Turning **insight** into **action**.

OSIsoft. USERS CONFERENCE 2011

Reducing Control Room Alarm Loads & Increasing Equipment Availability

Presented by **Darryl Hammond**
MIST & Associates

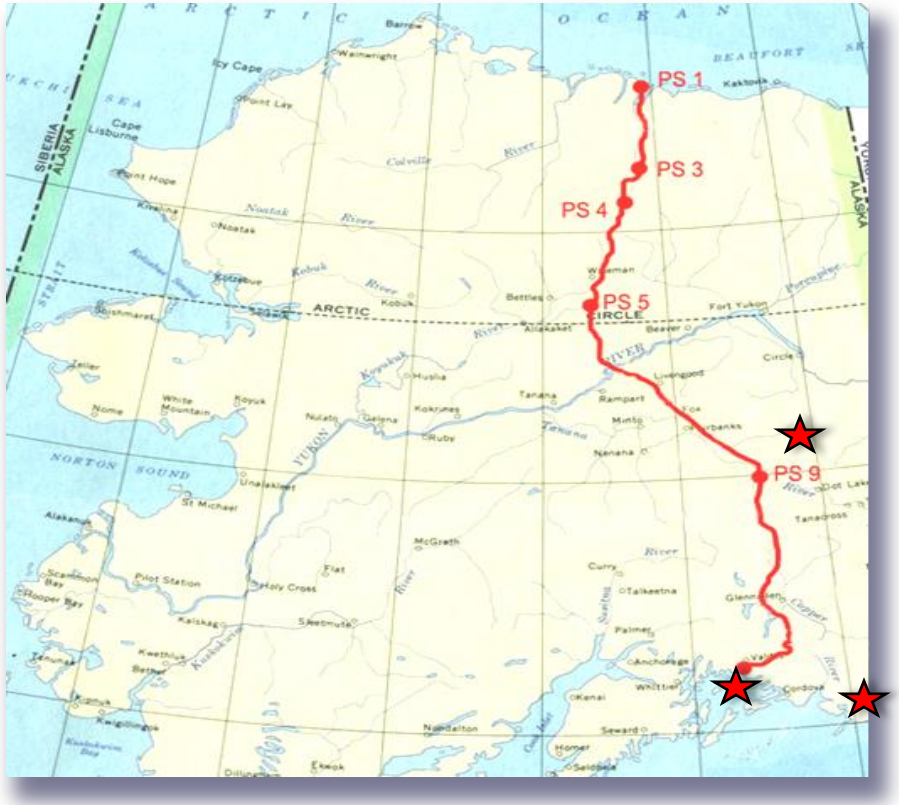
Integration of Operations, Maintenance & Engineering

Darryl Hammond
MIST & Associates

AGENDA

- Introductions
- Background: Mission, Goals and Challenges
- Integrating Alarm Management & RCM2
- Maintenance & Diagnostics Center
- Case Studies
- Results

ABOUT MIST & Associates



MIST
Maintenance Integrated Strategies & Technology

Over 30 Years in the Oil Industry

- Alyeska Pipeline - *Maintenance Program Lead*
- Enserch Corporation - *GF*
- Earthmovers of Alaska - *Maintenance Supervisor*

Background

Mission

- Address non-operational alarms
- Address New Amendments to 49 CFR Parts
- 192 and 195.4
- Ensure pipeline reliability and integrity using advanced maintenance strategies

Goals

- Proactive vs. reactive maintenance
- Optimize available resources
- Discover better ways to operate and maintain

Background

Challenges

- Difficult operating environment
- Complexities of modernization
- Increasing scrutiny and regulation
- Organization Silos
- Attrition of SME's

Documentation and Rationalization

- **Recommended practice for alarm management**
- **Process that identifies:**
  - Cause of Alarm
  - Time to Respond
  - Typical Response
  - Consequence of going unacknowledged
- **Determines Alarm priority – Who gets it!**
  - Operations Alarm (critical, high, medium, low)
  - Maintenance/Engineering Alarm (high, medium, low)

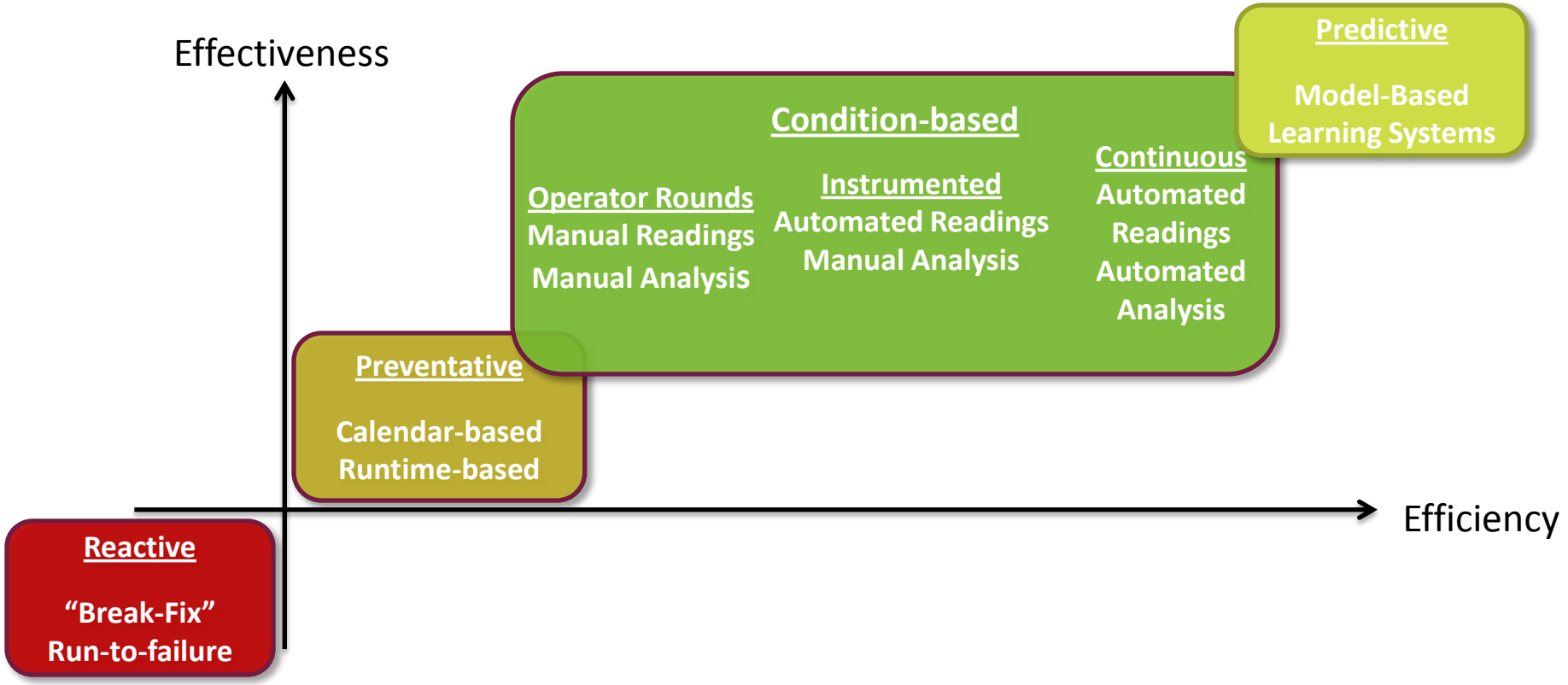
Essentially documenting and justifying why you need each alarm and who should respond to it

RCM2 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



Alarm Management & RCM2 Integration Questions

- Why Do This at All?
- There managed in different departments
- Our system isn't Broken, Why Fix it?
- Engineering typically does not Work on this?

