OSIsoft® UC 2010

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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Alyeska Pipeline Service Company

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Managing Partner, Technology
Casne Engineering, Inc.

PRESENTATION OVERVIEW

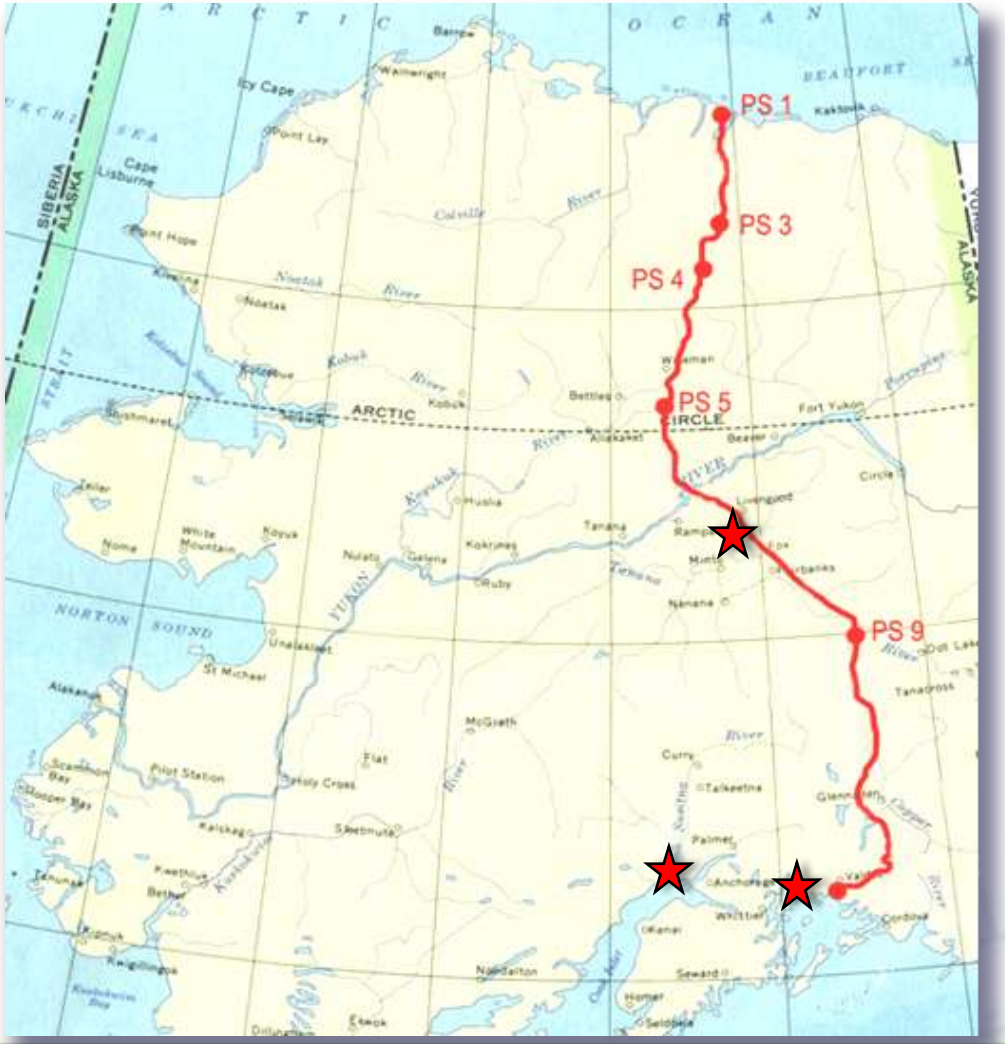
- Introductions
- Background: Mission, Goals and Challenges
- Maintenance Strategies & RCM
- Maintenance Diagnostics and Resource Center
- System Architecture
- The Results
- Next Steps

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

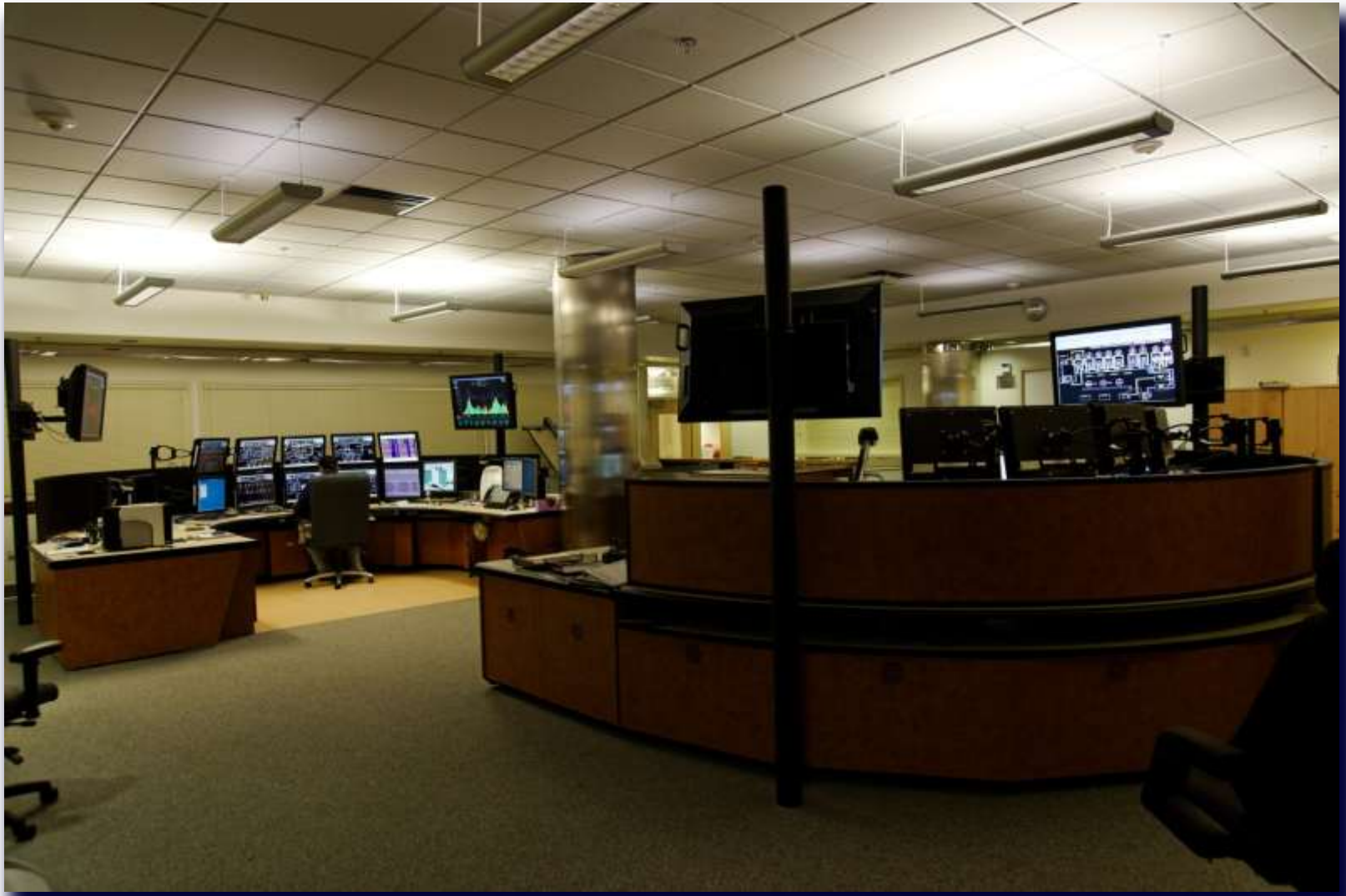
CASNE ENGINEERING, INC.
Electrical and Technology Consultants

