



**OSI**soft®

**UC**2010

**Real Time Information** — Currency of the New Decade

Hilton San Francisco Union Square | San Francisco, CA

**April 26-28, 2010**

# Achieving Reliability-Centered Maintenance and Diagnostics with the PI System

Darryl Hammond

Maintenance Strategies Program Lead

Alyeska Pipeline Service Company



Nick Wiley

Managing Partner, Integration Services

Casne Engineering, Inc.



# AGENDA

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

# ABOUT CASNE ENGINEERING

- Engineering & technology integration services
- Specialties: Power, I&C, Software Integration & Development
- Applications: Utilities, Industrial Process, Data Centers
- 30 year track record
- Employee-owned practice
- HQ in Washington State
- Distributed workforce with international reach





# 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



Brooks Range





Tanana River Bridge Crossing



Valdez Terminal





## 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?

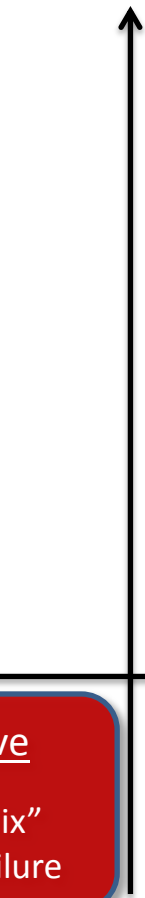
*Reliability-Centered Maintenance is a process used to determine what must be done to ensure that any physical asset continues to do what its users expect in its present operating context. ~Moubray, RCM II (1992)*

- ✓ 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



Predictive

Model-Based  
Learning Systems

Condition-based

Continuous

Automated Readings  
Automated Analysis

Instrumented

Automated Readings  
Manual Analysis

Operator Rounds  
Manual Readings  
Manual Analysis

Preventative

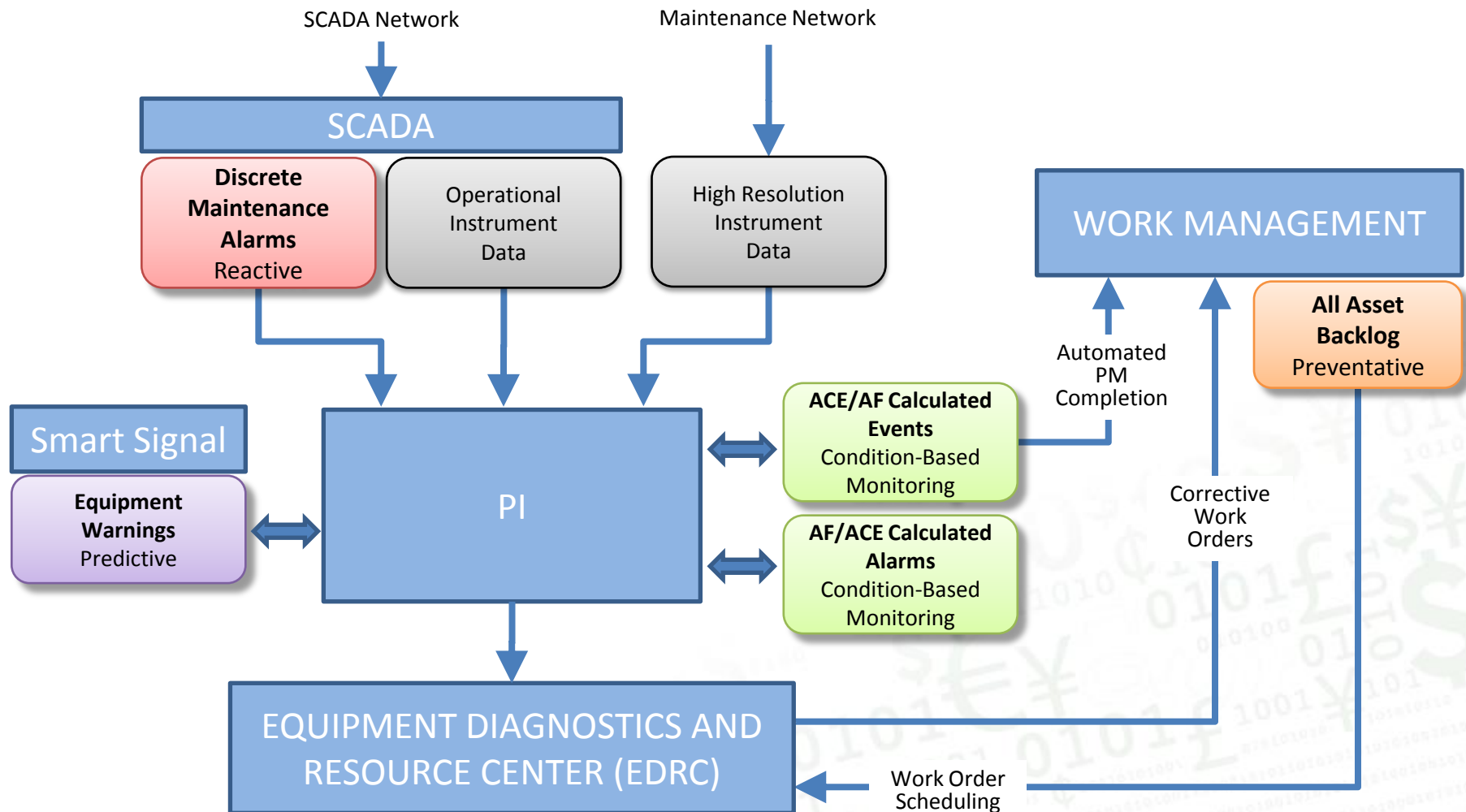
Calendar-based  
Runtime-based

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

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
- Lists
- 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