Here’s Why…

49 CFR Parts 192 and 195.4

The regulation contains specific requirements

for operators to design & operate their enterprise-wide SCADA

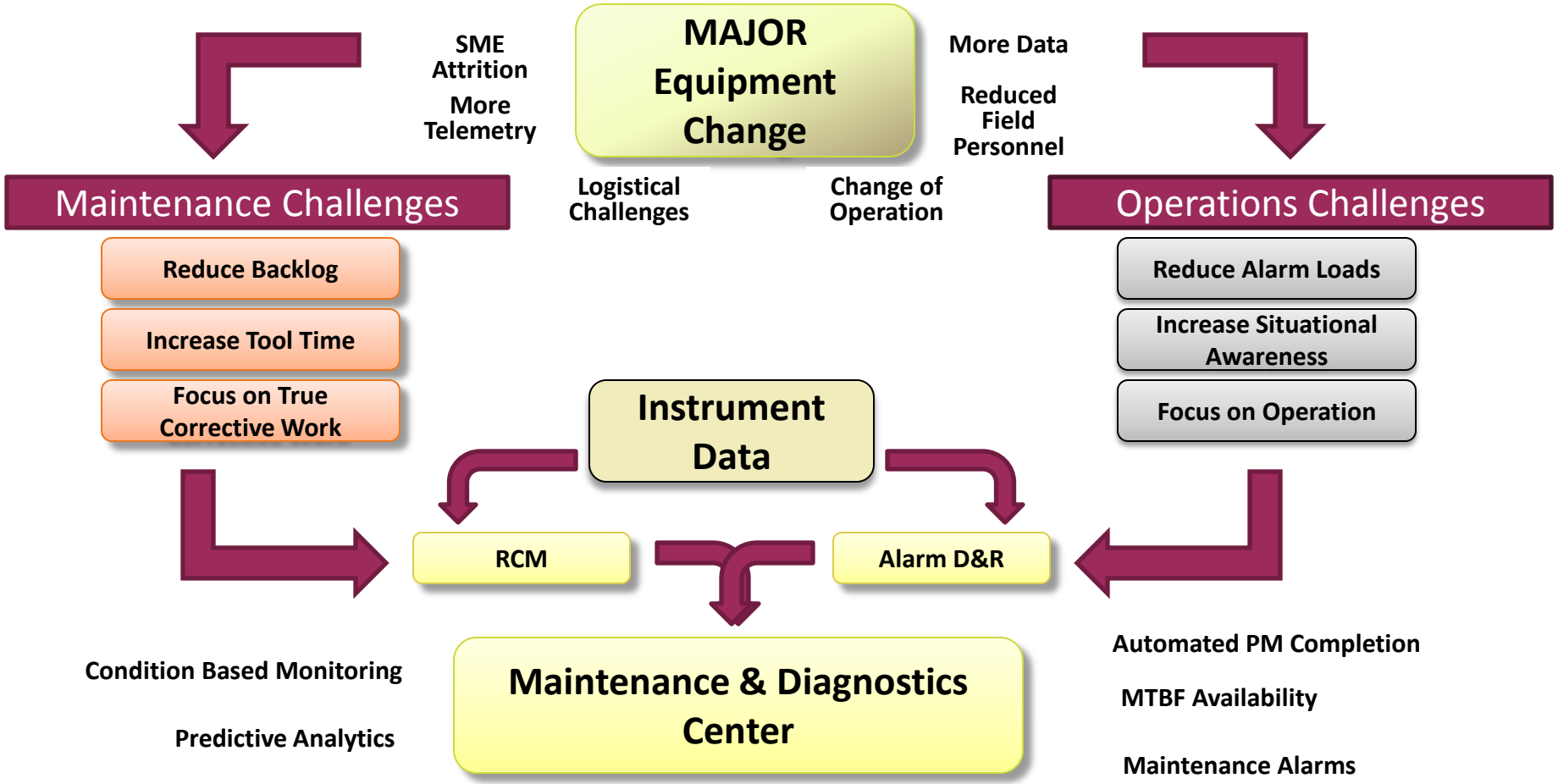
System to take into account what is needed by the controller to

properly do the job of keeping things Operating Safely &

Responsibly

49 CFR Parts 192 and 195.4

- Roles & Responsibilities
- Provide Adequate Information
- Fatigue Mitigation
- Alarm Management
- Change Management
- Operating Experience
- Training
- Compliance Validation
- Compliance & Deviation


MAJOR Equipment Change
SME Attrition
More Telemetry
More Data
Reduced Field Personnel
Logistical Challenges
Change of Operation
Maintenance Challenges
Reduce Backlog
Increase Tool Time
Focus on True Corrective Work
Operations Challenges
Reduce Alarm Loads
Increase Situational Awareness
Focus on Operation
Instrument Data
RCM
Alarm D&R
Condition Based Monitoring
Predictive Analytics
Maintenance & Diagnostics Center
Automated PM Completion
MTBF Availability
Maintenance Alarms

D&R Must Factor in Non-Operational Alarms

Table 2. Time to Respond		
Classes for Maximum Time to Respond	**Personnel Action**	
< 2 minutes	Immediate Operations Action	
2 to 10 minutes	Rapid Operations Action	
10 to 30 minutes	Prompt Operations Action	OAV
30 minutes to 12 hours	Immediate Maintenance Action	MMV
12 hours to 24 hours	Rapid Maintenance Action	
24 hours to 7 days	Prompt Maintenance Action	
7 to 14 days	Prompt Maintenance Action	MMV
> 14 days	Normal Work Management	Other
Never	No Action	

Fallout

This is a Paradigm shift for many companies…

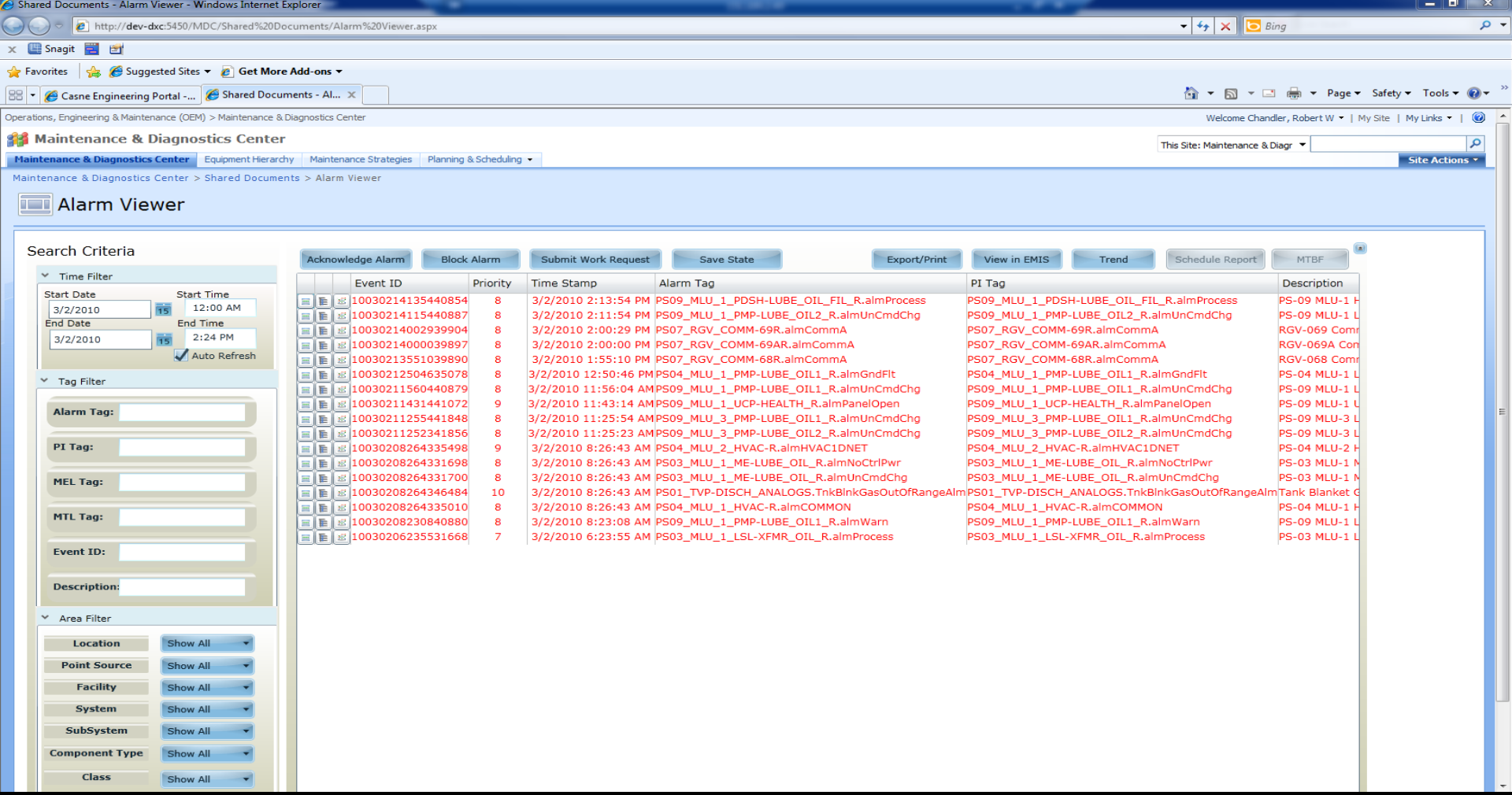
- Instead of controllers spending most of their time responding to all alarms, they can focus on the operation and be better prepared to respond to Alarms, look for improvements, efficiencies, etc.
- **With information going to the right people, they are taking that information and evolving the business**
- Moving from an alarm database to an information database
- **Converging events with historical data to drive improvements**

Solution

- Utilization of non-operational alarms parsed out during D&R and RCM
- Leveraging telemetry to evolve O&M strategies resulting in major reductions in work loads and bottom line cost savings
- Joint effort between Operations, Maintenance, SCADA and Engineering personnel