ABOUT ALYESKA PIPELINE



Alyeska pipeline SERVICE COMPANY

- 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

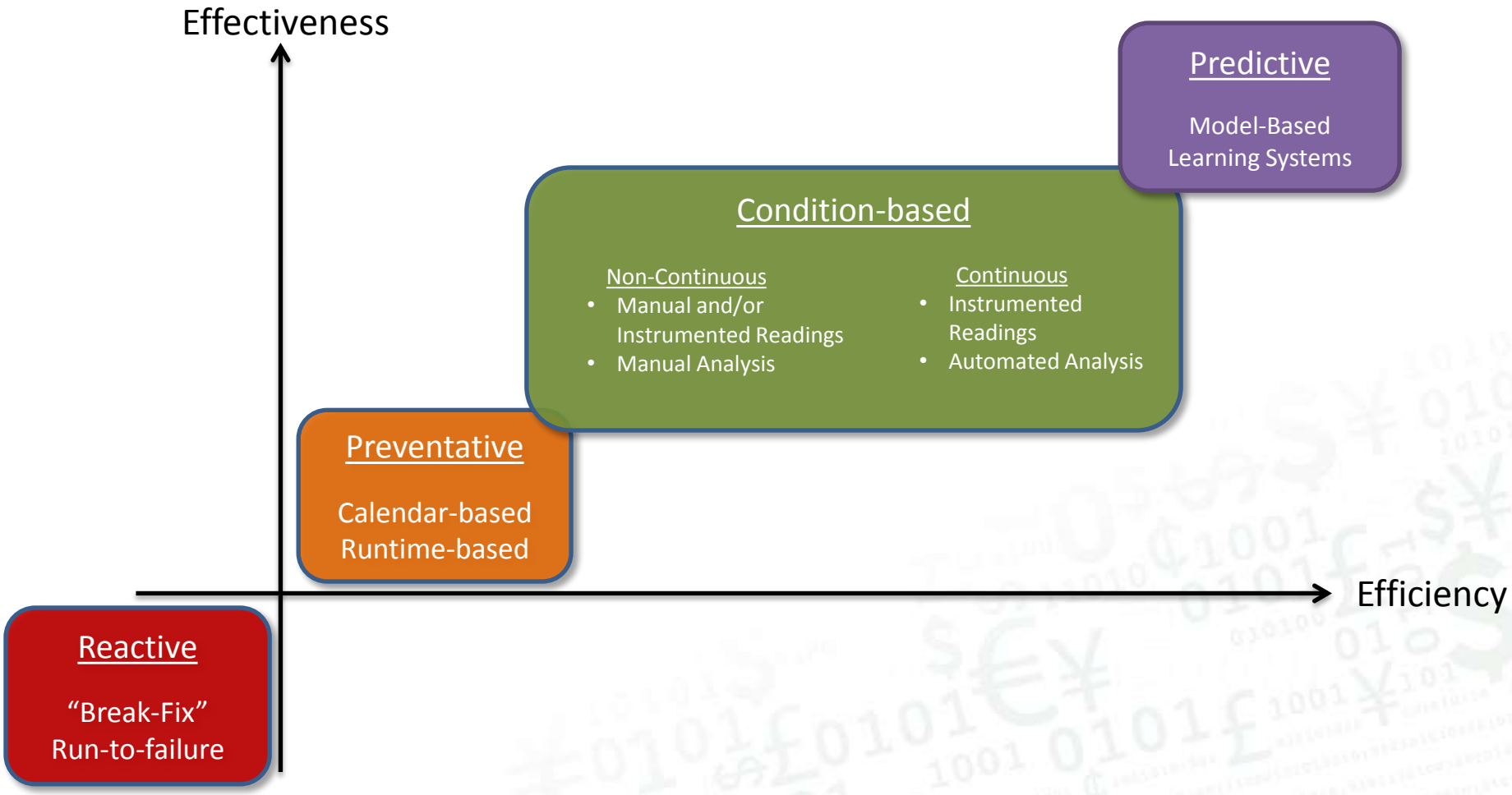
- Mission
  - Ensure pipeline reliability and integrity using advanced maintenance strategies
- Goals
  - Proactive vs. reactive maintenance
  - Optimize available resources
  - Discover new & better ways to operate
- Challenges
  - Difficult operating environment
  - Complexities of modernization
 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

RCM – What is it?

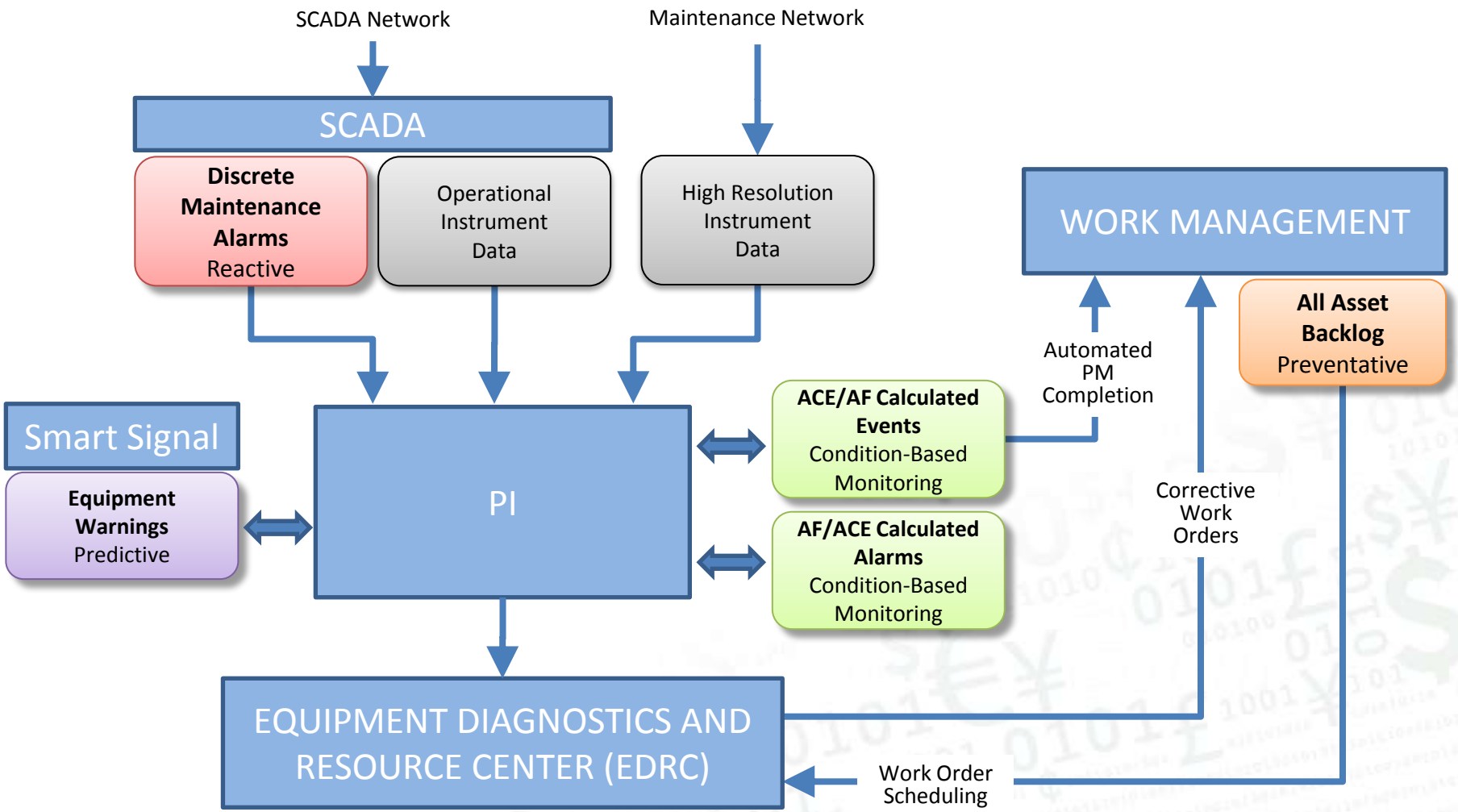
Reliability-Centered Maintenance is a process used to determine what must be done to ensure that any physical asset continues to do what its users expect in its present operating context. ~Moubray, RCM II (1992)