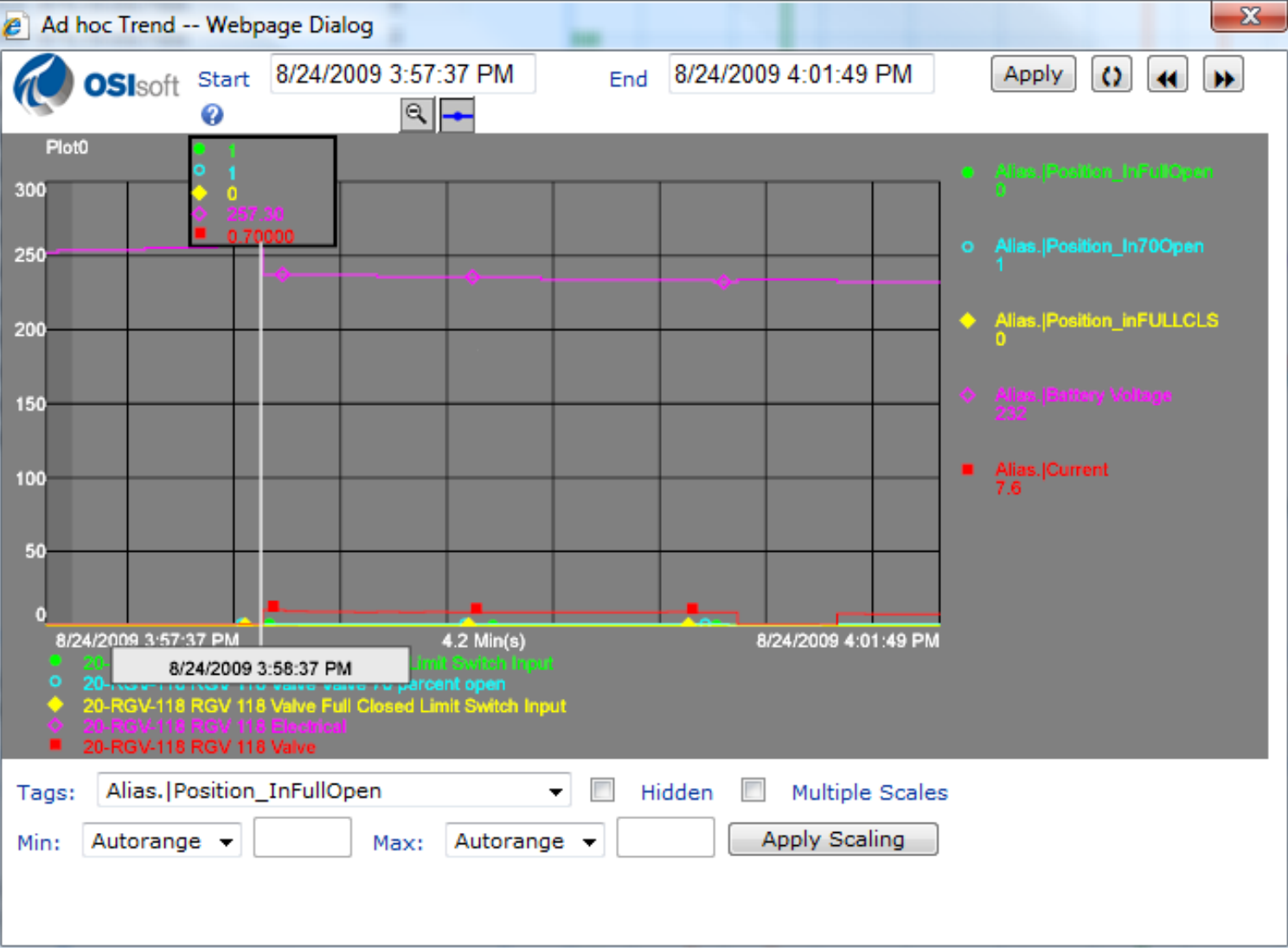
Event Viewer

All Asset Backlog

# MAINTENANCE EVENT SUMMARY

CLOSE EVENT

- Equip Tag
- 20-RGV-8
  - 20-RGV-9
  - 20-RGV-9
  - 20-RGV-9
  - 20-RGV-1
  - 20-RGV-1
  - 20-RGV-12
  - 20-RGV-1
  - 20-RGV-1
  - 20-RGV-1
  - 20-RGV-1
  - 20-RGV-1
  - 20-RGV-1
  - 20-RGV-1



Equipment

Event Time

Description

Stroke Area

Close Time

Close Time

Close Time

Close (Sta

Close (End

Current (Average)	9.02	Current (Average)	7.03
Voltage (Average)	235.17	Voltage (Average)	231.49

V 118 Electrical  
V 118 Valve



## Maintenance &amp; Diagnostics Center

This Site: Maintenance &amp; Diagn ▾



Maintenance &amp; Diagnostics Center

Equipment Hierarchy

Maintenance Strategies

Planning &amp; Scheduling ▾

Site Actions ▾

View All Site Content

Engineering

Environment

Maintenance &  
Diagnostics Center

- Documents
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- Maintenance Strategies
- Planning & Scheduling

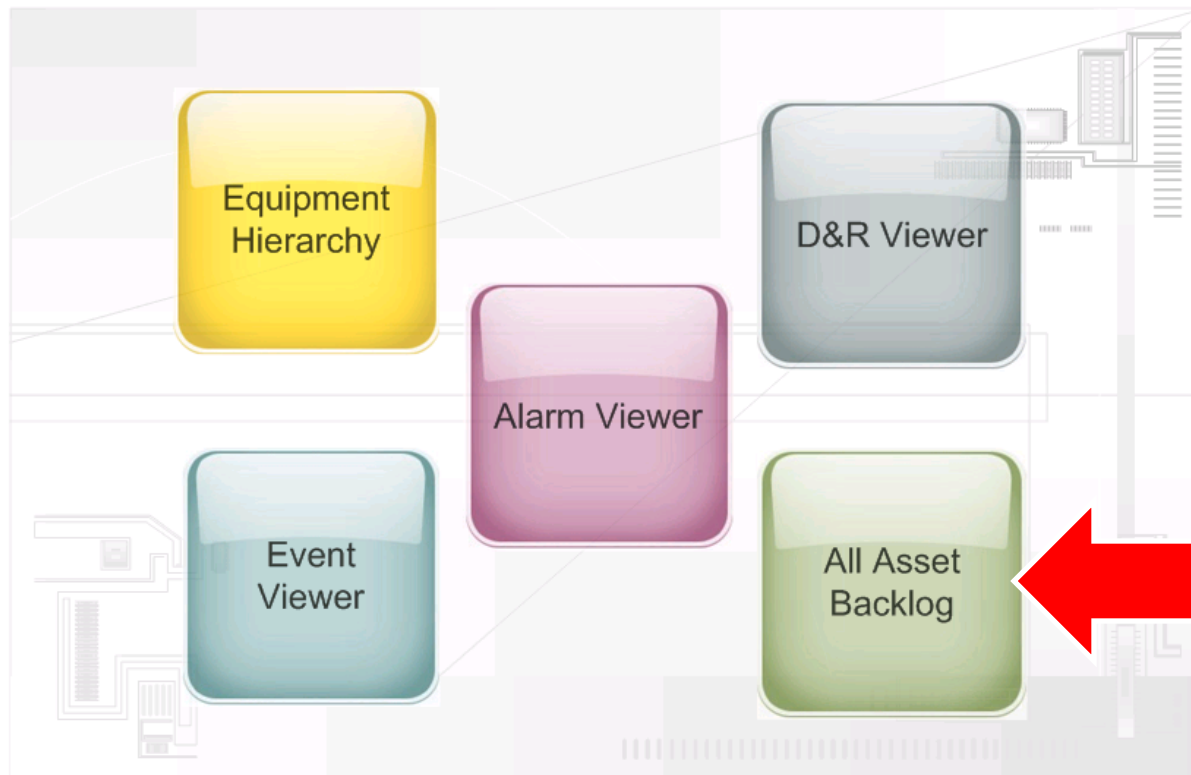
Oil Movements  
Department

- Analytical Lab Services
- Measurements
- OCC
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- Scheduling