Solution Stack

System Need	Solution
Real-time Data Storage	**PI Enterprise Server**
Relational/Transaction Data Storage	Microsoft SQL Server 2005
System Modeling	**Analysis Framework 2.0 (AF)**
Computations	**Advanced Computing Engine** .NET Code Assemblies
Alarm & Event Notifications	**Analysis Framework 2.0, PI Notifications** Outlook & Microsoft Exchange Server
Mobile Device Enablement	**Transpara Visual KPI v.4.0**
User Interaction	**PI WebParts**, Custom WebParts & Microsoft Office SharePoint Server (MOSS) 2007
Predictive Modeling	**Smart Signal Sentinel, Workbench**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Favorites
Suggested Sites
Get More Add-ons
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Shared Documents - Al...
Operations, Engineering & Maintenance (OEM) > Maintenance & Diagnostics Center
Welcome Chandler, Robert W | My Site | My Links
Maintenance & Diagnostics Center
Maintenance & Diagnostics Center
Equipment Hierarchy
Maintenance Strategies
Planning & Scheduling
This Site: Maintenance & Diagr
Site Actions
Maintenance & Diagnostics Center > Shared Documents > Alarm Viewer
Alarm Viewer
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MEL Tag:
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Point Source
Facility
System
SubSystem
Component Type
Class
Show All
Acknowledge Alarm
Block Alarm
Submit Work Request
Save State
Export/Print
View in EMIS
Trend
Schedule Report
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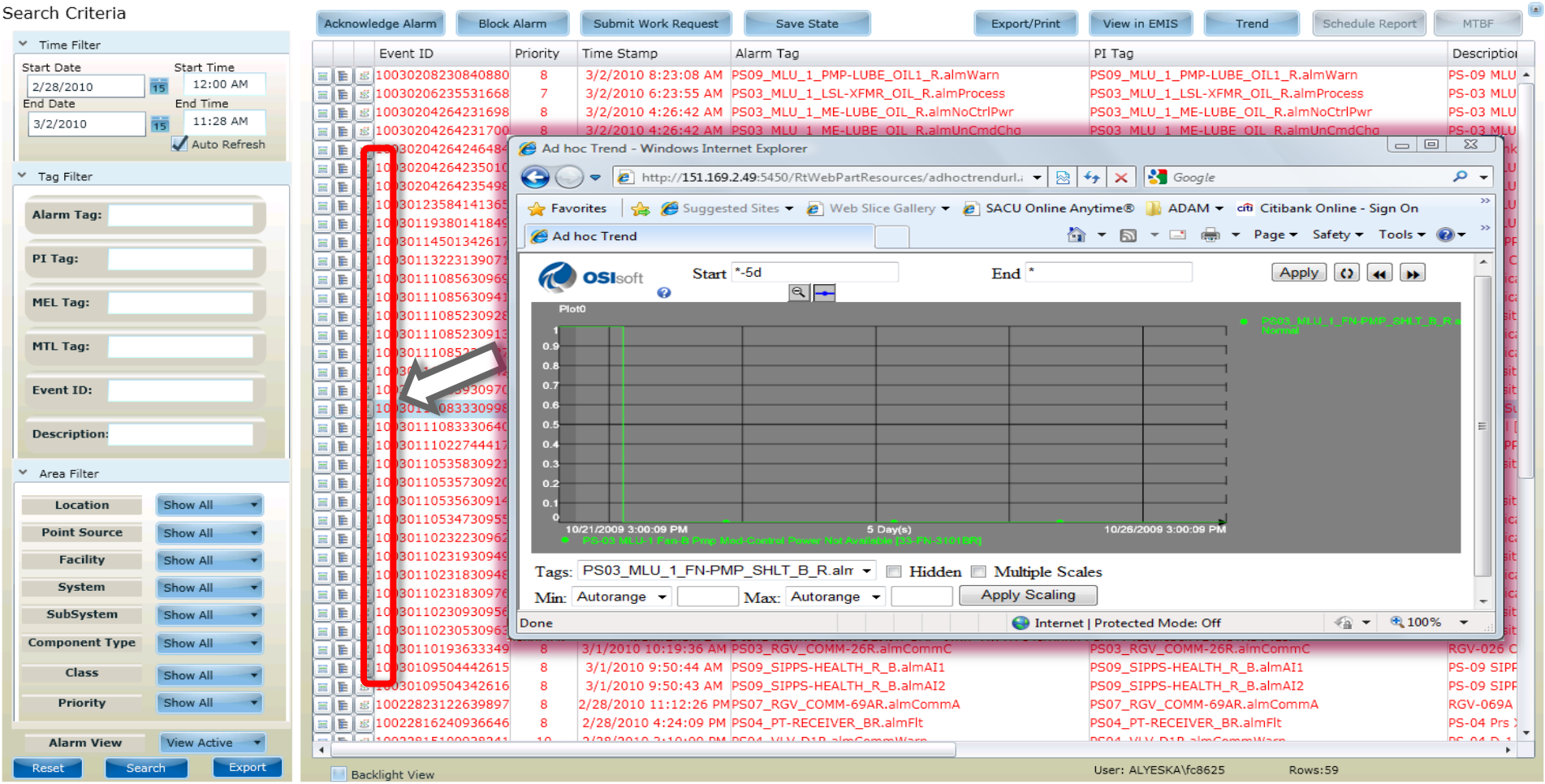
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End *
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Auto Refresh

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PI Tag:

MEL Tag:

MTL Tag:

Event ID:

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Area Filter

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Facility: Show All

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SubSystem: Show All

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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