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

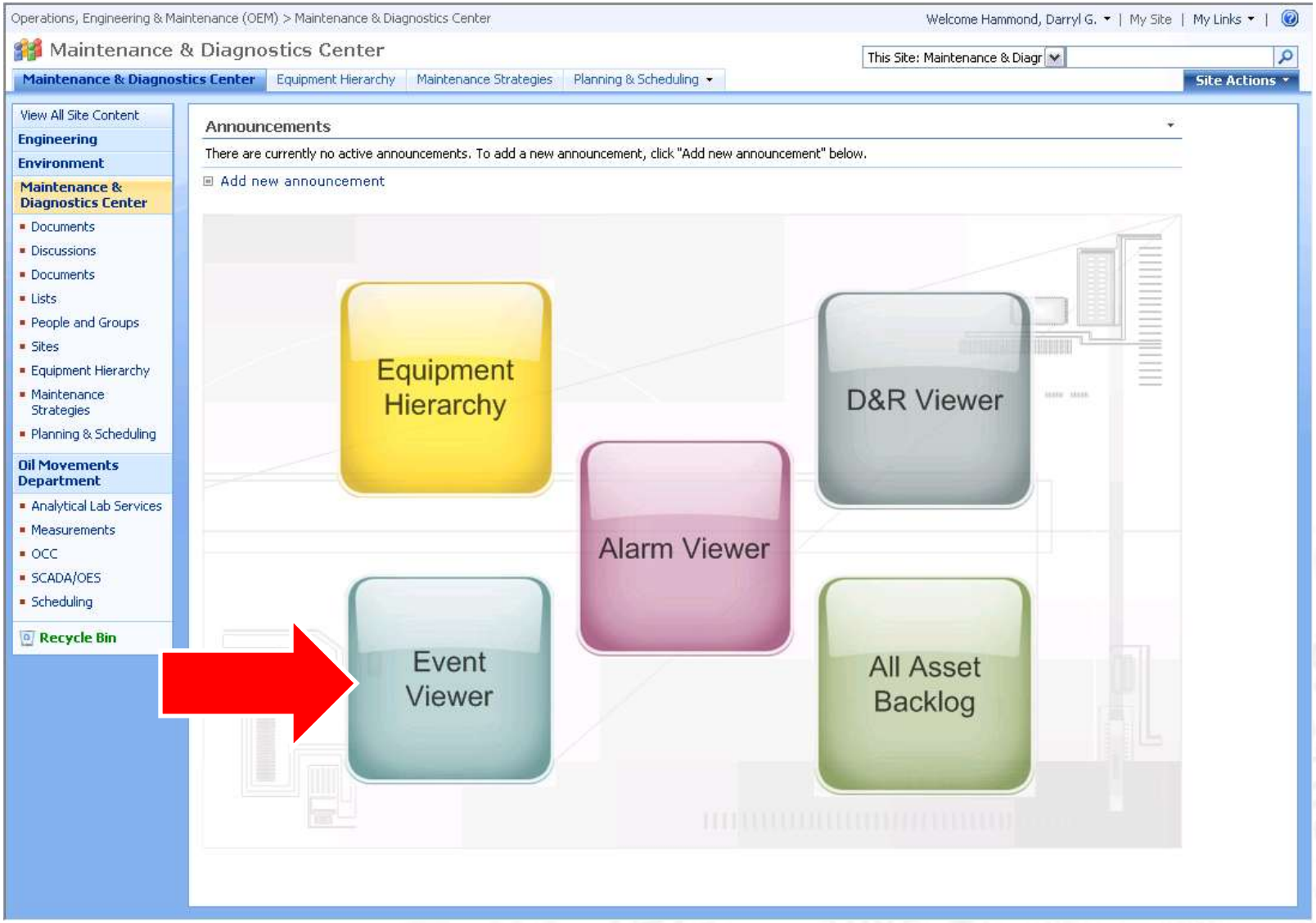
Evolution of Maintenance Strategies



Maintenance Strategies in Action



Continuous Monitoring proof of concept RGV Valves



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

File Edit View Favorites Tools Help

Maintenance & Diagnostics Center

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

Maintenance & Diagnostics Center > XAPLibrarys > eventtrends

Search Criteria

Start Date: 8/13/2010 | 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

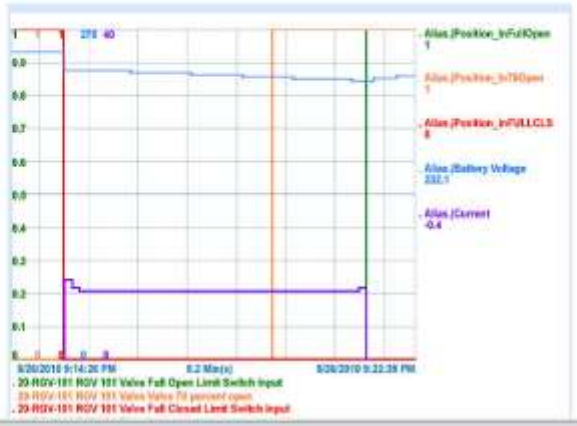
Queried Events

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

Alarms History: *-30d | Associate Alarms

CLOSE EVENT

OPEN EVENT



REFRESH TRENDS

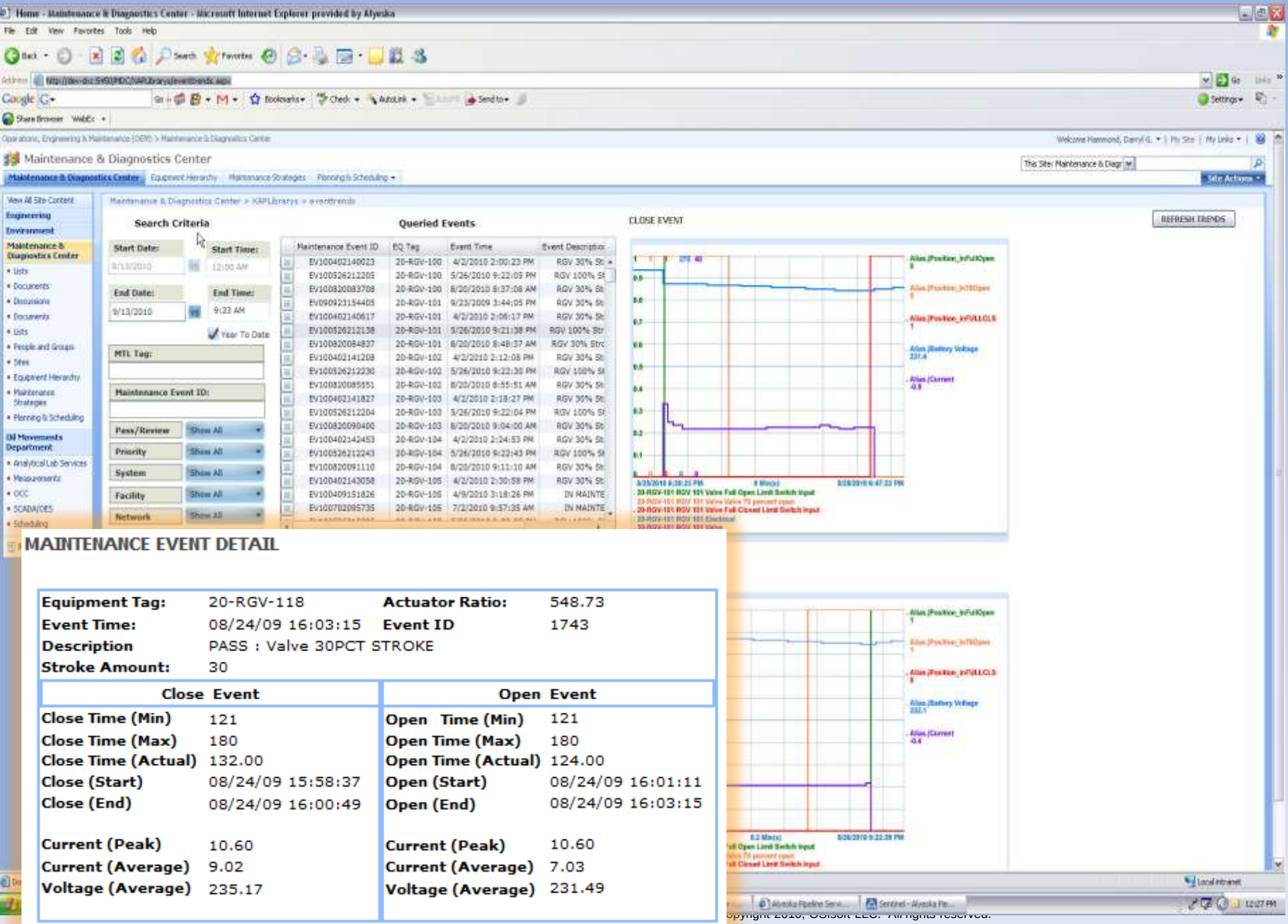
Equipment Tag: 20-RGV-101 **Actuator Ratio:** 548.73

Event Time: 5/26/2010 9:21:38 PM **Event ID:** EV100526212382043

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)	572
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