Recycle Bin

## Announcements ▾

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☐ Add new announcement



# 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	

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

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## Maintenance & Diagnostics Center

This Site: Maintenance & Diagnr

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

View All Site Content

**Engineering**

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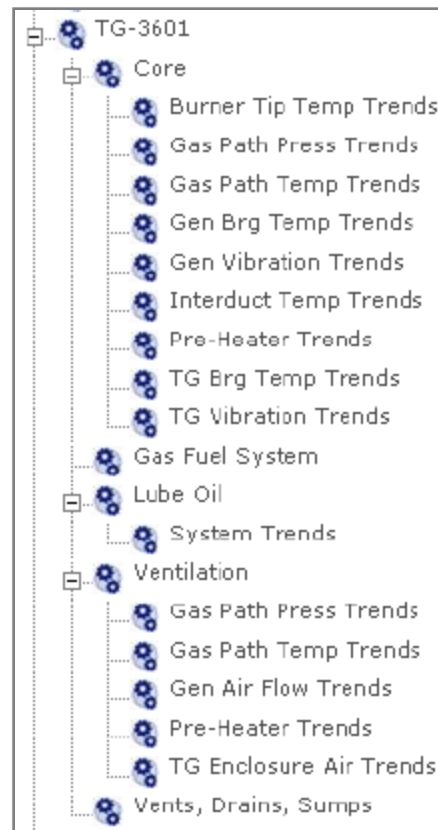
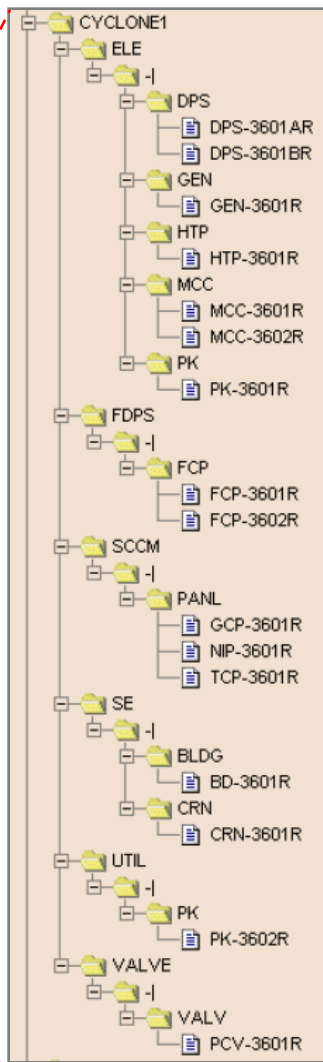
Recycle Bin

### Announcements

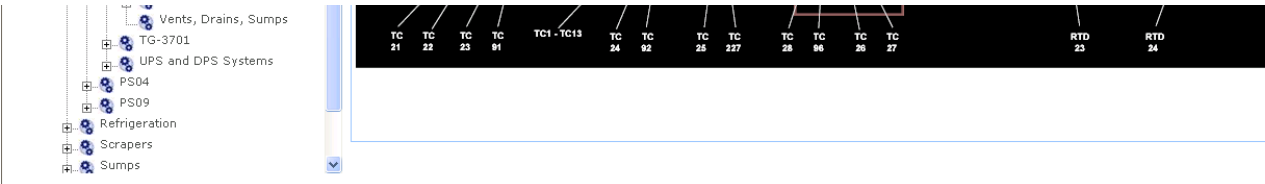
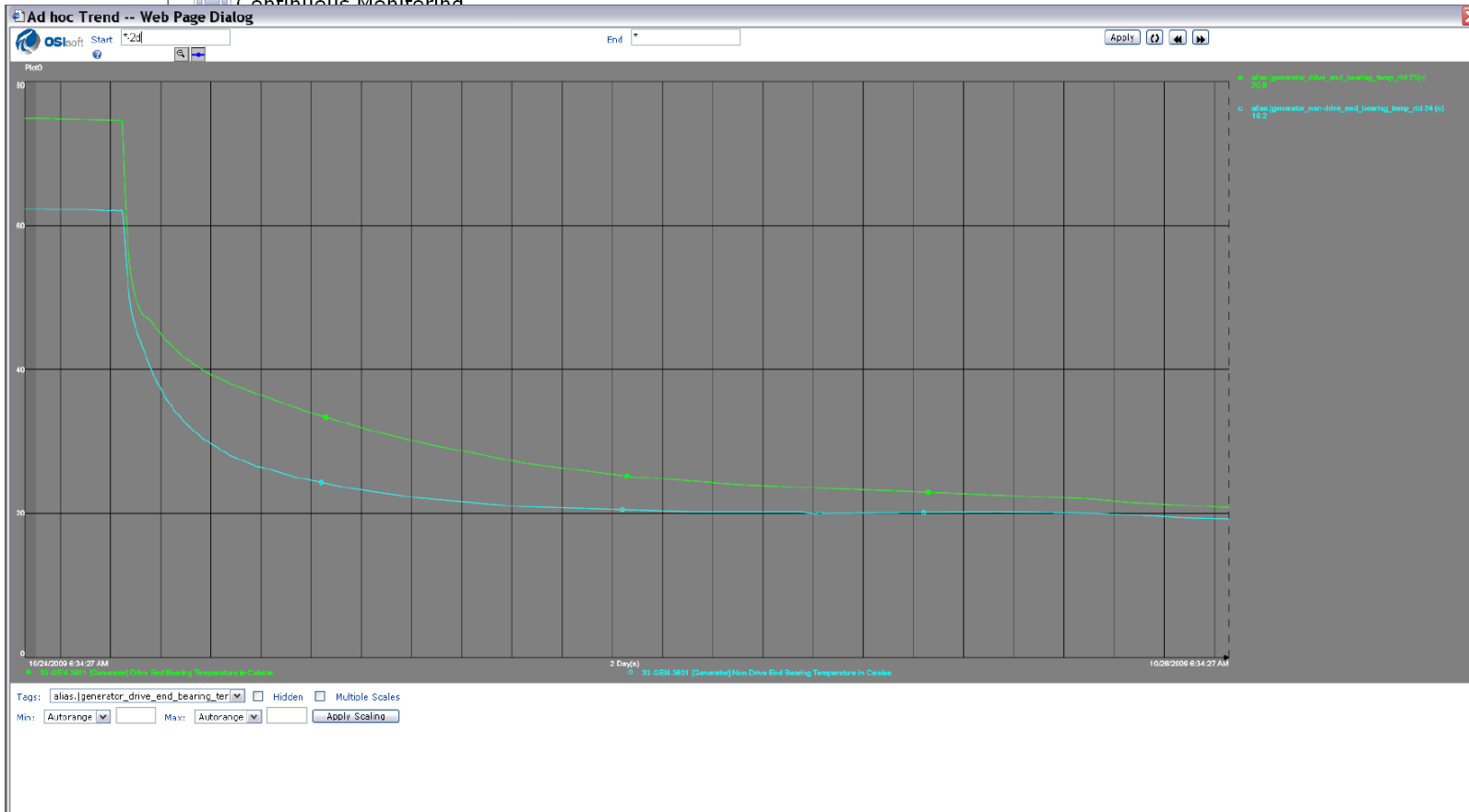
There are currently no active announcements. To add a new announcement, click "Add new announcement" below.