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Backlight View

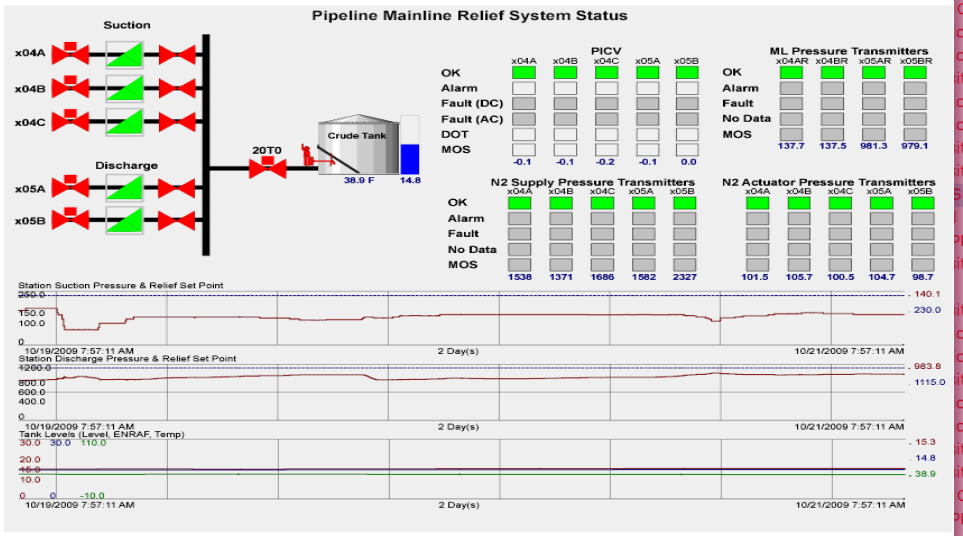
User: ALYESKA\fc8625 Rows:59

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



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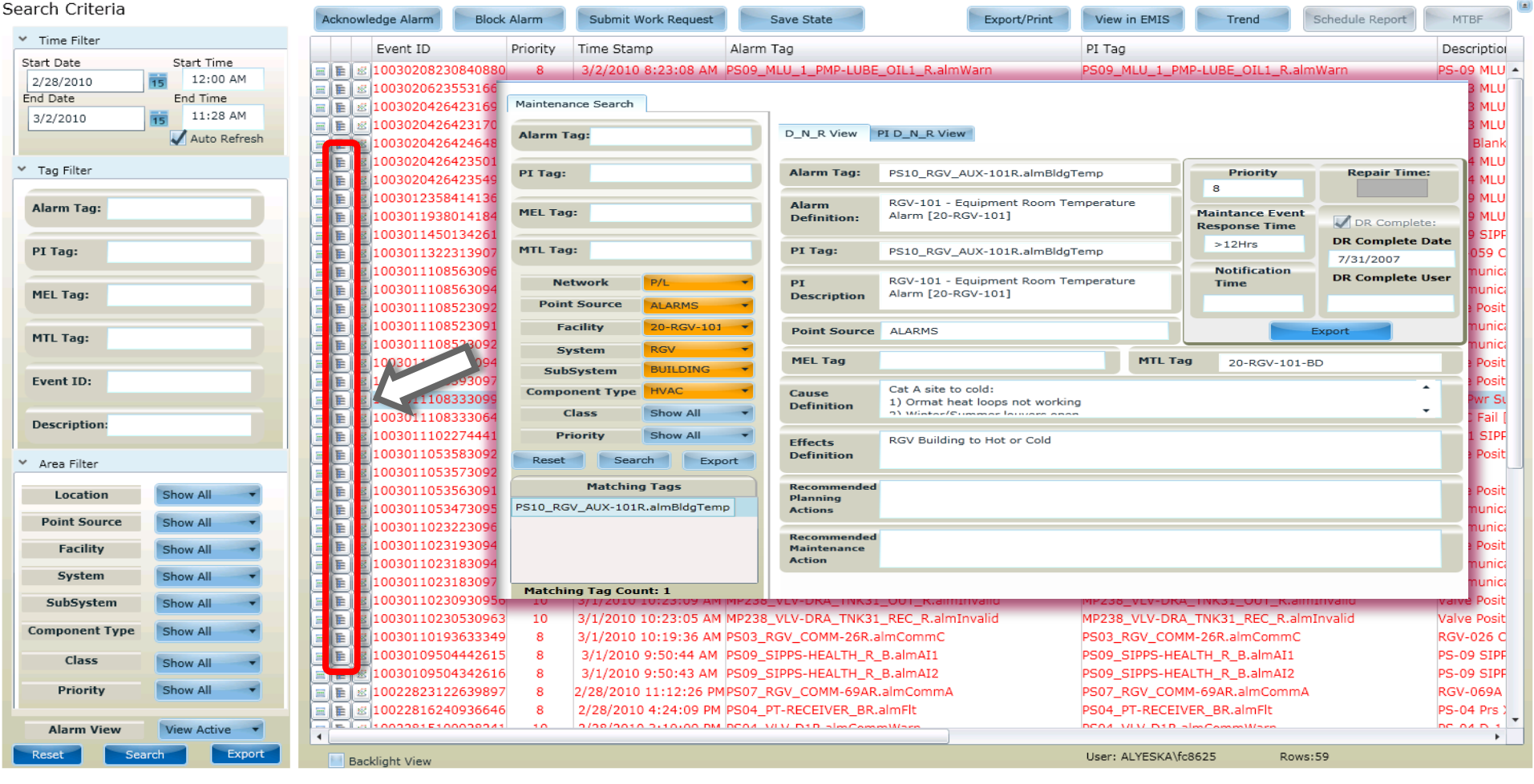


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MEL Tag:
MTL Tag:
Event ID:
Description:
Area Filter
Location
Point Source
Facility
System
SubSystem
Show All
Acknowledge Alarm
Block Alarm
Submit Work Request
Save State
Export/Print
View in EMIS
Trend
Schedule Report
MTBF
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Priority
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Pig Passage
Block Alarm
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Search Criteria

Time Filter

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End Date: 3/2/2010 — End Time: 11:48 AM

☑ Auto Refresh

Tag Filter

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- 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

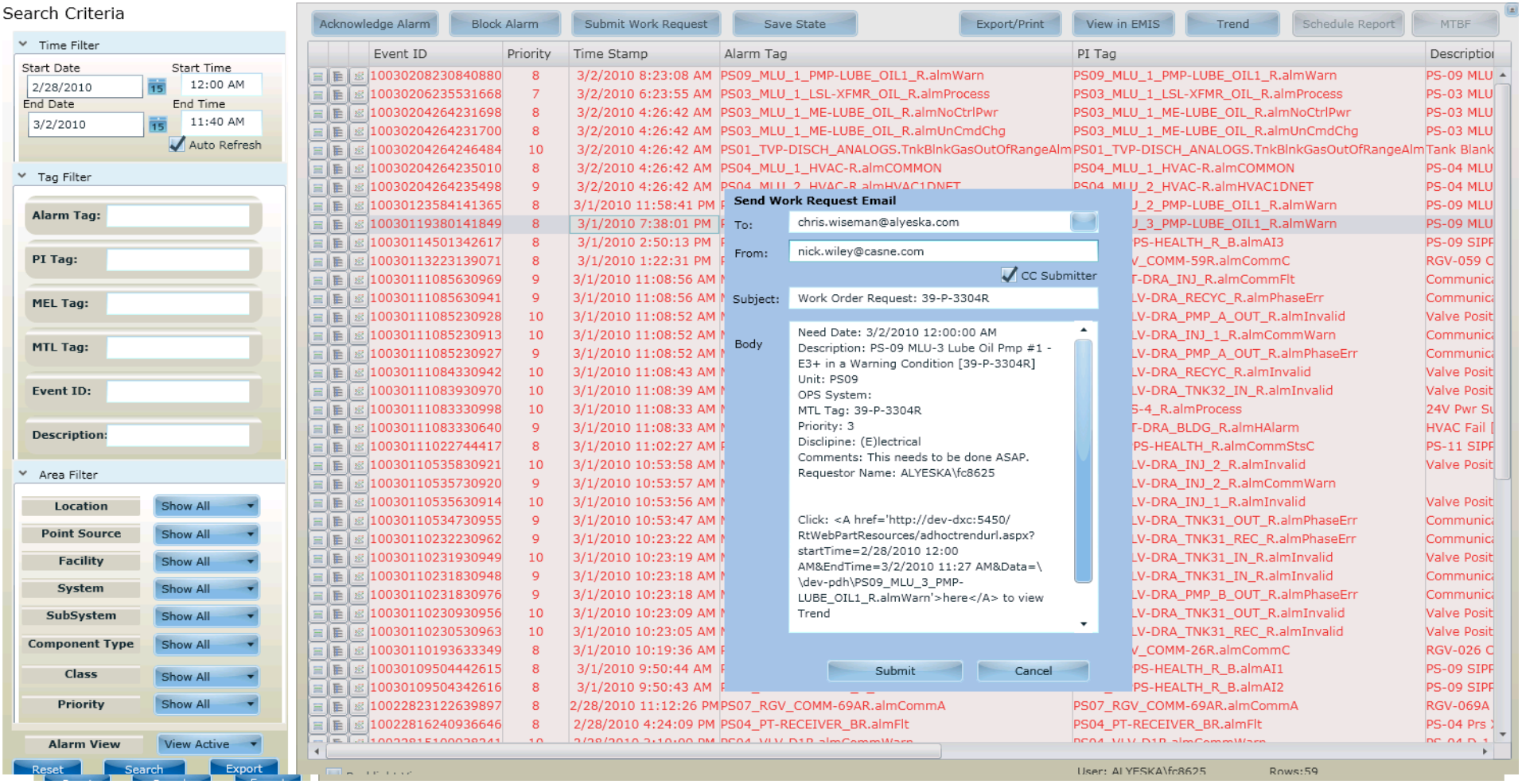
Reset — Search — Export

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	Descriptio
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 Commentfaults 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 ala
10020804133247013	9	2/8/2010 4:13:32 AM	PS09_BST_PMP-1.AlarmAlm	PS09_BST_PMP-1.AlarmAlm	Pump in ala
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	Communica
10020614115930934	9	2/6/2010 2:11:59 PM	MP238_VLV-DRA_PMP_B_OUT_R.almCommWarn	MP238_VLV-DRA_INJ_2_R.almPhaseErr	Communica
10020208102831014	8	2/2/2010 8:10:28 AM	PS01_LAN-01_R.almMaintSrvWanA	PS01_LAN-01_R.almMaintSrvWanA	Maint Serv

Backlight View — User: ALYESKA\fc8625 — Rows:48

Search Criteria



Transpara Upstream - Windows Internet Explorer

http://demo.transpara.com/upstream/map.aspx?view=8b67895e-5fa6-4f29-955e-eeb274839e9b&sc=All

Favorites | Transpara Visual KPI | Transpara Upstream

VisualKPI

Transpara
as of 3/25/2011 3:55:56 PM

Home | Drilling | All Scorecards

Scorecard	KPI	→	Actual	Target
Well 1 - Ops	ROP (ft/hr)	↑	17.58	12

Mud Wt 14.41	VIS (sec/q) 10.76	YP/MBT 39/6.2	WL/FC 4/1/32	PH 10.86
TVD (ft) 6,200	TMD (ft) 7,450	Days 27.14	CL 16.19	Gels 8/14/16
Total Cost ($M) 9,500	Daily Cost ($M) 233.6	ROP (ft/hr) 17.58	WOB 16.06	Formation Eocene
Flow (gpm) 481.8	SPP 2,989	RPM 152.1	Last Casing (in) 9.6	Bit Size (in) 8.5
Depth (ft) 10,200	HC Shows Yes	String T Mer	RealTest 678	PropertyTest Aberdeen

Scorecard: Well 1 - Ops
KPI: RPM
Top Text: RPM
Bottom Text: 152.1
Status: High High
Target: 100
Actual: 152.1

javascript:ShowKPI('true','1341','8b67895e-5fa6-4f29-955e-eeb274839e9b','false','c9c19a33-6694-48e9-8810-3b6bea7d3647','Well 1 -

Internet | Protected Mode: On | 100%

6:57 PM
3/25/2011

Management Issues and Concerns

- **You've created essentially a separate console to handle Maintenance and Engineering alarms:**
  - Additional Staffing
  - Additional Software
  - Additional Support
- **How is any of this cost effective???**
- **Remember…**
  - With information going to the right people, they can take that information and evolve the business
  - Converging telemetry, historical data, and alarms provides the insight for improvements