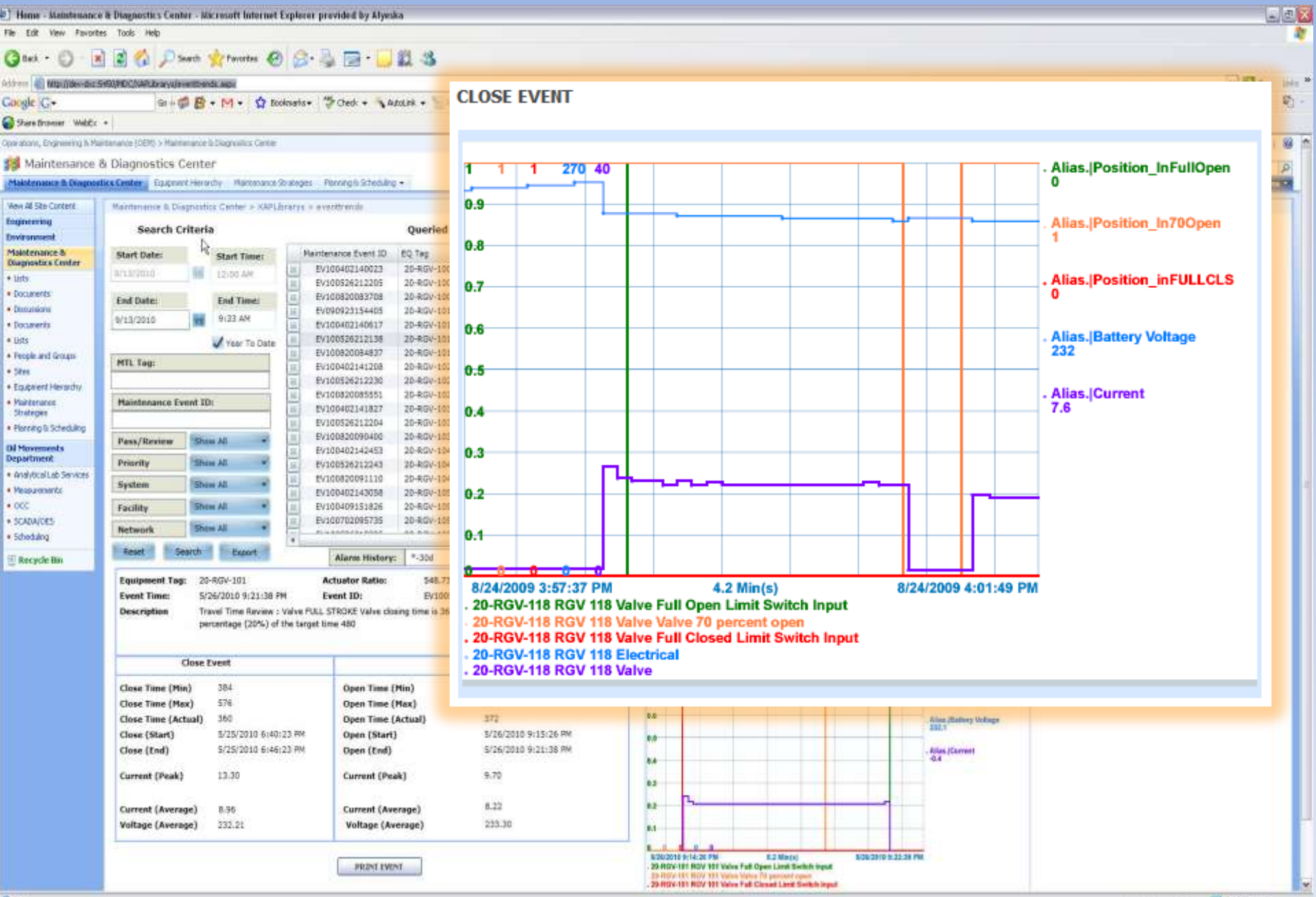
PRINT EVENT

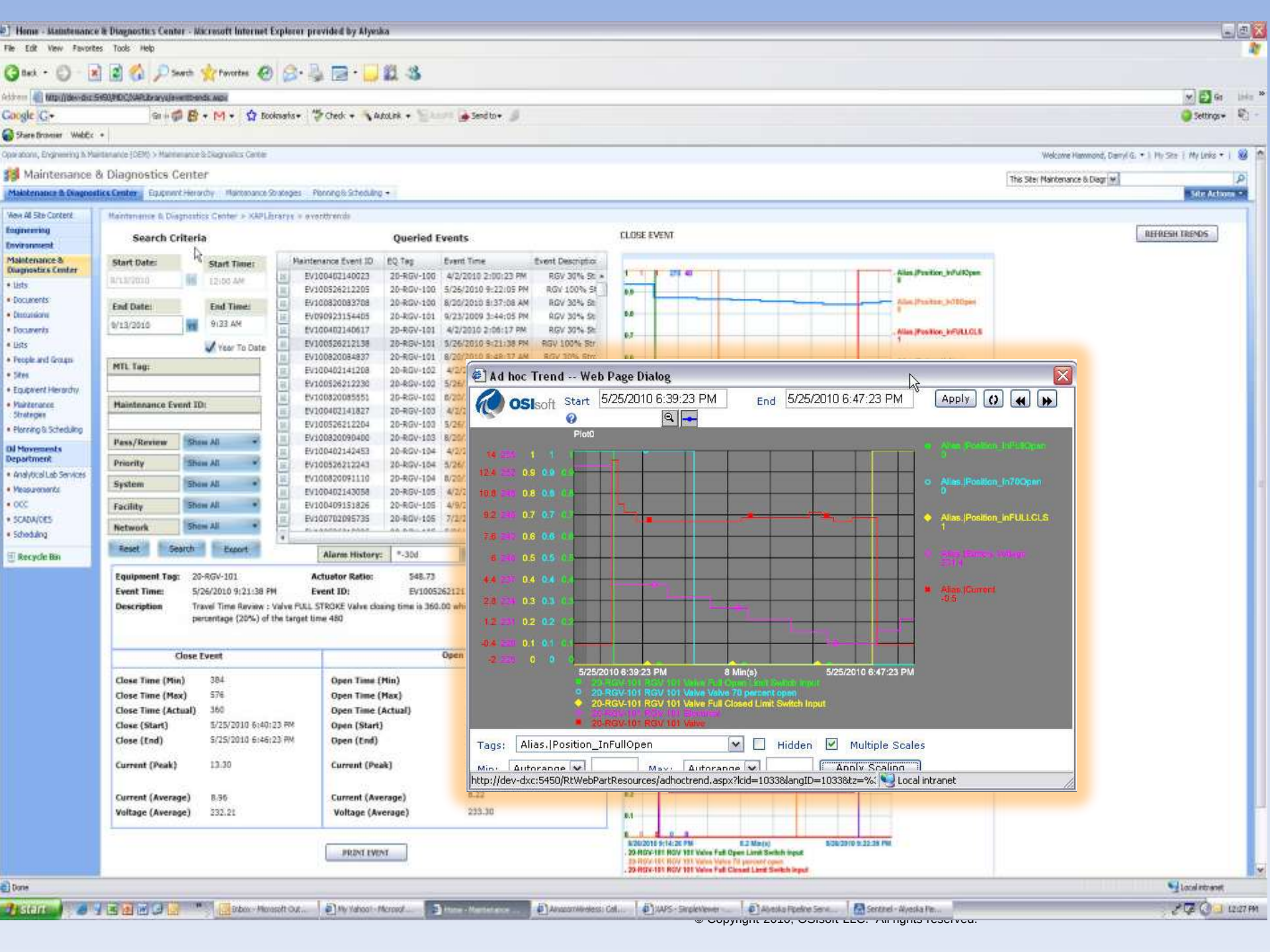


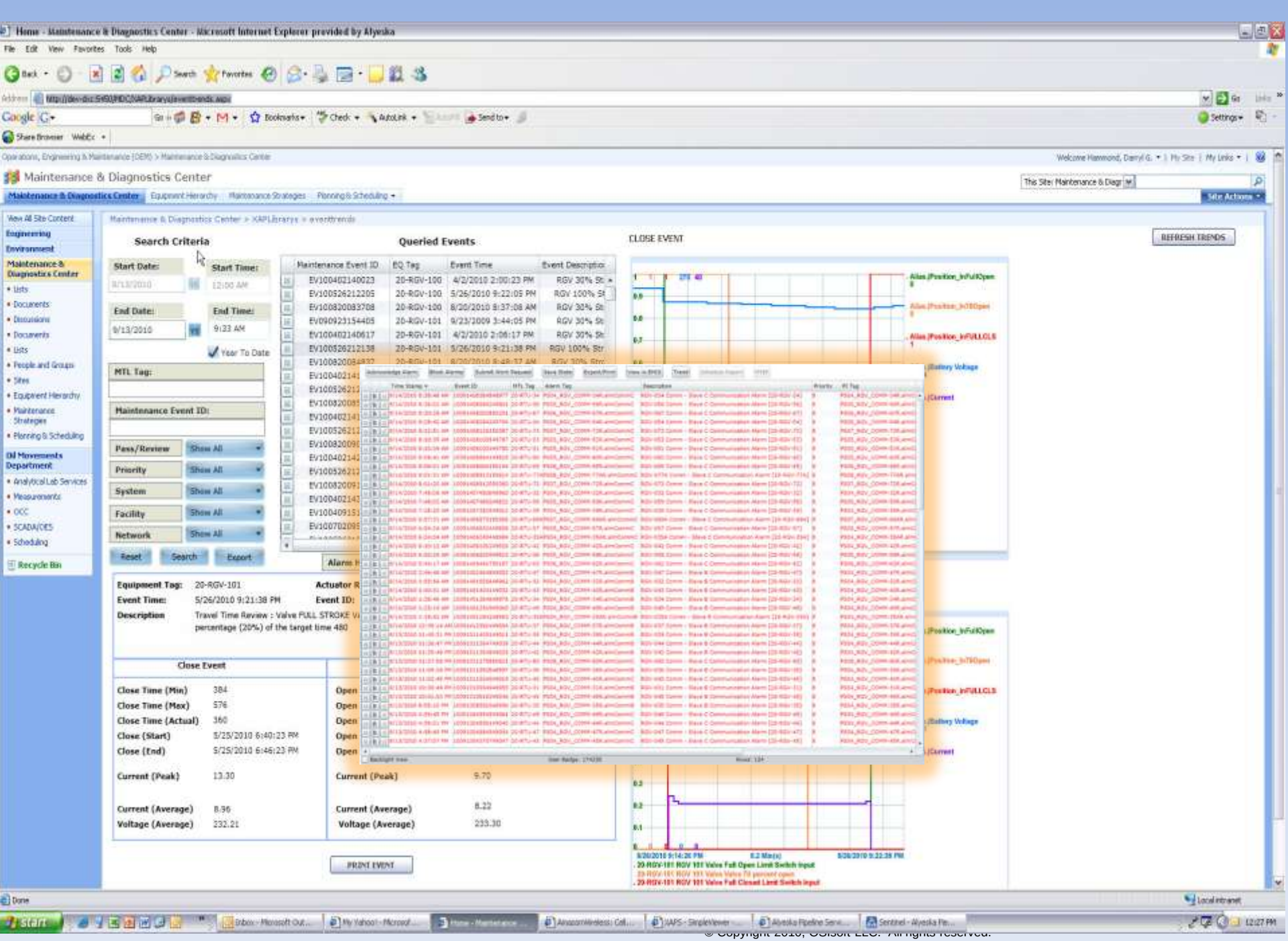
MAINTENANCE EVENT DETAIL

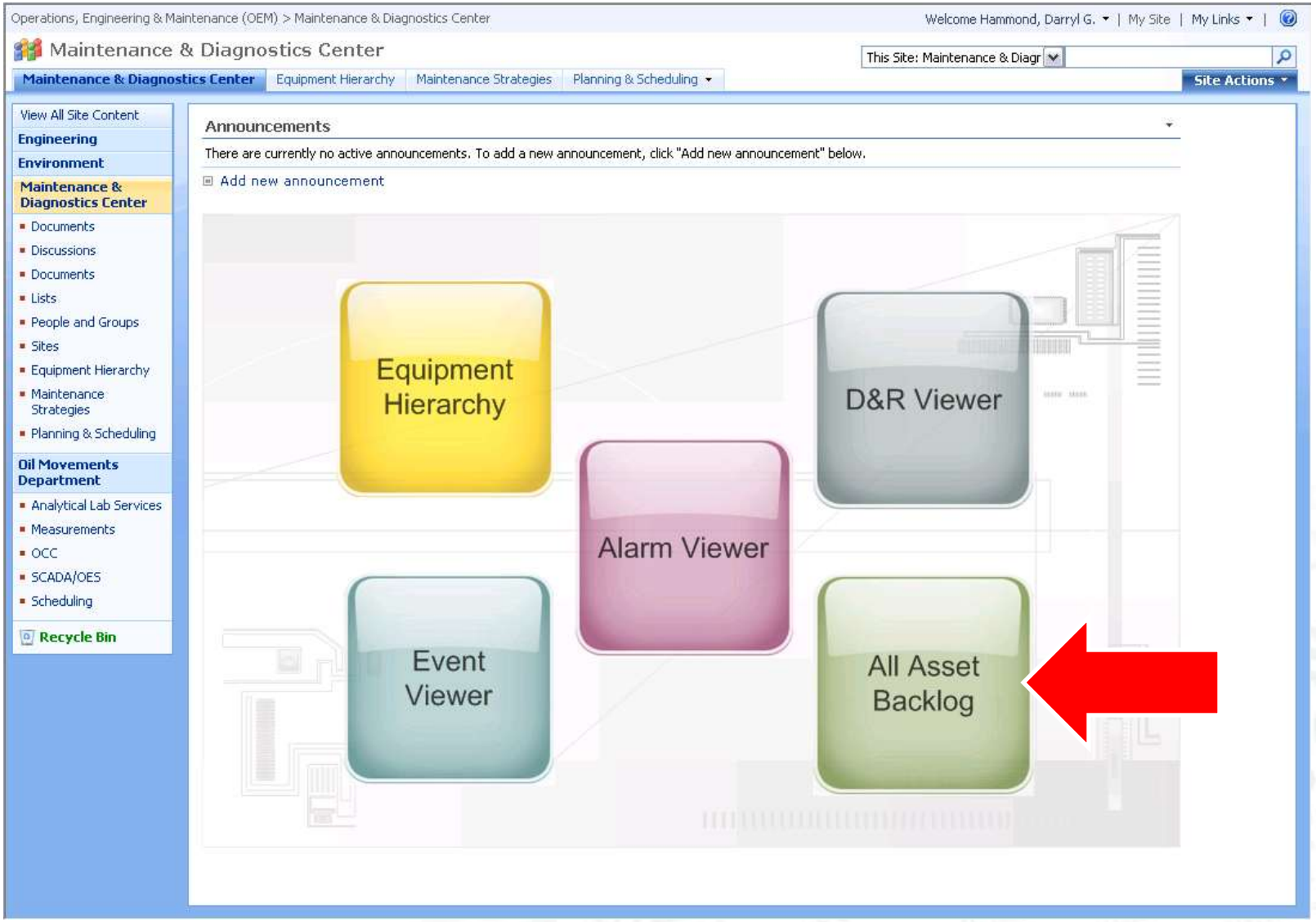
Equipment Tag:	20-RGV-118	**Actuator Ratio:**	548.73
Event Time:	08/24/09 16:03:15	**Event ID**	1743
Description	PASS : Valve 30PCT STROKE		
Stroke Amount:	30		

Close Event		Open Event	
Close Time (Min)	121	**Open Time (Min)**	121
Close Time (Max)	180	**Open Time (Max)**	180
Close Time (Actual)	132.00	**Open Time (Actual)**	124.00
Close (Start)	08/24/09 15:58:37	**Open (Start)**	08/24/09 16:01:11
Close (End)	08/24/09 16:00:49	**Open (End)**	08/24/09 16:03:15
Current (Peak)	10.60	**Current (Peak)**	10.60
Current (Average)	9.02	**Current (Average)**	7.03
Voltage (Average)	235.17	**Voltage (Average)**	231.49




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
Alarms History:
Equipment Tag: 20-RGV-101
Actuator Ratio: 548.73
Event Time: 5/26/2010 9:21:38 PM
Event ID:
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
Open Time (Min)
Open Time (Max)
Open Time (Actual)
Open (Start)
Open (End)
Current (Peak)
Current (Average)
Voltage (Average) 233.30
PRINT EVENT
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
5/25/2010 6:39:23 PM
8 Min(s)
5/25/2010 6:47:23 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
Tags: Alias.|Position_InFullOpen
Hidden
Multiple Scales
Apply Scaling
http://dev-dxc:5450/RtWebPartResources/adhoctrend.aspx?lcid=1033&langID=1033&tz=%:
Local intranet



