

SubSystemShow All

FacilityShow All

AncillaryShow All

MTBF ViewShow All

Reset

Search

Export

MTBF Analysis

Trend Event

Edit Event

Event ID	Event Name	Event Start Time	Event End Time	DownTime	Total Time	Cummulative Downtime	Availability	Time since Previous E
404062010094500	Pump Station:4 - Shutdown	4/6/2010 9:45:00 AM	4/6/2010 10:24:00 AM	00:00:39	95:09:45	00:00:39	100%	
404082010081800	Pump Station:4 - Shutdown	4/8/2010 8:18:00 AM	4/8/2010 12:27:00 PM	00:04:09	97:08:18	00:04:48	99.96%	12:11:00
304082010081800	Pump Station:3 - Shutdown	4/8/2010 8:18:00 AM	4/8/2010 12:27:00 PM	00:04:09	97:08:18	00:08:57	99.61%	-04:09:00
405052010021300	Pump Station:4 - Shutdown	5/5/2010 2:13:00 AM	5/5/2010 2:26:00 AM	00:00:13	124:02:13	00:09:10	99.69%	26.13:46:00
305182010101200	Pump Station:3 - Shutdown	5/18/2010 10:12:00 AM	5/18/2010 10:26:00 AM	00:00:14	137:10:12	00:09:24	99.71%	13.07:46:00
405312010133200	Pump Station:4 - Shutdown	5/31/2010 1:32:00 PM	5/31/2010 1:54:00 PM	00:00:22	150:13:32	00:09:46	99.72%	13.03:06:00
1100629113100SD	Event Test - Manual	6/29/2010 11:31:00 AM	6/30/2010 11:31:00 AM	01:00:00	179:11:31	01:09:46	99.21%	28.21:37:00
1100630114300SD	Test event - Manual	6/30/2010 11:43:00 AM	6/30/2010 11:43:00 AM	00:00:00	180:11:43	01:09:46	99.22%	00:12:00
09100711183334SD	Pump Station: 09 - Shutdown	7/11/2010 6:33:34 PM	7/11/2010 6:42:05 PM	00:00:09	191:18:34	01:09:55	99.26%	11.06:50:34
04100803033325SD	Pump Station: 04 - Shutdown	8/3/2010 3:33:25 AM	8/3/2010 3:45:25 AM	00:00:12	214:03:33	01:10:07	99.33%	22.08:51:20

Customize Chart

X Axis:

Y Axis:

View Saved Charts

Root Causes of Pipeline Slowdowns and Shutdowns

External

Human

Equipment

Design

Unknown

Add Chart

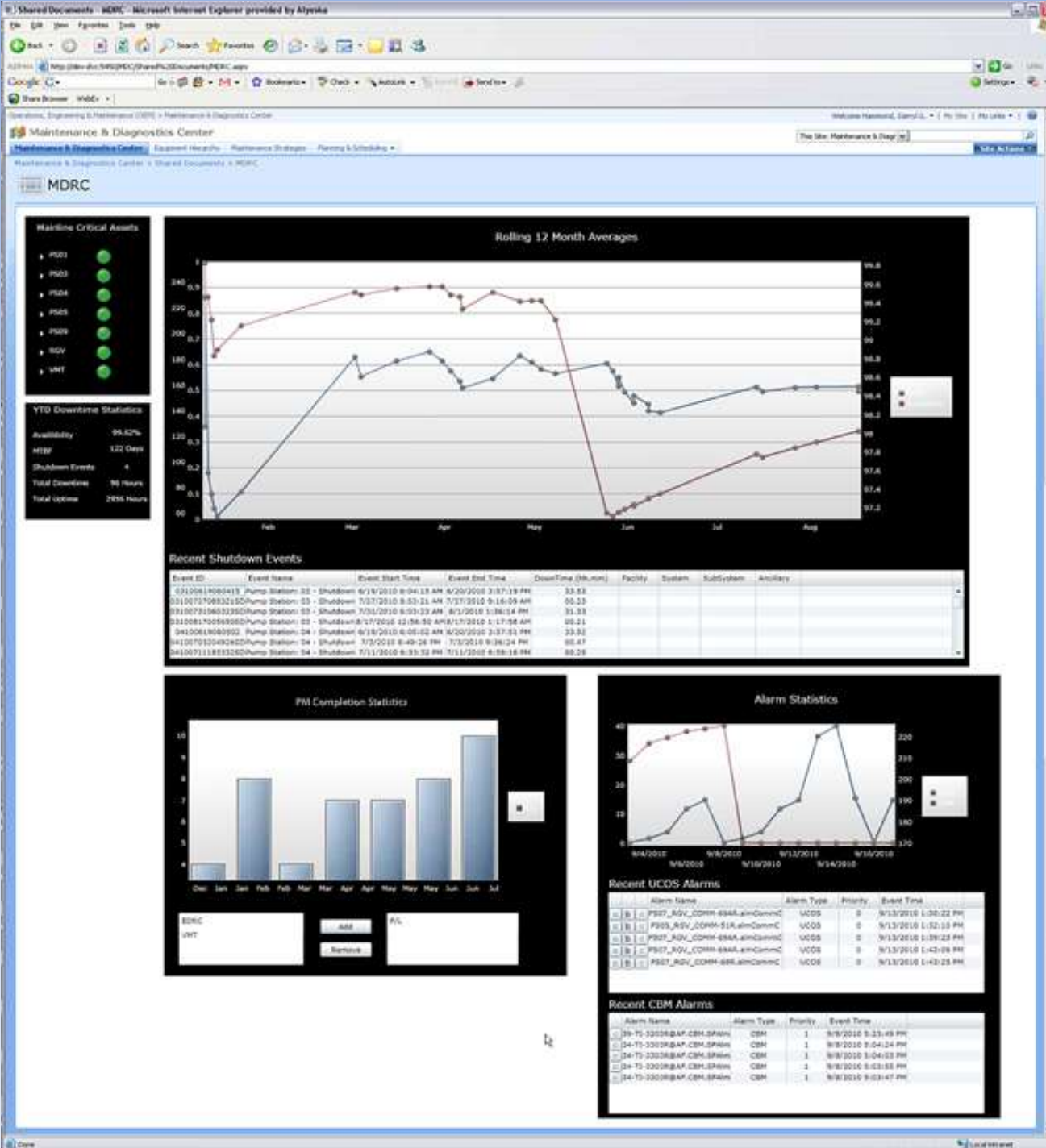
Export Chart

Remove Chart

Clear Chart

Done

Local intranet





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Thank you

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