Here is how its cost effective…

Case Study 1: Automated PMs

DOT Function Tests on Valves

Home - Maintenance & Diagnostics Center - Microsoft Internet Explorer provided by Alyeska

File Edit View Favorites Tools Help

Address http://dev-dxc:5450/MDC/XAPLibrarys/eventtrends.aspx

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

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

Maintenance & Diagnostics Center

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

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

Maintenance & Diagnostics Center > XAPLibrarys > eventtrends

REFRESH TRENDS

Search Criteria

Start Date: 9/13/2010 | Start Time: 12:00 AM

End Date: 9/13/2010 | End Time: 9:33 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

Reset | Search | Export

Queried Events

Maintenance Event ID	EQ Tag	Event Time	Event Description
EV100402140023	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
EV100402140617	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% Str
EV100820084837	20-RGV-101	8/20/2010 8:48:37 AM	RGV 30% Stro
EV100402141208	20-RGV-102	4/2/2010 2:12:08 PM	RGV 30% St
EV100526212230	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
EV100402141827	20-RGV-103	4/2/2010 2:18:27 PM	RGV 30% St
EV100526212204	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
EV100402142453	20-RGV-104	4/2/2010 2:24:53 PM	RGV 30% St
EV100526212243	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
EV100402143058	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 MAINTE
EV100702095735	20-RGV-105	7/2/2010 9:57:35 AM	IN MAINTE

Alarm History: *-30d | Associate Alarms

Equipment Tag: 20-RGV-101 **Actuator Ratio:** 548.73

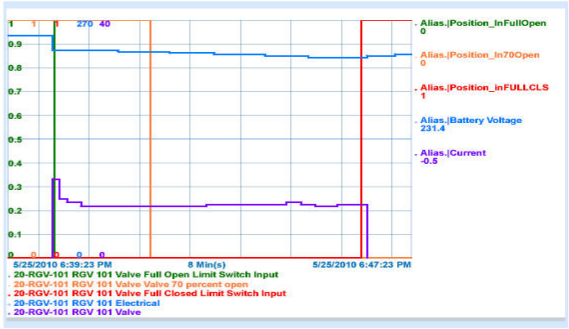
Event Time: 5/26/2010 9:21:38 PM **Event ID:** EV100526212138204 3

Description Travel Time Review : Valve FULL STROKE Valve closing time is 360.00 which is outside of the warning percentage (20%) of the target time 480

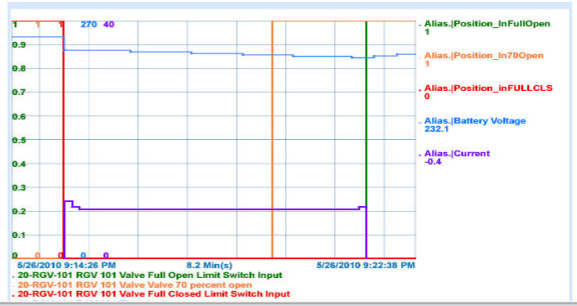
Close Event		Open Event	
Close Time (Min)	384	Open Time (Min)	0
Close Time (Max)	576	Open Time (Max)	0
Close Time (Actual)	360	Open Time (Actual)	372
Close (Start)	5/25/2010 6:40:23 PM	Open (Start)	5/26/2010 9:15:26 PM
Close (End)	5/25/2010 6:46:23 PM	Open (End)	5/26/2010 9:21:38 PM
Current (Peak)	13.30	Current (Peak)	9.70
Current (Average)	8.96	Current (Average)	8.22
Voltage (Average)	232.21	Voltage (Average)	233.30