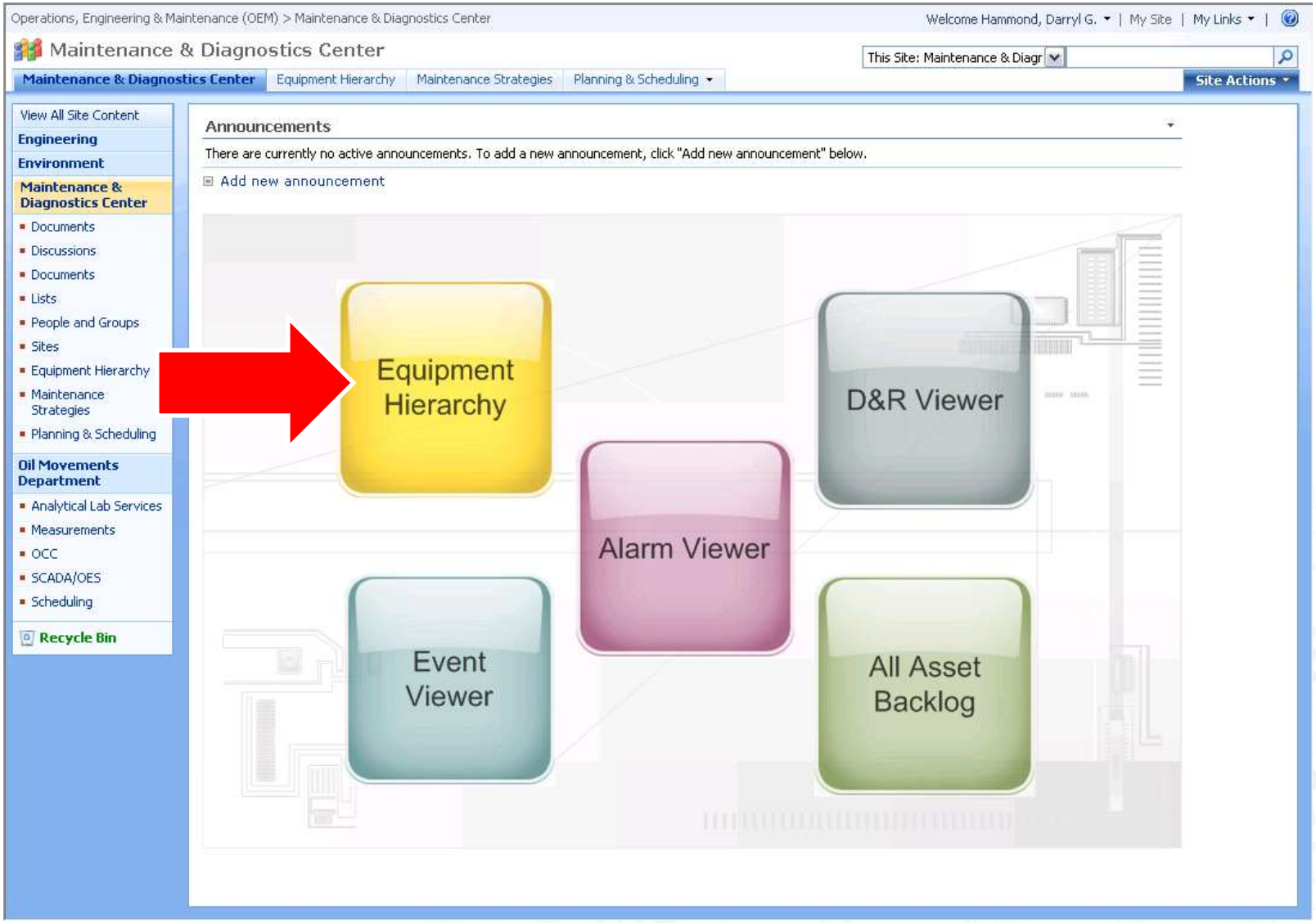


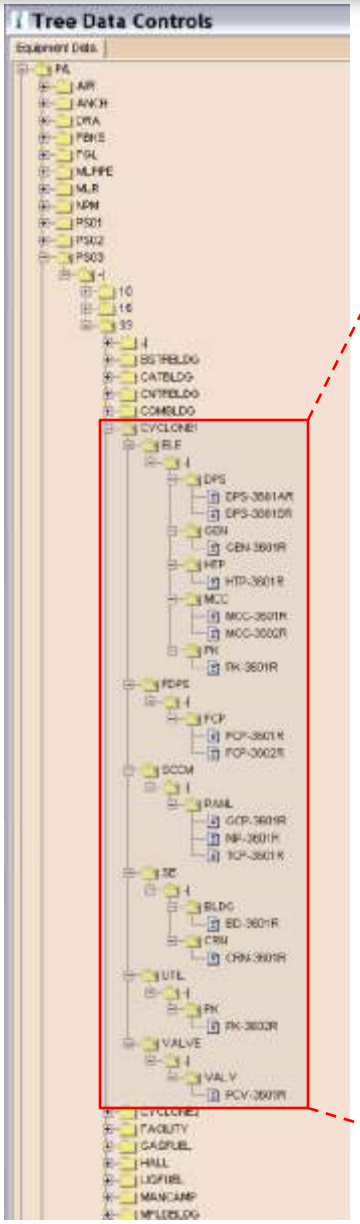
Work Management

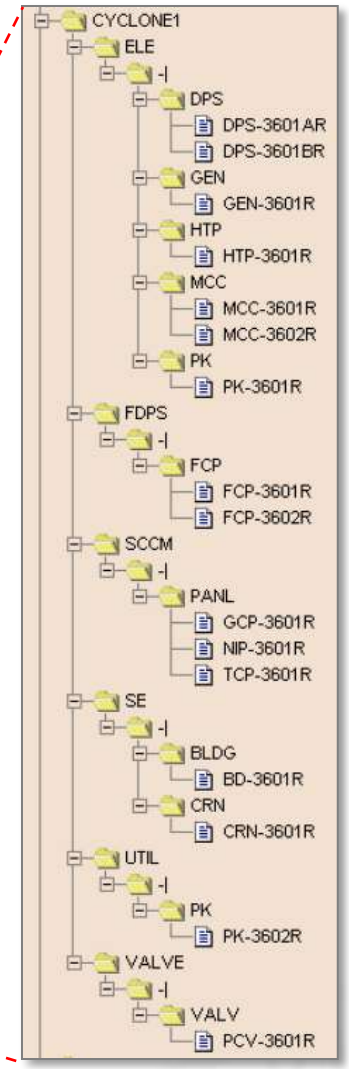
Excel Web Access - AllAssetTemplate

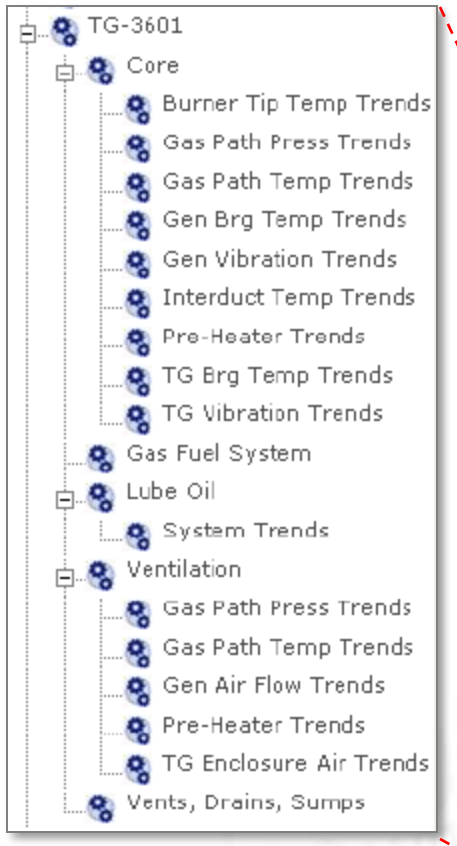
Open | Update | Find

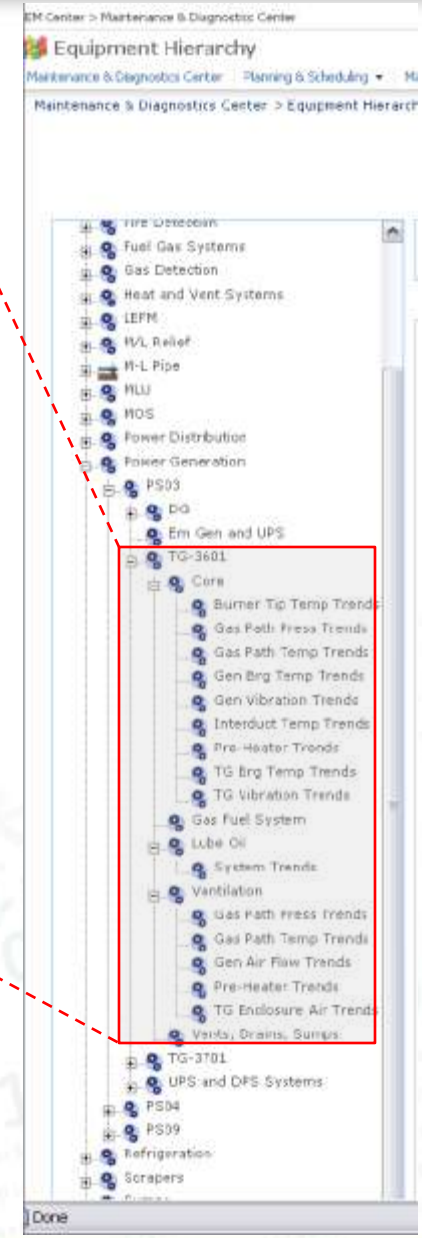
	A	B	C	D	E	F	G	H	I	J
1	Ace_Calc	Event_ID	ACE_Event_Date	To Schedule	Score	Task Status	Ops Sys	Tag #	Work Group	Crew Code
2					322	READY		OASIS #6905~AIR QUALITY SUPPC		
3					172	READY	INVC	0000005915-0	INVCTL	INV
4					-487	READY	GMB	34-SYS-ELEC	PS#04	34M
5					476	READY	FMB	39-BD-4701R	PMC	39CS
6					451	READY	FMB	39-BD-2	PMC	39CS
7					286	READY	INVC	R&R ENDUSER EG	INVCTL	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 PR	VHF
13					431	READY	P-EN	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