☐ Add new announcement

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







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All Asset Backlog

# 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 levers open

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

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Equipment Hierarchy

Alarm Viewer

Event Viewer

All Asset Backlog

X Viewer

# Alarm Management

Shared Documents - Alarm Viewer - Windows Internet Explorer

http://dev-dxc:5450/MDC/Shared%20Documents/Alarm%20Viewer.aspx

Snagit

Favorites Suggested Sites Get More Add-ons

Casne Engineering Portal - ... Shared Documents - Al...

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

Welcome Chandler, Robert W | My Site | My Links

This Site: Maintenance & Diagn

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 Trend Schedule Report MTBF

	Event ID	Priority	Time Stamp	Alarm Tag	PI Tag	Description
	10030214135440854	8	3/2/2010 2:13:54 PM	PS09_MLU_1_PDSH-LUBE_OIL_FIL_R.almProcess	PS09_MLU_1_PDSH-LUBE_OIL_FIL_R.almProcess	PS-09 MLU-1 H
	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 Comr
	10030214000039897	8	3/2/2010 2:00:00 PM	PS07_RGV_COMM-69AR.almCommA	PS07_RGV_COMM-69AR.almCommA	RGV-069A Comr
	10030213551039890	8	3/2/2010 1:55:10 PM	PS07_RGV_COMM-68R.almCommA	PS07_RGV_COMM-68R.almCommA	RGV-068 Comr
	10030212504635078	8	3/2/2010 12:50:46 PM	PS04_MLU_1_PMP-LUBE_OIL1_R.almGndFlt	PS04_MLU_1_PMP-LUBE_OIL1_R.almGndFlt	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.almHVAC1DNET	PS04_MLU_2_HVAC-R.almHVAC1DNET	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.TnkBlnkGasOutOfRangeAlm	PS01_TVP-DISCH_ANALOGS.TnkBlnkGasOutOfRangeAlm	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
	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-1 L
	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-1 L



## Search Criteria

**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

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

**Event ID**

00302082308408  
 00302062355316  
 00302042642316  
 00302042642317  
 00302042642464  
 00302042642350  
 00302042642354  
 00301235841418  
 00301193801418  
 00301145013426  
 00301132231390  
 00301110856309  
 00301110856309  
 00301110852709  
 00301110843309  
 00301110839309  
 00301110833309  
 00301110833309  
 00301110833309  
 00301110227444  
 00301105358309  
 00301105357309  
 00301105356309  
 00301105347309  
 00301102322309  
 00301102319309  
 00301102318309  
 00301102318309  
 0030110230930956  
 0030110230530963  
 0030110193633349  
 0030109504442615  
 0030109504342616  
 0022823122639897  
 0022816240936646  
 0022815100238241

**Ad hoc Trend - Windows Internet Explorer**

http://151.169.2.49:5450/RtWebPartResources/adhochtrendurl...

Ad hoc Trend

Start: \*5d End: \* Apply

Plot0

10/21/2009 3:00:09 PM 5 Day(s) 10/26/2009 3:00:09 PM

PS03\_MLU\_1\_FN-PMP\_SHLT\_B\_R.alm

Tags: PS03\_MLU\_1\_FN-PMP\_SHLT\_B\_R.alm Hidden Multiple Scales

Min: Autorange Max: Autorange Apply Scaling

Done

Internet | Protected Mode: Off

User: ALYESKA\fc8625 Rows:59

**Description**

PS-09 MLU  
 PS-03 MLU  
 PS-03 MLU  
 PS-03 MLU  
 Alarm Tank Blank  
 PS-04 MLU  
 PS-04 MLU  
 PS-09 MLU  
 PS-09 MLU  
 PS-09 MLU  
 PS-09 SIPP  
 RGV-059 C  
 Communic  
 Communic  
 Valve Posit  
 Communic  
 Valve Posit  
 Valve Posit  
 24V Pwr Su  
 HVAC Fail  
 PS-11 SIPP  
 Valve Posit  
 Valve Posit  
 Communic  
 Communic  
 Communic  
 Valve Posit  
 Valve Posit  
 RGV-026 C  
 PS-09 SIPP  
 PS-09 SIPP  
 RGV-069A  
 PS-04 Prs  
 PS-04 Prs