PRINT EVENT

CLOSE EVENT

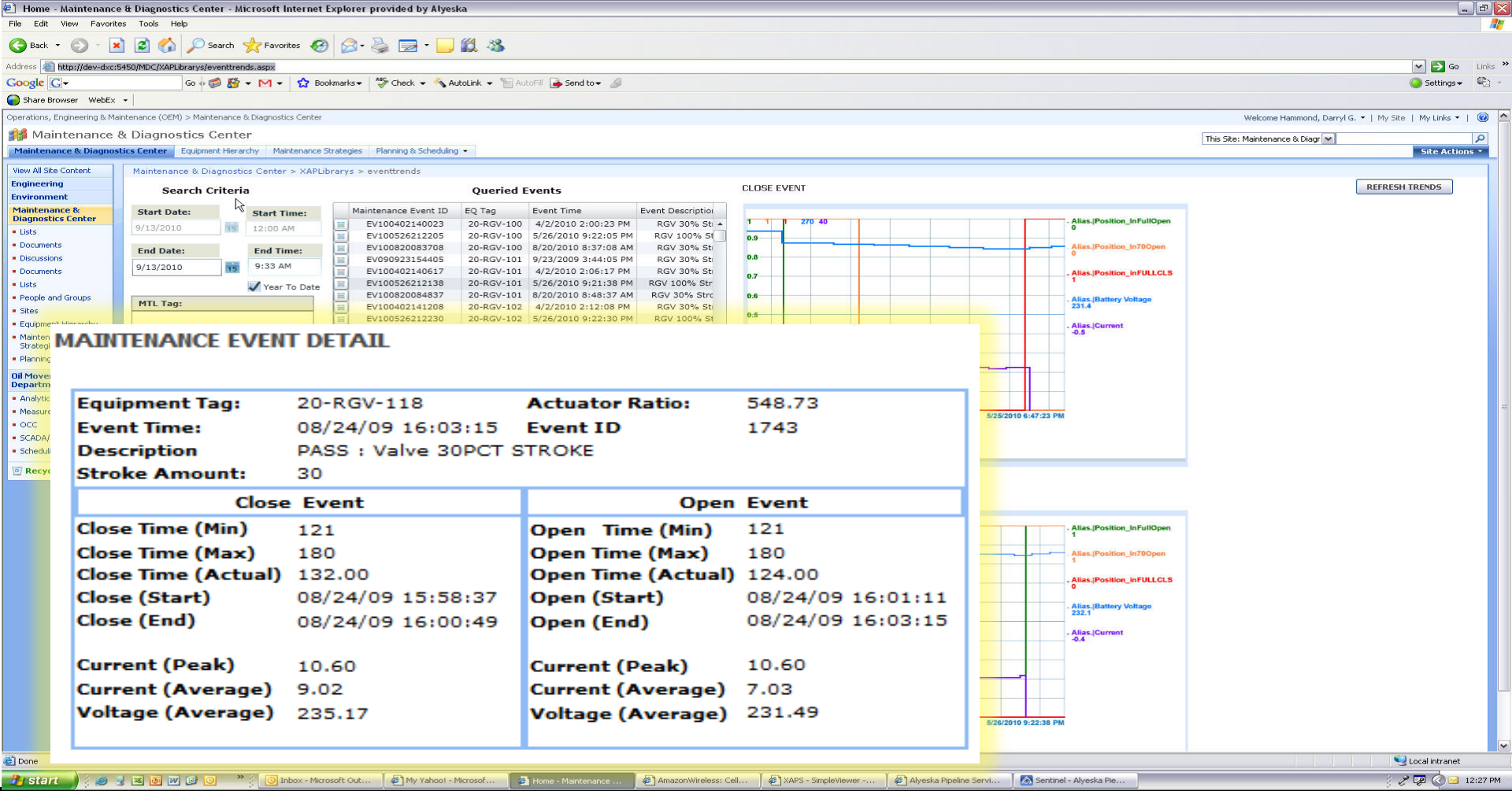


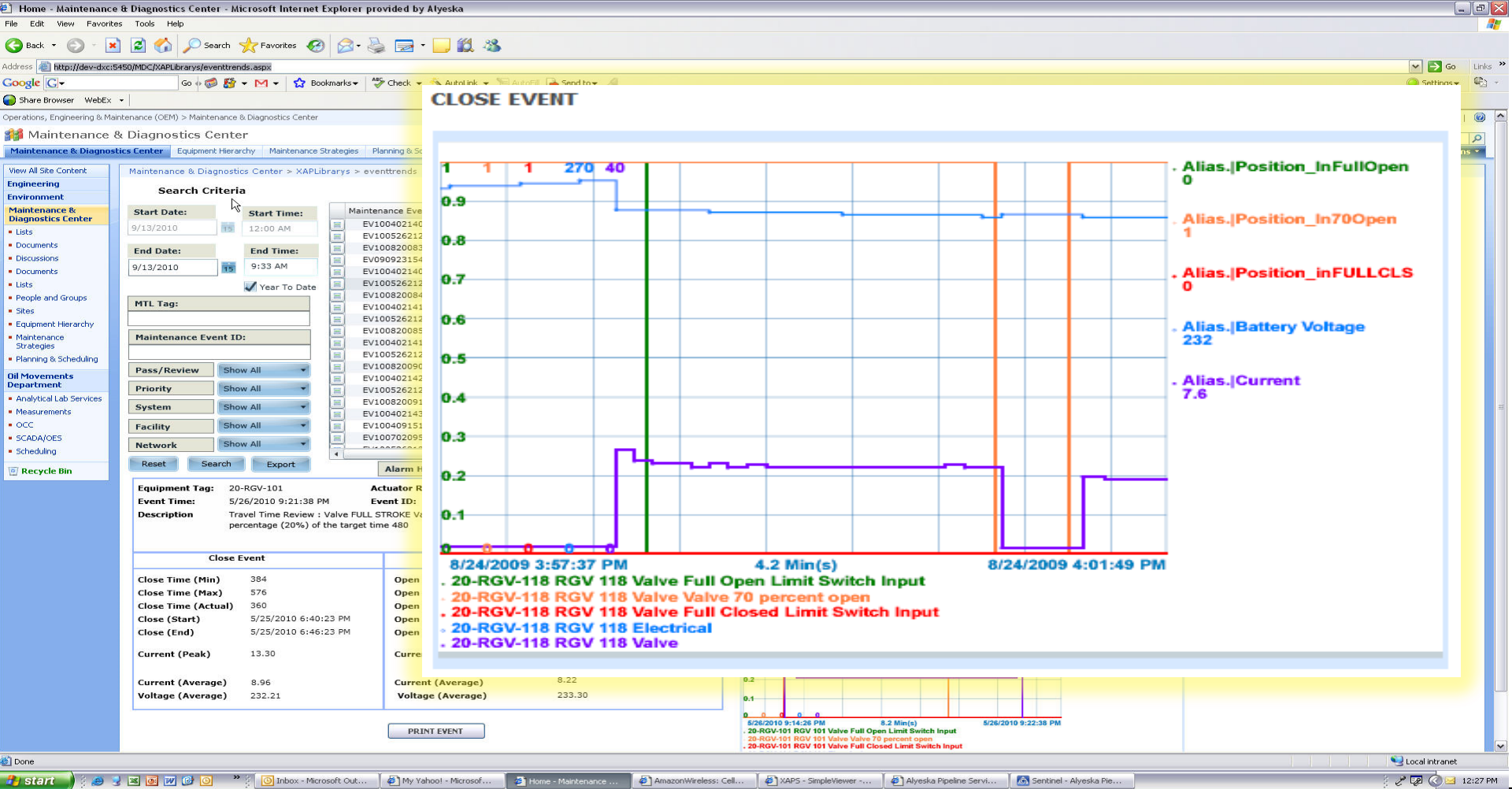
OPEN EVENT

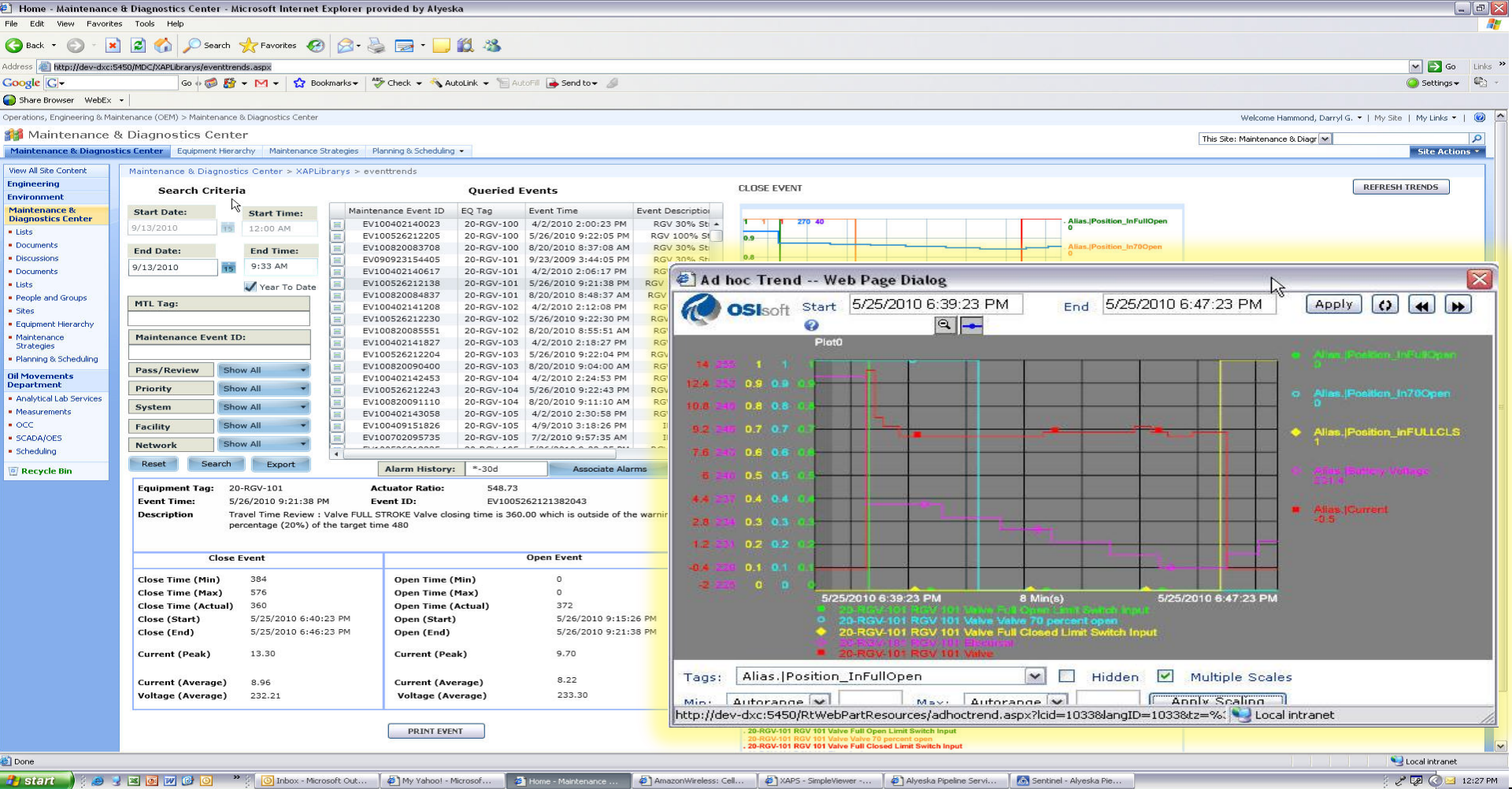


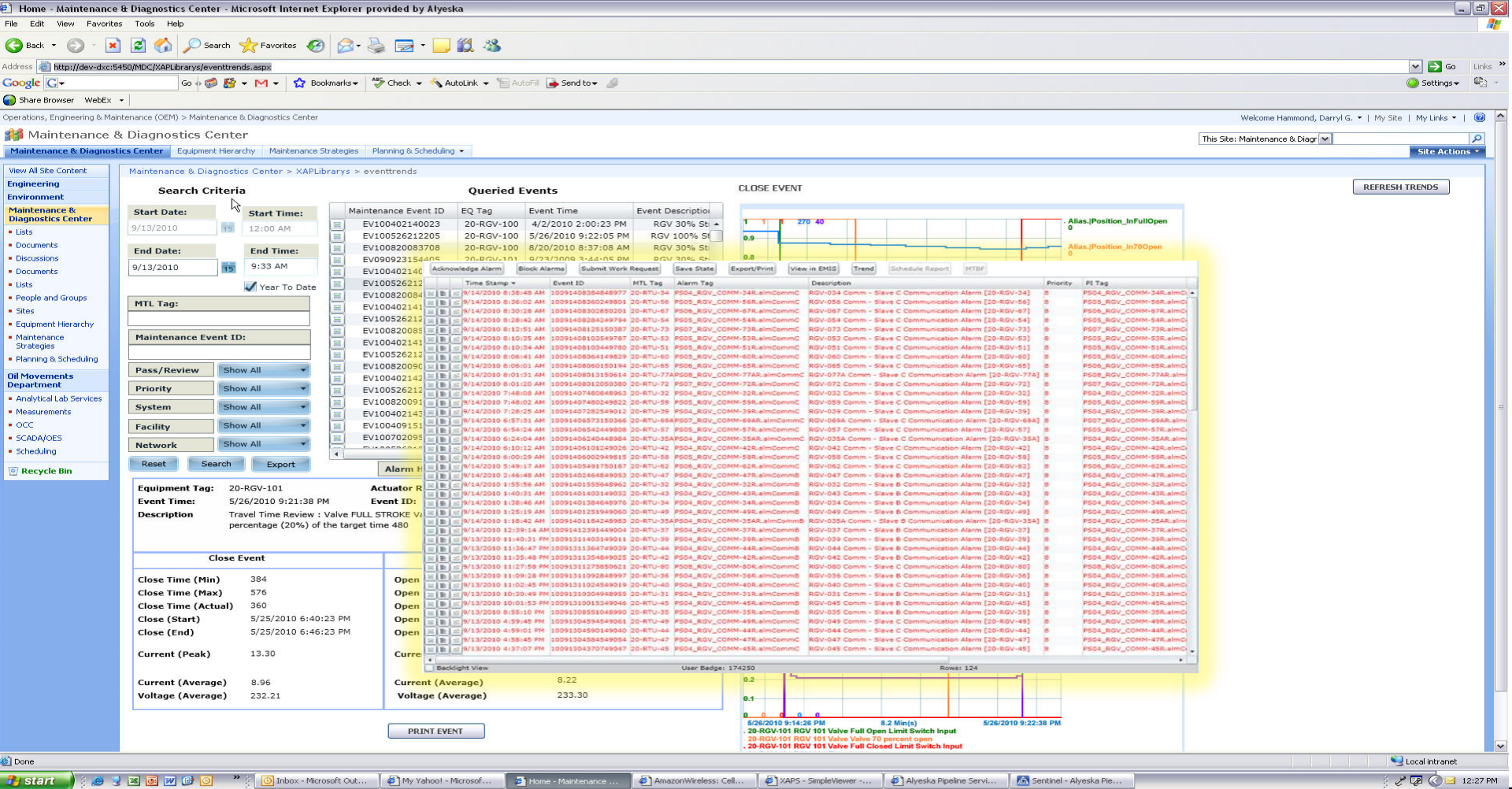
Done | Local intranet

start | Inbox - Microsoft Out... | My Yahoo! - Microsof... | Home - Maintenance ... | AmazonWireless: Cell... | XAPS - SimpleViewer -... | Alyeska Pipeline Servi... | Sentinel - Alyeska Pie... | 12:27 PM


Home - Maintenance & Diagnostics Center - Microsoft Internet Explorer provided by Alyeska
Maintenance & Diagnostics Center
Search Criteria
Queried Events
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
Current (Peak) 10.60
Current (Average) 9.02
Voltage (Average) 235.17
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) 7.03
Voltage (Average) 231.49


Home - Maintenance & Diagnostics Center - Microsoft Internet Explorer provided by Alyeska
CLOSE EVENT
Maintenance & Diagnostics Center
Search Criteria
Start Date:
9/13/2010
Start Time:
12:00 AM
End Date:
9/13/2010
End Time:
9:33 AM
Year To Date
MTL Tag:
Maintenance Event ID:
Pass/Review
Priority
System
Facility
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 FULL STROKE
percentage (20%) of the target time 480
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
PRINT EVENT
1 1 1 270 40
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Alias.|Position_InFullOpen
0
Alias.|Position_In70Open
1
Alias.|Position_inFULLCLS
0