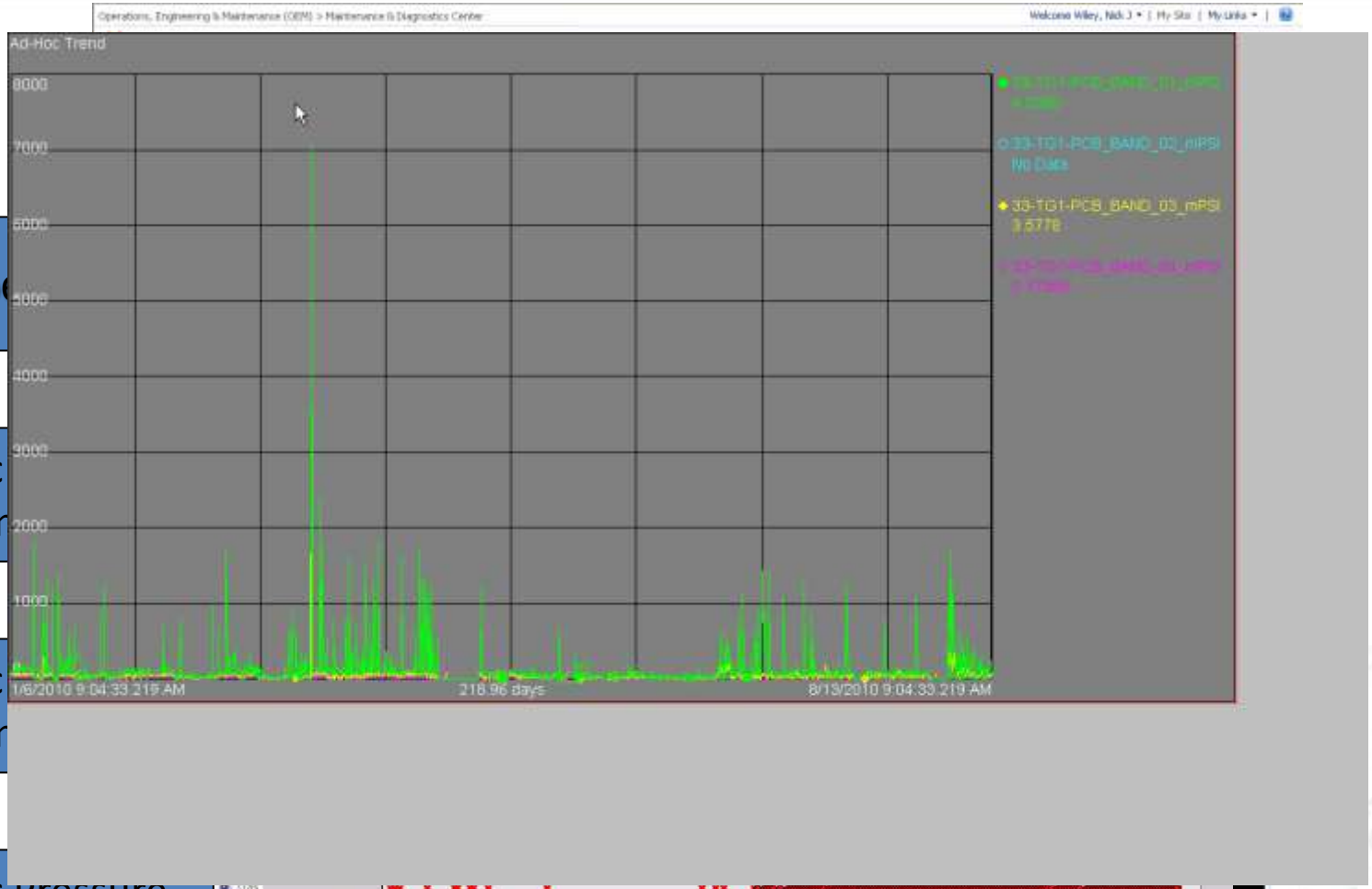


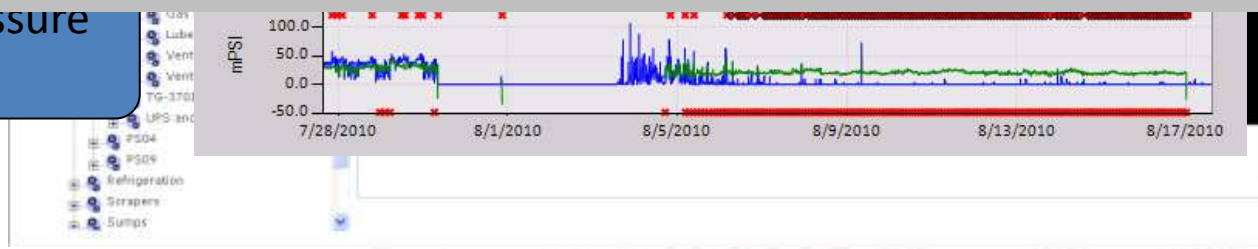
Spe

Acoustic
Bar

Acoustic
Bar

Acoustic Pressure
Band 3





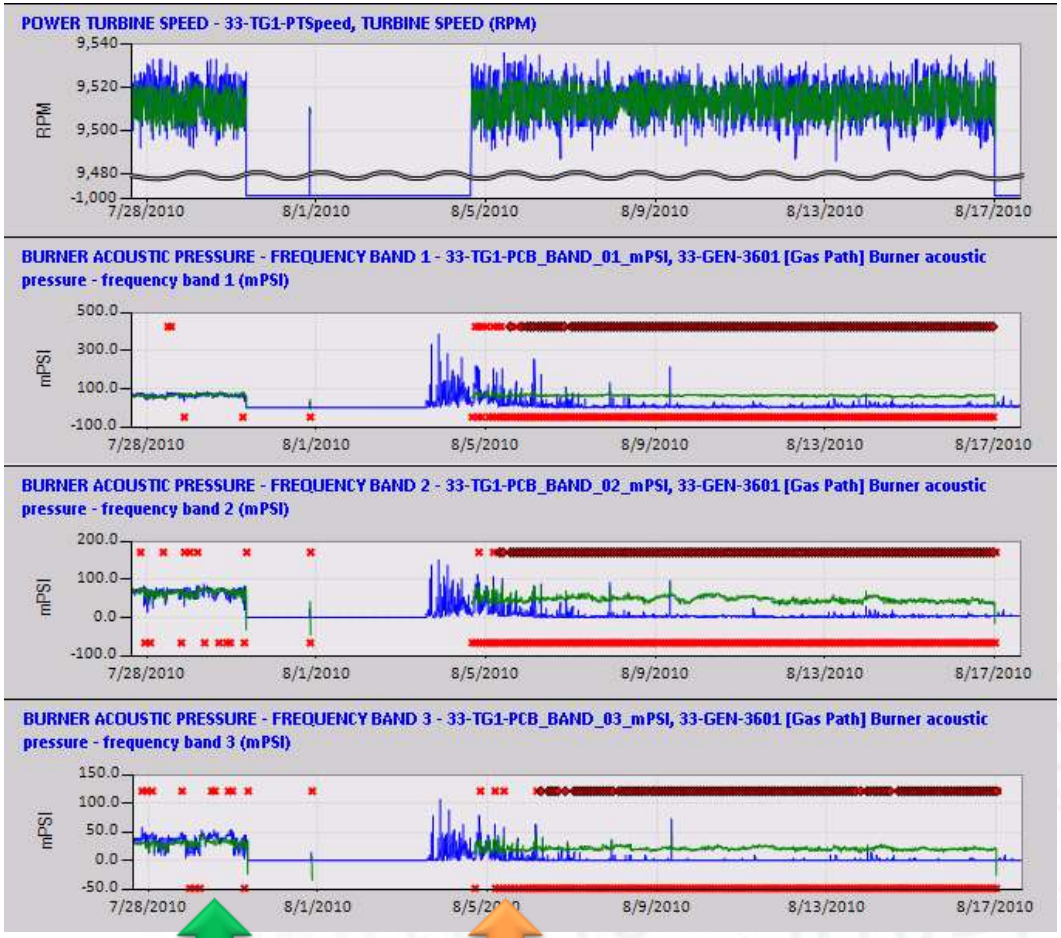
Going beyond the usual sensors… burner acoustic pressures – gas turbine generator