## Search Criteria

**Time Filter**

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

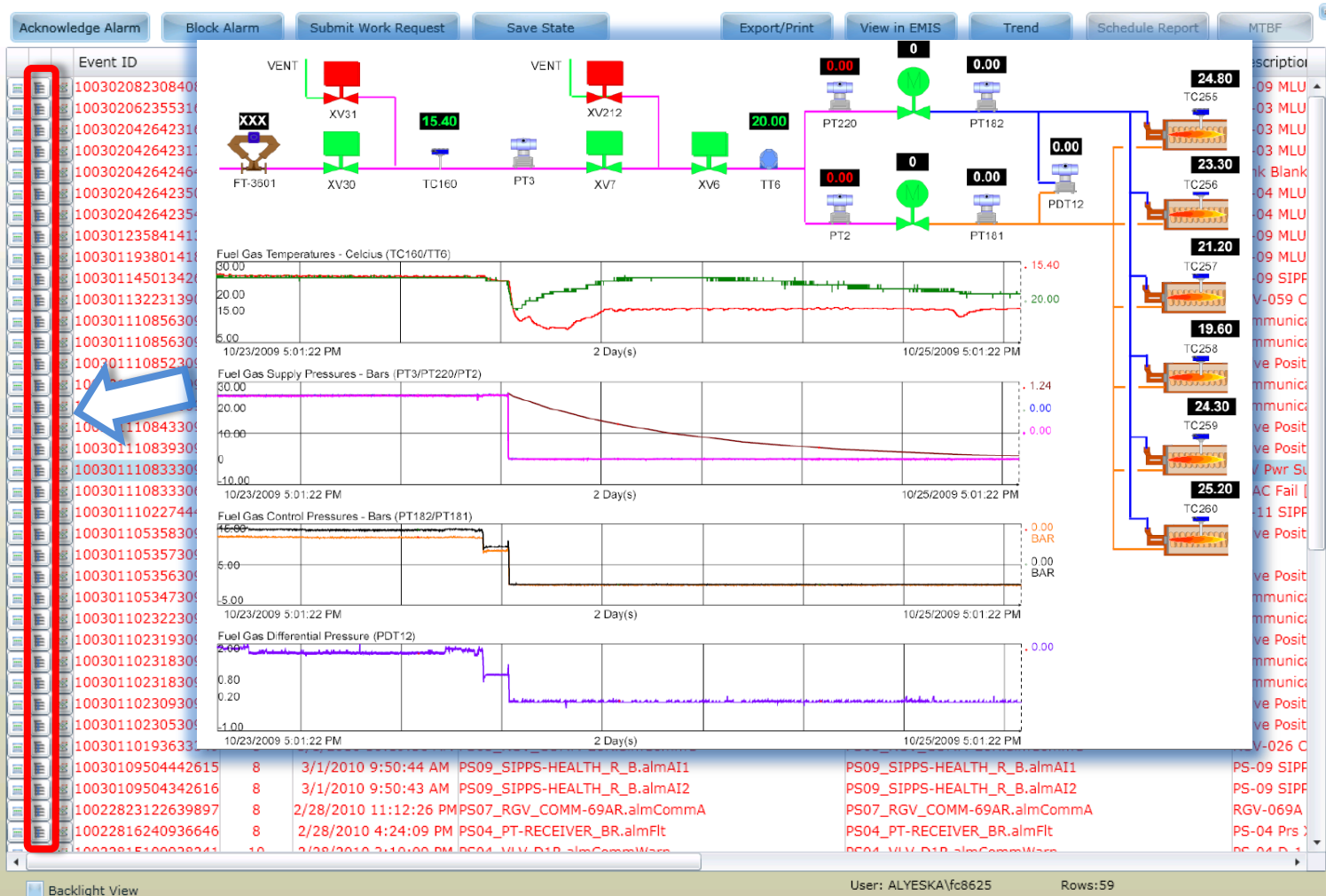
**Tag Filter**

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



# Search Criteria

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

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

Start Time

\*-2d

End Time

\*

Apply

System View

Booster Pumps

Communications

Crude Flow - Station

Diesel Fuel Systems

DRA

Fire Detection

Fuel Gas Systems

Gas Detection

Heat and Vent Systems

LEFM

M/L Relief

PS01

PS03

PS04

PS05

PS09

Discharge

Suction

M-L Pipe

MLU

MOS

Power Distribution

Power Generation

Refrigeration

Scrapers

Sumps

Tanks

Valves

System View/M/L Relief/PS09

Legend

PI Display

Suction

x04A

x04B

x04C

Discharge

x05A

x05B

20T0

Crude Tank

38.9 F

14.8

OK

Alarm

Fault (DC)

Fault (AC)

DOT

MOS

x04A

x04B

x04C

x05A

x05B

OK

Alarm

Fault

No Data

MOS

ML Pressure Transmitters

x04AR

x04BR

x05AR

x05BR

OK

Alarm

Fault

No Data

MOS

137.7

137.5

981.3

979.1

N2 Supply Pressure Transmitters

x04A

x04B

x04C

x05A

x05B

OK

Alarm

Fault

No Data

MOS

1538

1371

1686

1562

2327

N2 Actuator Pressure Transmitters

x04A

x04B

x04C

x05A

x05B

OK

Alarm

Fault

No Data

MOS

101.5

105.7

100.5

104.7

98.7

Station Suction Pressure & Relief Set Point

10/19/2009 7:57:11 AM

2 Day(s)

10/21/2009 7:57:11 AM

Station Discharge Pressure & Relief Set Point

10/19/2009 7:57:11 AM

2 Day(s)

10/21/2009 7:57:11 AM

Tank Levels (Level, ENRAF, Temp)

10/19/2009 7:57:11 AM

2 Day(s)

10/21/2009 7:57:11 AM

User: ALYESKA/fc8625

Rows:59



## Search Criteria

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

Acknowledge Alarm

Block Alarm

Submit Work Request

Save State

Export/Print

View in EMIS

Trend

Schedule Report

MTBF

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 leaves open

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:

DR Complete Date

7/31/2007

DR Complete User

Export

Event ID	Description
1003020823084	PS-09 MLU
1003020623553	PS-03 MLU
1003020426423	PS-03 MLU
1003020426423	PS-03 MLU
1003020426424	RangeAlm Tank Blank
1003020426423	PS-04 MLU
1003020426423	PS-04 MLU
1003012358414	PS-09 MLU
1003011938014	PS-09 MLU
1003011450134	PS-09 SIPP
1003011322313	RGV-059 C
1003011108563	Communic
1003011108563	Communic
1003011108523	Valve Posit
1003011108523	Communic
1003011108433	Valve Posit
1003011108393	Valve Posit
1003011108333	24V Pwr Su
1003011108333	HVAC Fail
1003011102274	PS-11 SIPP
1003011053583	Valve Posit
1003011053573	Valve Posit
1003011053563	Valve Posit
1003011053473	Valve Posit
1003011023223	RGV-026 C
1003011023193	PS-09 SIPP
1003011023183	PS-09 SIPP
1003011023183	PS-09 SIPP
1003011023093	RGV-069A
1003011023053	PS-04 Prs
1003011019363	PS-04 Prs
1003010950442615	PS03_RGV_COMM-26R.almCommC
1003010950442615	PS09_SIPPS-HEALTH_R_B.almAI1
1003010950442615	PS09_SIPPS-HEALTH_R_B.almAI2
1003010950442615	PS09_SIPPS-HEALTH_R_B.almAI2
10022823122639897	PS07_RGV_COMM-69AR.almCommA
10022823122639897	PS07_RGV_COMM-69AR.almCommA
10022816240936646	PS04_PT-RECEIVER_BR.almFlt
10022816240936646	PS04_PT-RECEIVER_BR.almFlt
10022816240936646	PS04_PT-RECEIVER_BR.almFlt
10022816240936646	PS04_PT-RECEIVER_BR.almFlt