Alias.|Battery Voltage
232
Alias.|Current
7.6
8/24/2009 3:57:37 PM
4.2 Min(s)
8/24/2009 4:01:49 PM
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

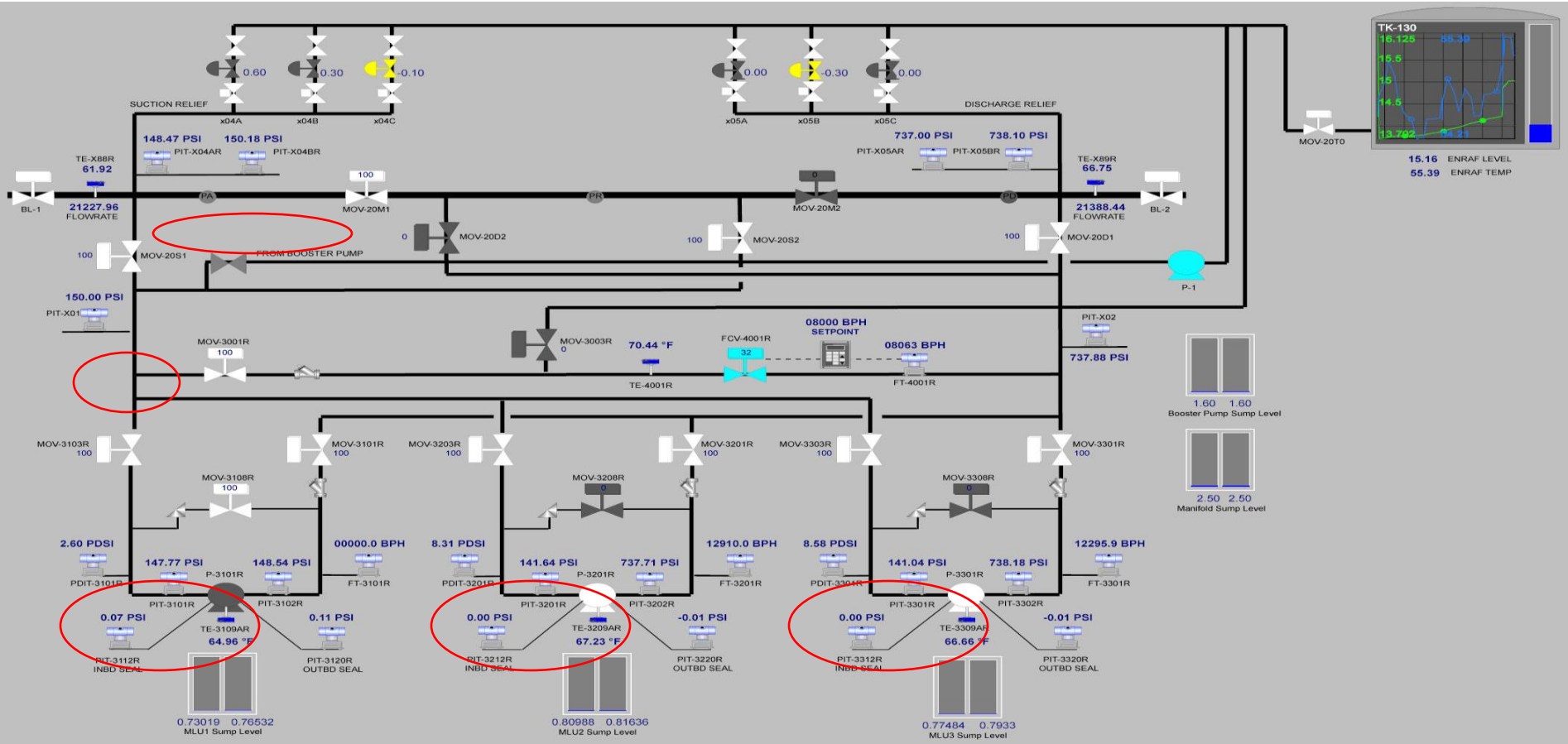

Home - Maintenance & Diagnostics Center - Microsoft Internet Explorer provided by Alyeska
Maintenance & Diagnostics Center
Search Criteria
Queried Events
CLOSE EVENT
REFRESH TRENDS
Ad hoc Trend -- Web Page Dialog
OSIsoft
Start
5/25/2010 6:39:23 PM
End
5/25/2010 6:47:23 PM
Apply
Plot0
8 Min(s)
Tags:
Alias.|Position_InFullOpen
Hidden
Multiple Scales
Apply Scaling
Equipment Tag:
20-RGV-101
Actuator Ratio:
548.73
Event Time:
5/26/2010 9:21:38 PM
Event ID:
EV100526121382043
Description
Close Event
Open Event
PRINT EVENT


Home - Maintenance & Diagnostics Center - Microsoft Internet Explorer provided by Alyeska
Maintenance & Diagnostics Center
Search Criteria
Queried Events
CLOSE EVENT
REFRESH TRENDS
Start Date:
Start Time:
End Date:
End Time:
Year To Date
MTL Tag:
Maintenance Event ID:
Pass/Review
Priority
System
Facility
Network
Reset
Search
Export
Equipment Tag: 20-RGV-101
Event Time: 5/26/2010 9:21:38 PM
Description
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
Current (Average) 8.22
Voltage (Average) 233.30
PRINT EVENT
5/26/2010 9:14:26 PM
8.2 Min(s)
5/26/2010 9:22:38 PM
. 20-RGV-101 RGV 101 Valve Full Open Limit Switch Input
20-RGV-101 RGV 101 Valve Valve 70 percent open
. 20-RGV-101 RGV 101 Valve Full Closed Limit Switch Input