Backlight View

User: ALYESKA\fc8625

Rows:59

## 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

<div> <div>Acknowledge Alarm</div> <div>Block Alarm</div> <div>Submit Work Request</div> <div>Save State</div> <div>Export/Print</div> <div>View in EMIS</div> <div>Trend</div> <div>Schedule Report</div> <div>MTBF</div> </div>							
	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 SIPP	
	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	Communica	
	10030111085630941	9	3/1/2010 11:08:56 AM	MP238_VLV-DRA_F	P238_VLV-DRA_RECYC_R.almPhaseErr	Communica	
	10030111085230928	10	3/1/2010 11:08:52 AM	MP238_VLV-DRA_F	P238_VLV-DRA_PMP_A_OUT_R.almInvalid	Valve Posit	
	10030111085230913	10	3/1/2010 11:08:52 AM	MP238_VLV-DRA_I	P238_VLV-DRA_INJ_1_R.almCommWarn	Communica	
	10030111085230927	9	3/1/2010 11:08:52 AM	MP238_VLV-DRA_F	P238_VLV-DRA_PMP_A_OUT_R.almPhaseErr	Communica	
	10030111084330942	10	3/1/2010 11:08:43 AM	MP238_VLV-DRA_F	P238_VLV-DRA_RECYC_R.almInvalid	Valve Posit	
	10030111083930970	10	3/1/2010 11:08:39 AM	MP238_VLV-DRA_T	P238_VLV-DRA_TNK32_IN_R.almInvalid	Valve Posit	
	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 SIPP	
	10030110535830921	10	3/1/2010 10:53:58 AM	MP238_VLV-DRA_INJ_2_R.almInvalid	MP238_VLV-DRA_INJ_2_R.almInvalid	Valve Posit	
	10030110535730920	9	3/1/2010 10:53:57 AM	MP238_VLV-DRA_INJ_2_R.almCommWarn	MP238_VLV-DRA_INJ_2_R.almCommWarn	Valve Posit	
	10030110535630914	10	3/1/2010 10:53:56 AM	MP238_VLV-DRA_INJ_1_R.almInvalid	MP238_VLV-DRA_INJ_1_R.almInvalid	Valve Posit	
	10030110534730955	9	3/1/2010 10:53:47 AM	MP238_VLV-DRA_TNK31_OUT_R.almCommWarn	MP238_VLV-DRA_TNK31_OUT_R.almPhaseErr	Communica	
	10030110232230962	9	3/1/2010 10:23:22 AM	MP238_VLV-DRA_TNK31_REC_R.almCommWarn	MP238_VLV-DRA_TNK31_REC_R.almPhaseErr	Communica	
	10030110231930949	10	3/1/2010 10:23:19 AM	MP238_VLV-DRA_TNK31_IN_R.almInvalid	MP238_VLV-DRA_TNK31_IN_R.almInvalid	Valve Posit	
	10030110231830948	9	3/1/2010 10:23:18 AM	MP238_VLV-DRA_TNK31_IN_R.almCommWarn	MP238_VLV-DRA_TNK31_IN_R.almInvalid	Communica	
	10030110231830976	9	3/1/2010 10:23:18 AM	MP238_VLV-DRA_TNK32_OUT_R.almCommWarn	MP238_VLV-DRA_PMP_B_OUT_R.almPhaseErr	Communica	
	10030110230930956	10	3/1/2010 10:23:09 AM	MP238_VLV-DRA_TNK31_OUT_R.almInvalid	MP238_VLV-DRA_TNK31_OUT_R.almInvalid	Valve Posit	

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 Ackno

Reset Search Export

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
	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.almFlt	PS04_TT-HALLWAY4_R.almFlt	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.almFlt	PS04_PT-RECEIVER_BR.almFlt	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
	10020208102838122	8	2/2/2010 8:10:28 AM	PS04_TT-HALLWAY4_R.almFlt	PS04_TT-HALLWAY4_R.almFlt	Maint Serv

Backlight View

User: ALYESKA\fc8625

Rows:48



## Search Criteria

### Time Filter

Start Date: 1/31/2010 15  
Start Time: 12:00 AM  
End Date: 3/2/2010 15  
End Time: 11:54 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

	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
	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

AlarmViewer\_3\_2\_2010[1] - Microsoft Excel

A1	Event ID								
1	Event ID	Time Stamp	Priority	Alarm Tag	Description	Alarm Type	PI Tag	MTL Tag	MEL Tag
2	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
3	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
4	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
5	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
6									
7									

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 SIPP
	10030109504342616	8	3/1/2010 9:50:43 AM	PS09_SIPPS-HEALTH_R_B.almAI2	PS09_SIPPS-HEALTH_R_B.almAI2	PS-09 SIPP
	10022823122639897	8	2/28/2010 11:12:26	PMP07_RGV_COMM-69AR.almCommA	PS07_RGV_COMM-69AR.almCommA	RGV-069A
	10022816340035546	8	3/28/2010 4:34:00 PM	PS04_BT-DECEIVED_BB.almFlt	PS04_BT-DECEIVED_BB.almFlt	PS-04 BB

☐ Backlight View

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

<div> <div>Acknowledge Alarm</div> <div>Block Alarm</div> <div>Submit Work Request</div> <div>Save State</div> <div>Export/Print</div> <div>View in EMIS</div> <div>Trend</div> <div>Schedule Report</div> <div>MTBF</div> </div>						
	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.TnkBlinkGasOutOfRangeAlm	PS01_TVP-DISCH_ANALOGS.TnkBlinkGasOutOfRangeAlm	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	T-DRA_INJ_R.almCommFlt	T-DRA_INJ_R.almCommFlt	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 Su
	10030111083330640	9	3/1/2010 11:08:33 AM	T-DRA_BLDG_R.almHAlarm	T-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.almFlt	PS04_PT-RECEIVER_BR.almFlt	PS-04 Prs
	10022815100028341	10	2/28/2010 3:10:00 PM	PS04_VLV_D1B.almCommWarn	PS04_VLV_D1B.almCommWarn	PS-04 D1B

### Send Work Request Email

To: chris.wiseman@alyeska.com  
 From: nick.wiley@casne.com  
☒ CC Submitter  
 Subject: Work Order Request: 39-P-3304R  
 Body:
 