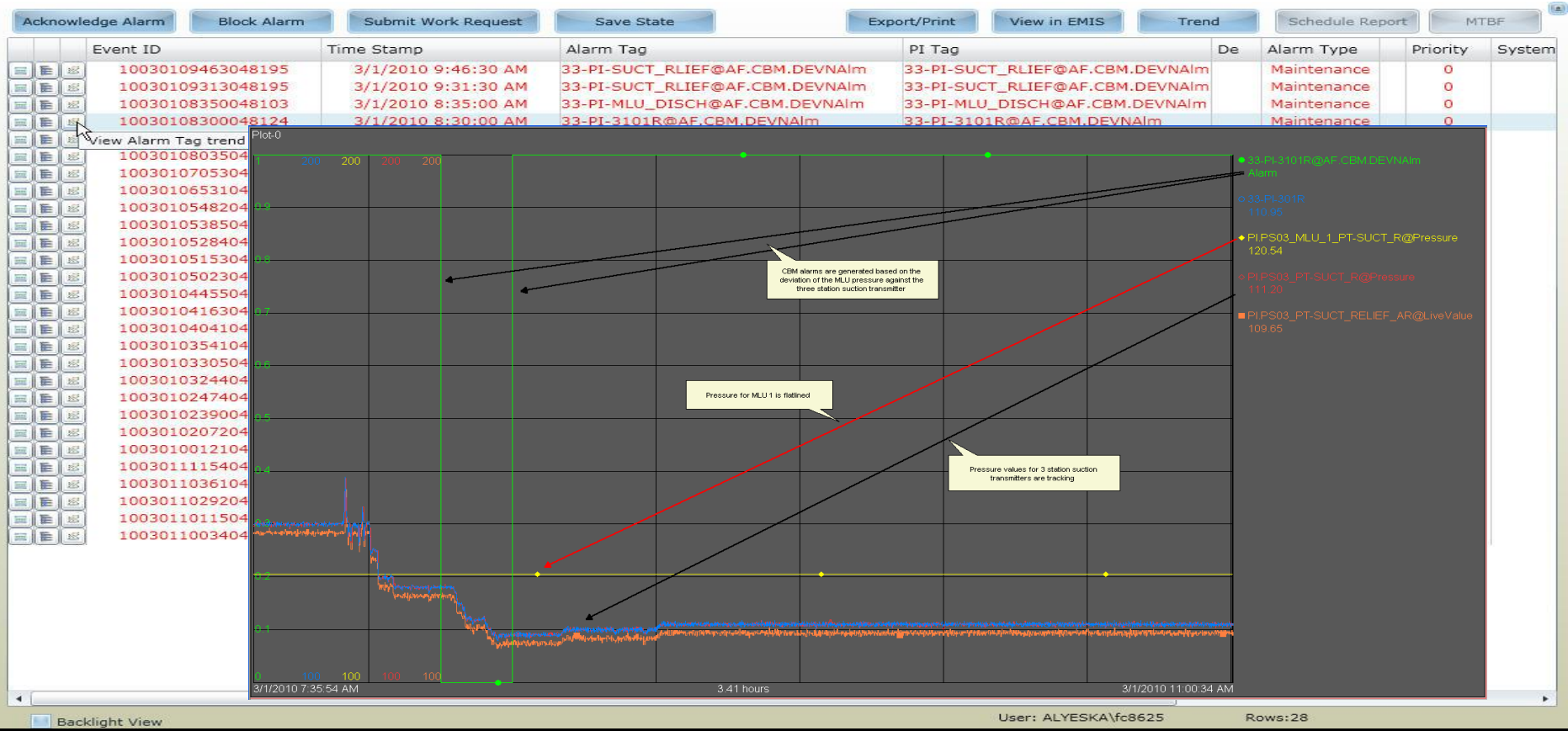
Case Study 2 Condition Based Monitoring

- Comparing pressure transmitters on pump suction, station suction, and suction relief line – 4 transmitters in total.
- Alarm based on a deviation of 5 psi for greater than 5 minutes
- Continuously monitored 24/7
- This approach can be implemented on all like devices monitoring similar analog values.

Diagnostics HMI: Station Overview



M&DC HMI: CBM Alarms



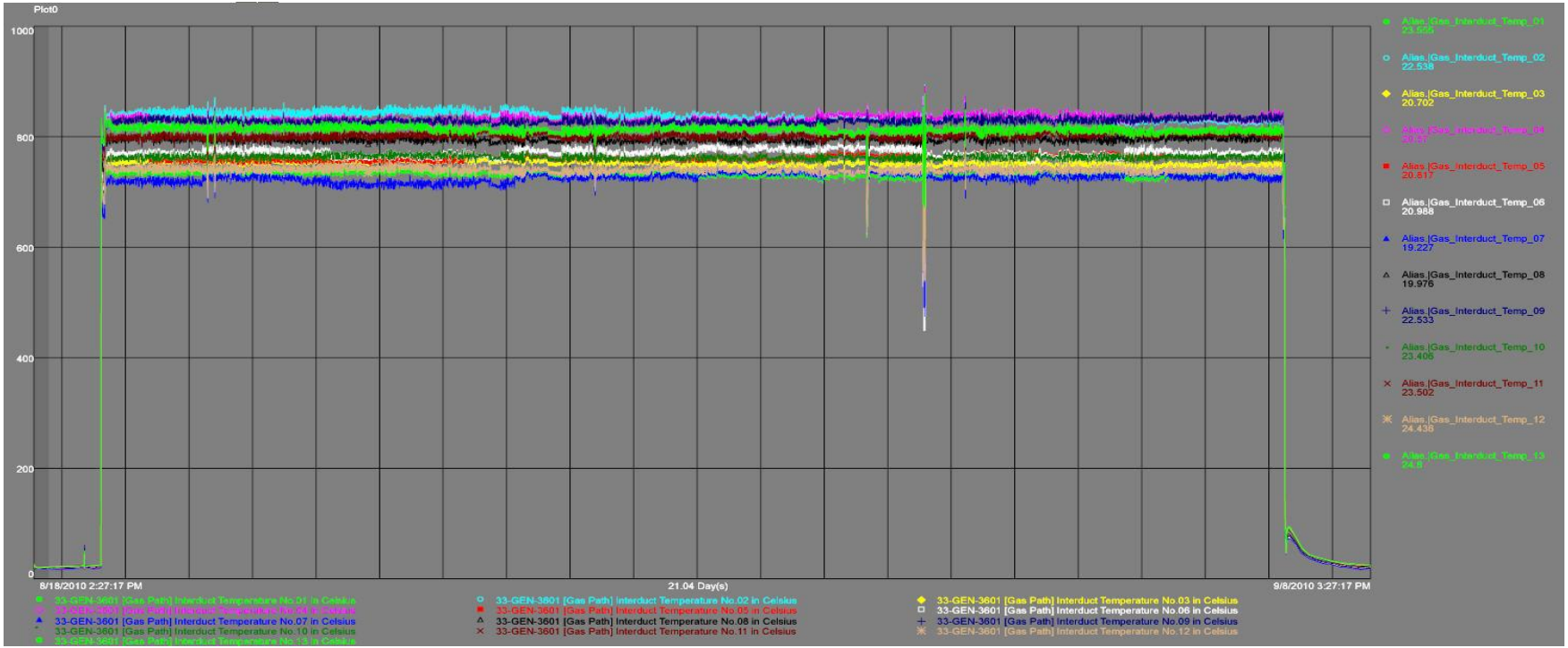
Repair

- The pump was placed out of service due to no pressure protection
- Instrument tech called out for TSR
- Tech performed recalibration (same work done on annual PM)
- Same problem occurred following day
- Tech was called out and transmitter was replaced

Case Study 3 Predictive Analytics

- Utilizing 1-year of historical performance data to determine expected performance
- Algorithms crunch data every 10 min
- Warnings occur based on deviations of expected (modeled) values to actual values
- Alarms occur when deviations persist (density)
- Smart Signal technology implemented on 9 pumps, 4 turbines, 3 incinerators
- This problem was detected 14 days prior to the failure on a turbine generator

Which Thermocouple is Deviating?



Results

- First predicted failure
- Decision was made to run-to-failure…it did.
- Numerous problems found when corrective maintenance was done
- Predictive analytics take time to gain trust in any organization
- Long term awareness of unseen failures and more credibility?

RESULTS

Maintenance Diagnostics Centers have demonstrated tremendous value:

- Centralized access to equipment and system diagnostics
- Automation of Equipment Calendar/Runtime-based PMs Utilizing ACE
- Eliminate Calendar/Runtime-based PMs on Like Devices with AF
- Providing post mortem and root cause analysis on equipment failures
- Communicating initial equipment diagnostics with Operations Centers Engineering, Field Maintenance, and other SMEs
- Assisting field maintenance with troubleshooting and validating corrective actions taken in the field
- Preventing unintended shutdowns and equipment outages
- Reduced Operational alarm loads, reduced intrusive maintenance, increased system integrity

TANGIBLE BENEFITS

M&DC BENEFITS	Who Benefits
Regulatory Compliance	
Alarm Management - Through the D&R Process & PI System	**O,E,M**
Provided Adequate Information To Controllers – D&R Viewer	**Ops**
Fatigue Mitigation – By Reducing Controller Alarm Loads	**Ops**
Compliance Validation – Process Information Available at all Times	**Everyone**
Compliance Deviation – Non Op Deviations Reported to M&DC	**O,E,M**
Management of Change – Changes managed in the D&R Viewer	**Everyone**
Regulatory Compliance SAVINGS	**Priceless**

Take Aways

- Proper Alarm Management can reap benefits far beyond just the control room
- Non-Operational alarms does not mean non-important….
- The paradigm shift to information management versus alarm management
- Everyone has data, but who can turn it into information that produces bottom line cost savings without sacrificing system integrity?

Contact Information

Thank you