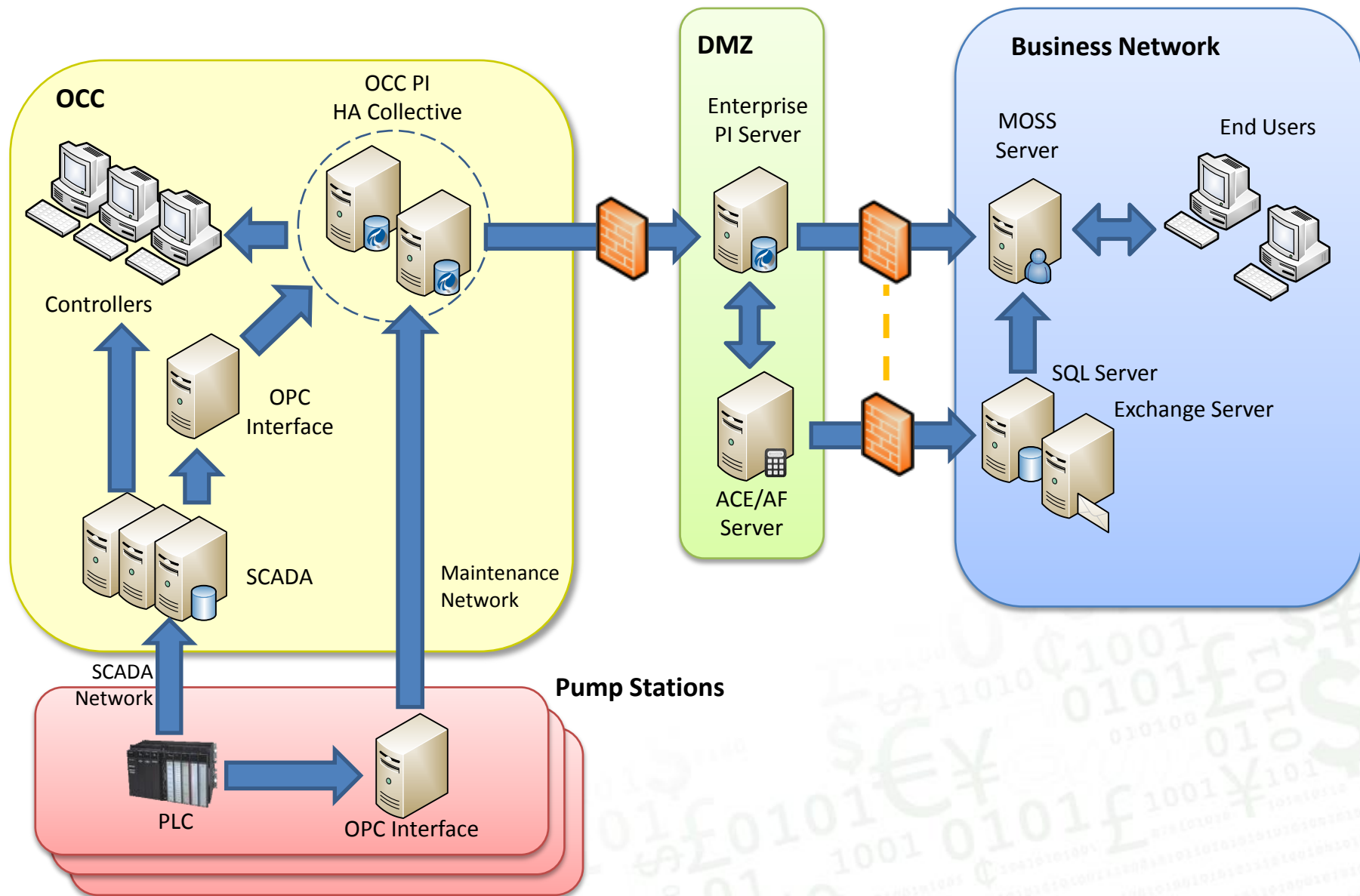
Need Date: 3/2/2010 12:00:00 AM  
 Description: PS-09 MLU-3 Lube Oil Pmp #1 - E3+ in a Warning Condition [39-P-3304R]  
 Unit: PS09  
 OPS System:  
 MTL Tag: 39-P-3304R  
 Priority: 3  
 Discipline: (E)lectrical  
 Comments: This needs to be done ASAP.  
 Requestor Name: ALYESKA\fc8625

Click: <A href='http://dev-dxc:5450/RtWebPartResources/adhochtrendurl.aspx?startTime=2/28/2010 12:00 AM&EndTime=3/2/2010 11:27 AM&Data=\\dev-pdh\PS09\_MLU\_3\_PMP-LUBE\_OIL1\_R.almWarn'>here</A> to view Trend












Submit Cancel

User: ALYESKA\fc8625

Rows: 59

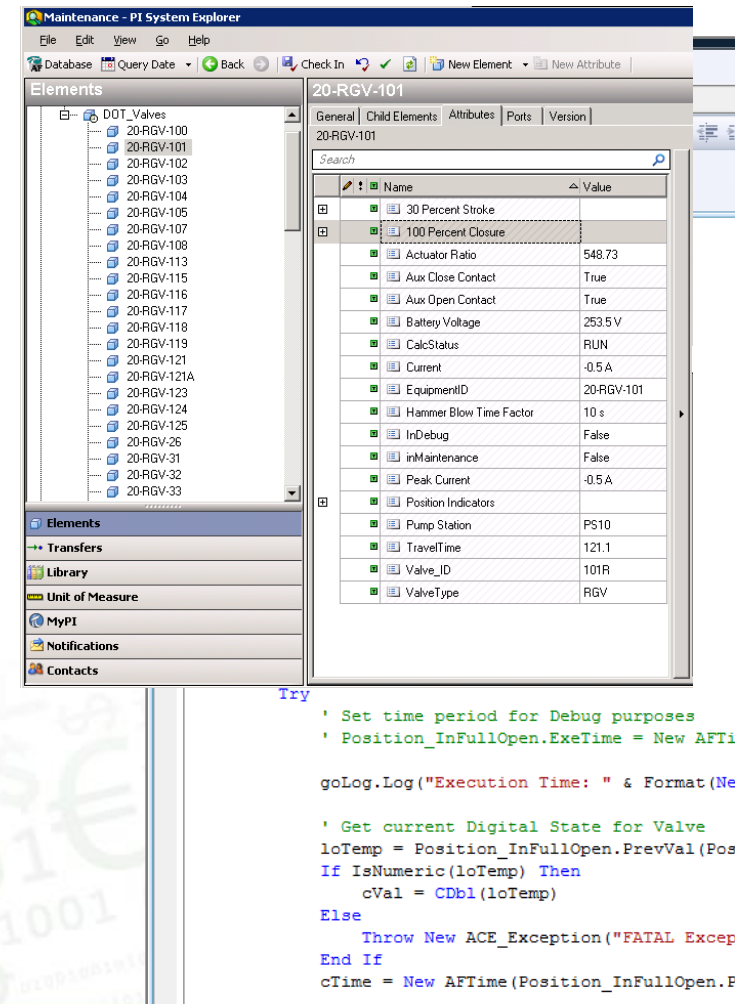


# Software Solution Stack

System Need	Solution	
Real-time Data Storage	<b>PI Enterprise Server</b>	
Relational/Transaction Data Storage	Microsoft SQL Server 2005	
System Modeling	<b>Analysis Framework 2.0 (AF)</b>	
Computations	<b>Advanced Computing Engine</b> Casne .NET Code Assemblies	 
Alarm & Event Notifications	<b>Analysis Framework 2.0, PI Notifications</b> Casne Web Services Outlook & Microsoft Exchange Server	  
User Interaction	<b>PI WebParts</b> Casne WebParts Microsoft Office SharePoint Server (MOSS) 2007	  

# 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





# 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

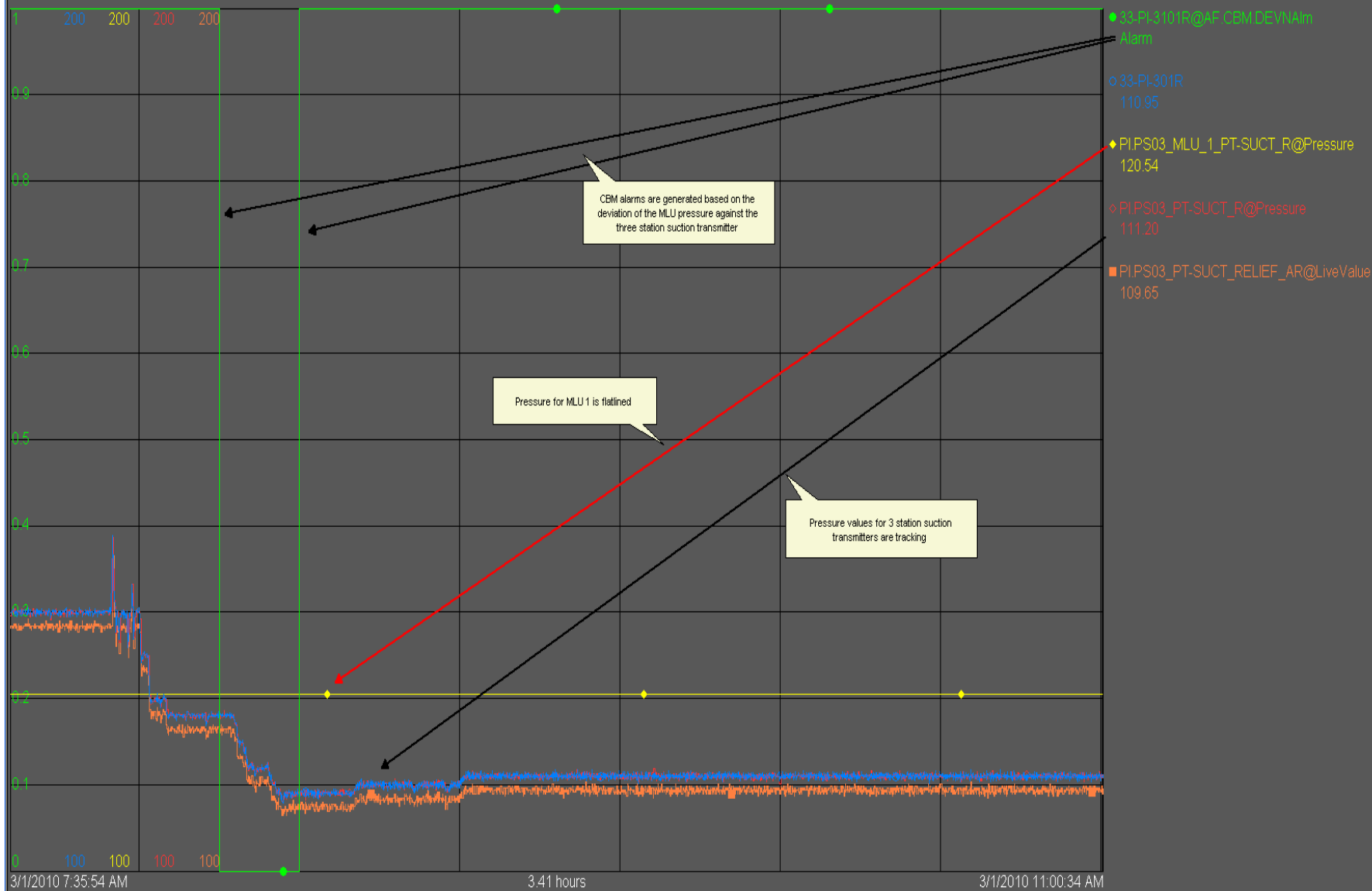


# RESULTS

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

Plot-0



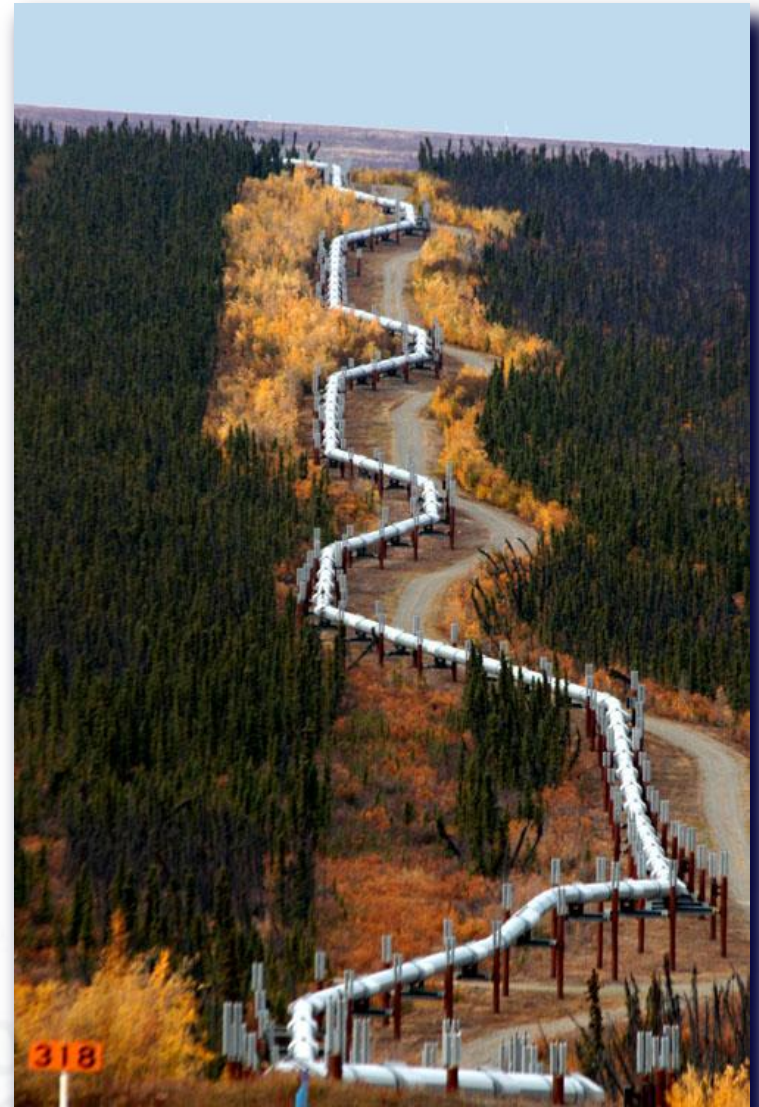
# TANGIBLE BENEFITS

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
<b>FIRST YEAR ANNUAL SAVINGS</b>	<b>\$1,085,000</b>



# 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



# For More Information



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Maintenance Program Lead  
SR Transition Team



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