Speed

Acoustic Pressure Band 1

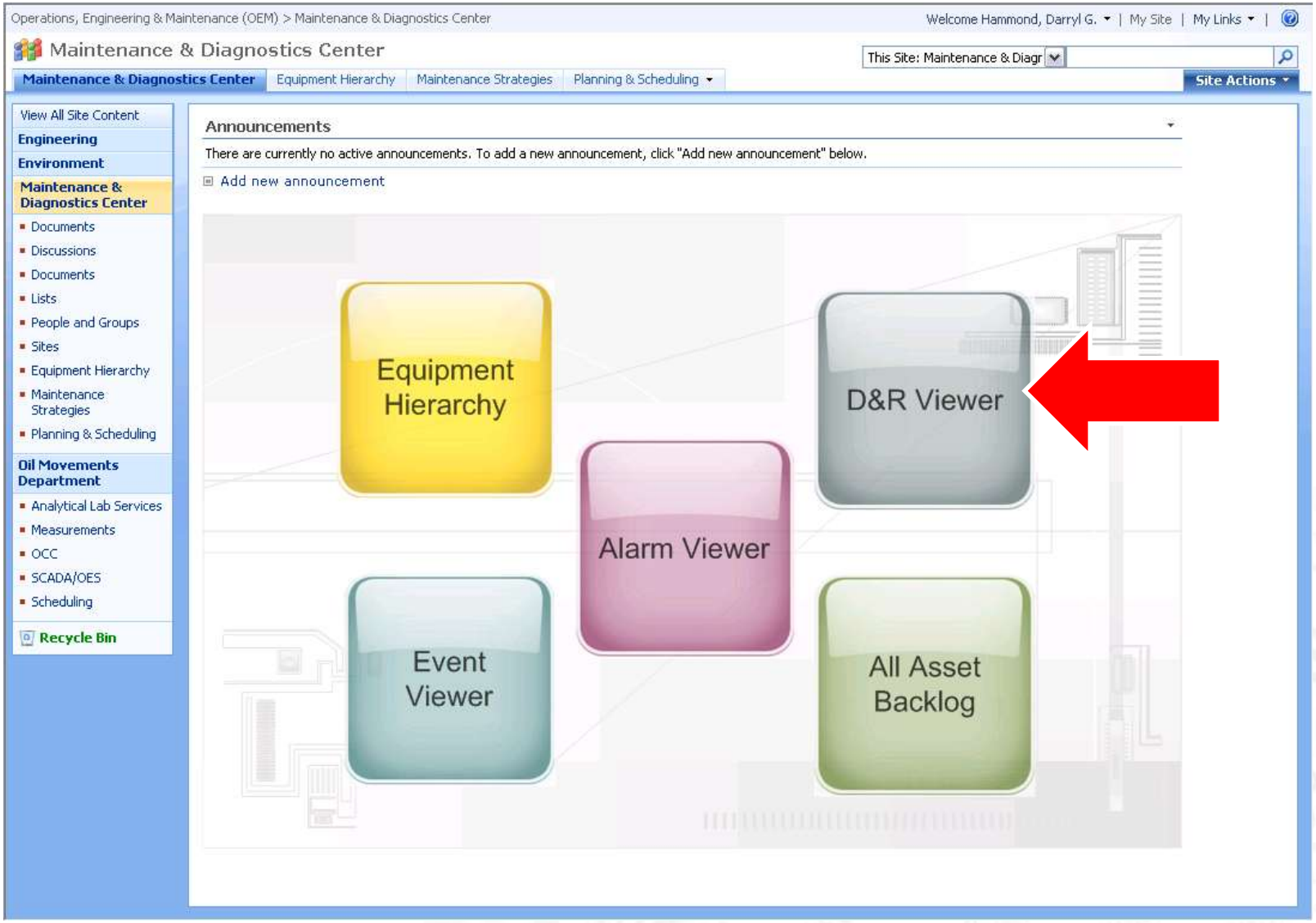
Acoustic Pressure Band 2

Acoustic Pressure Band 3

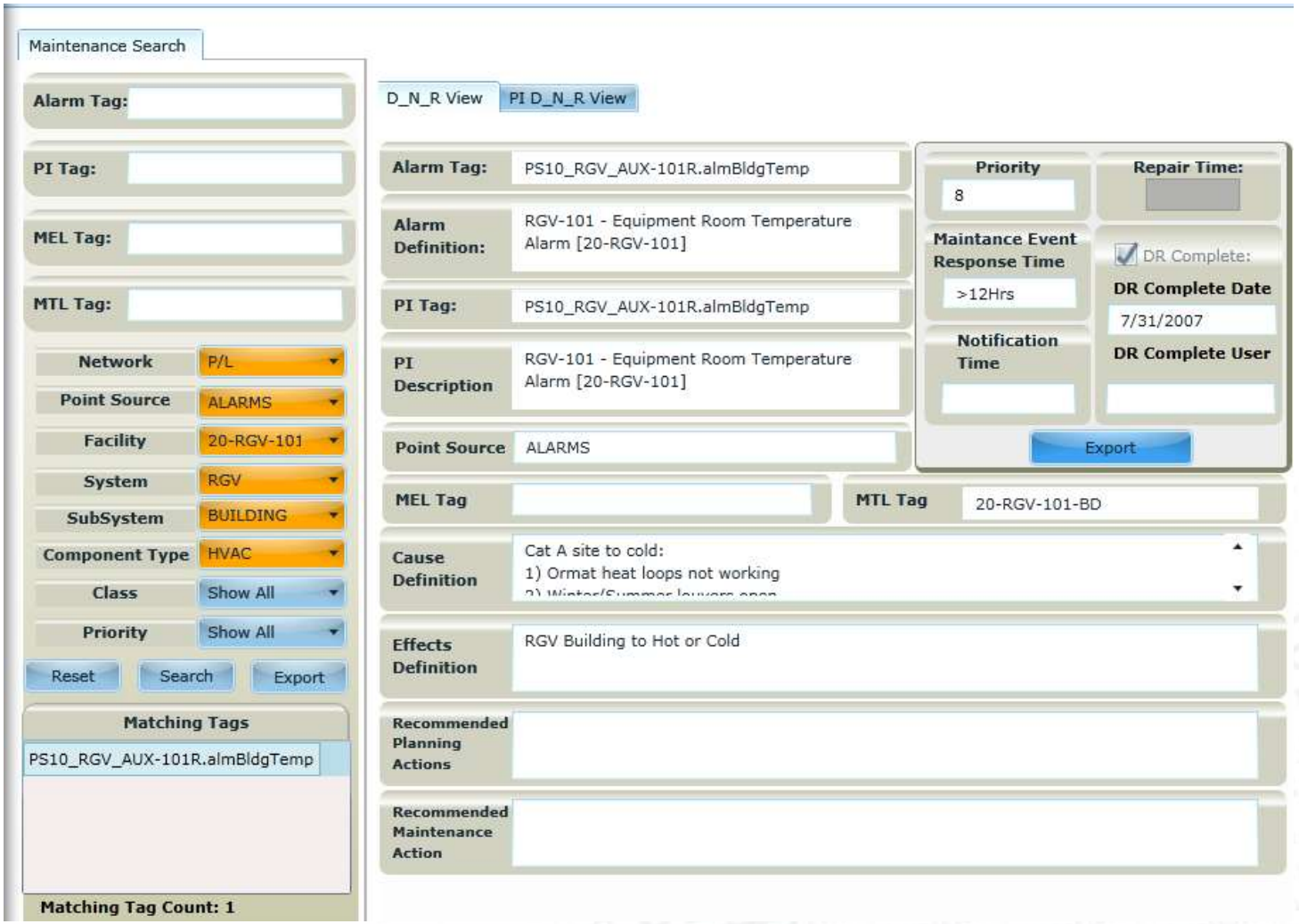


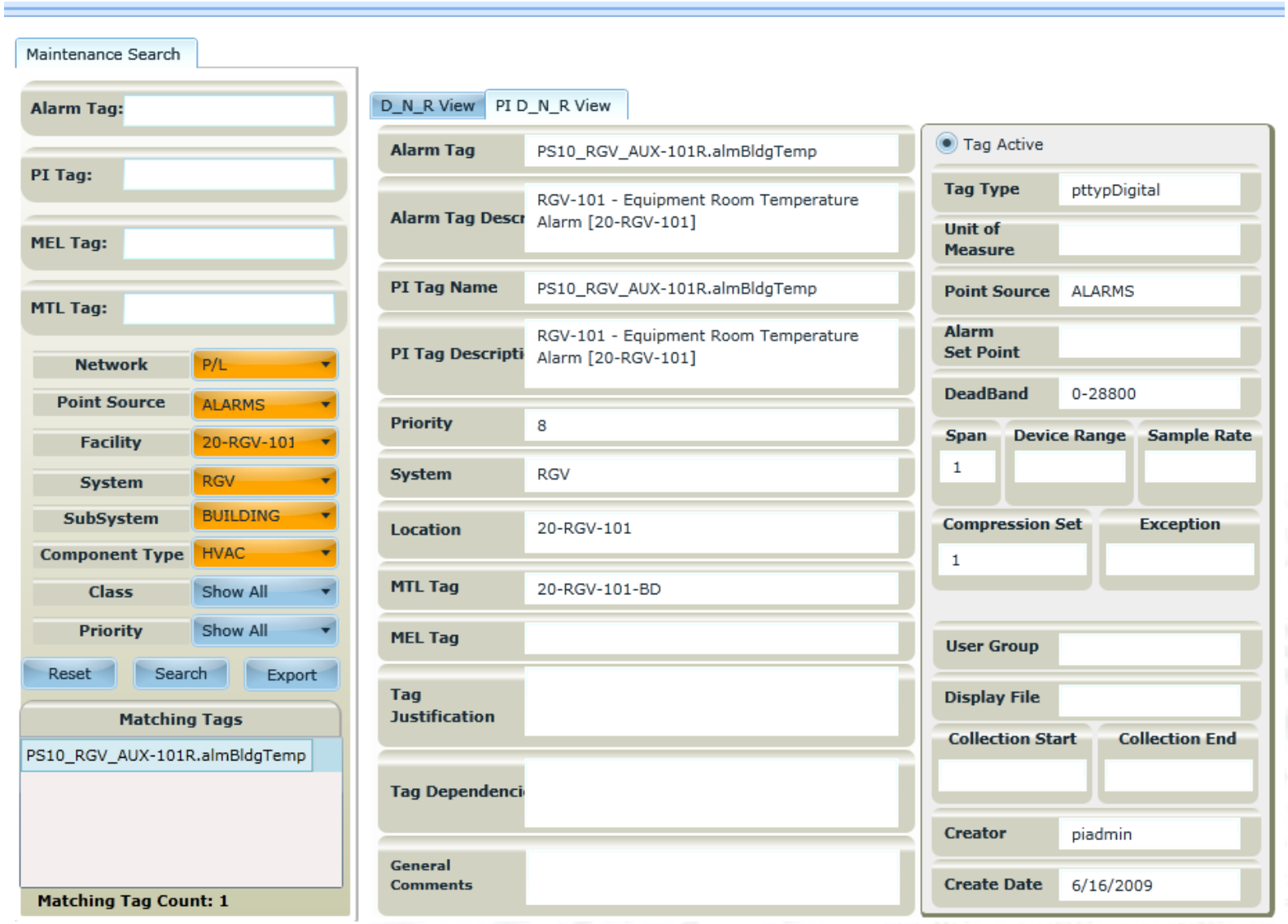
Tracking the Model

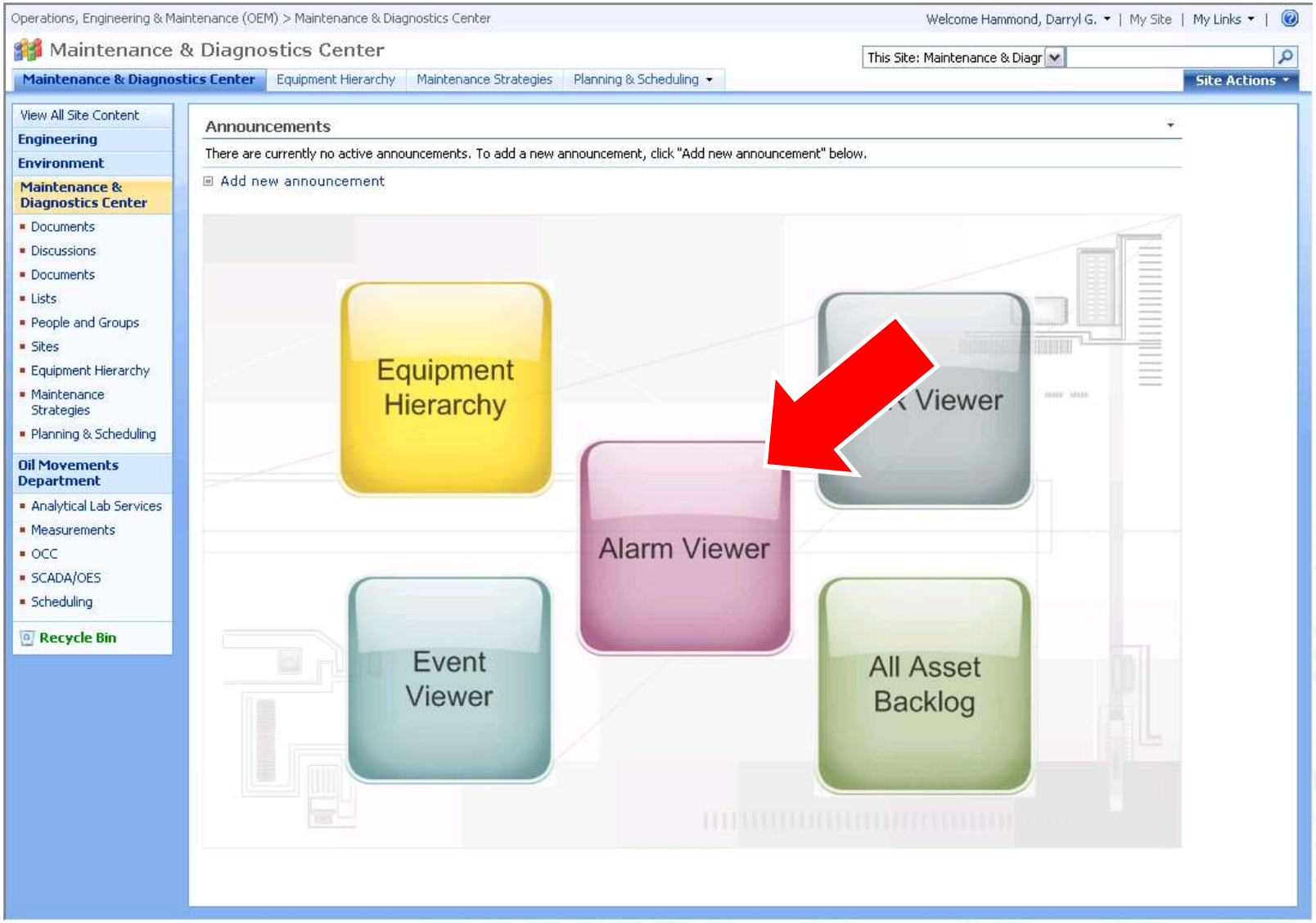
Significant change after re-start



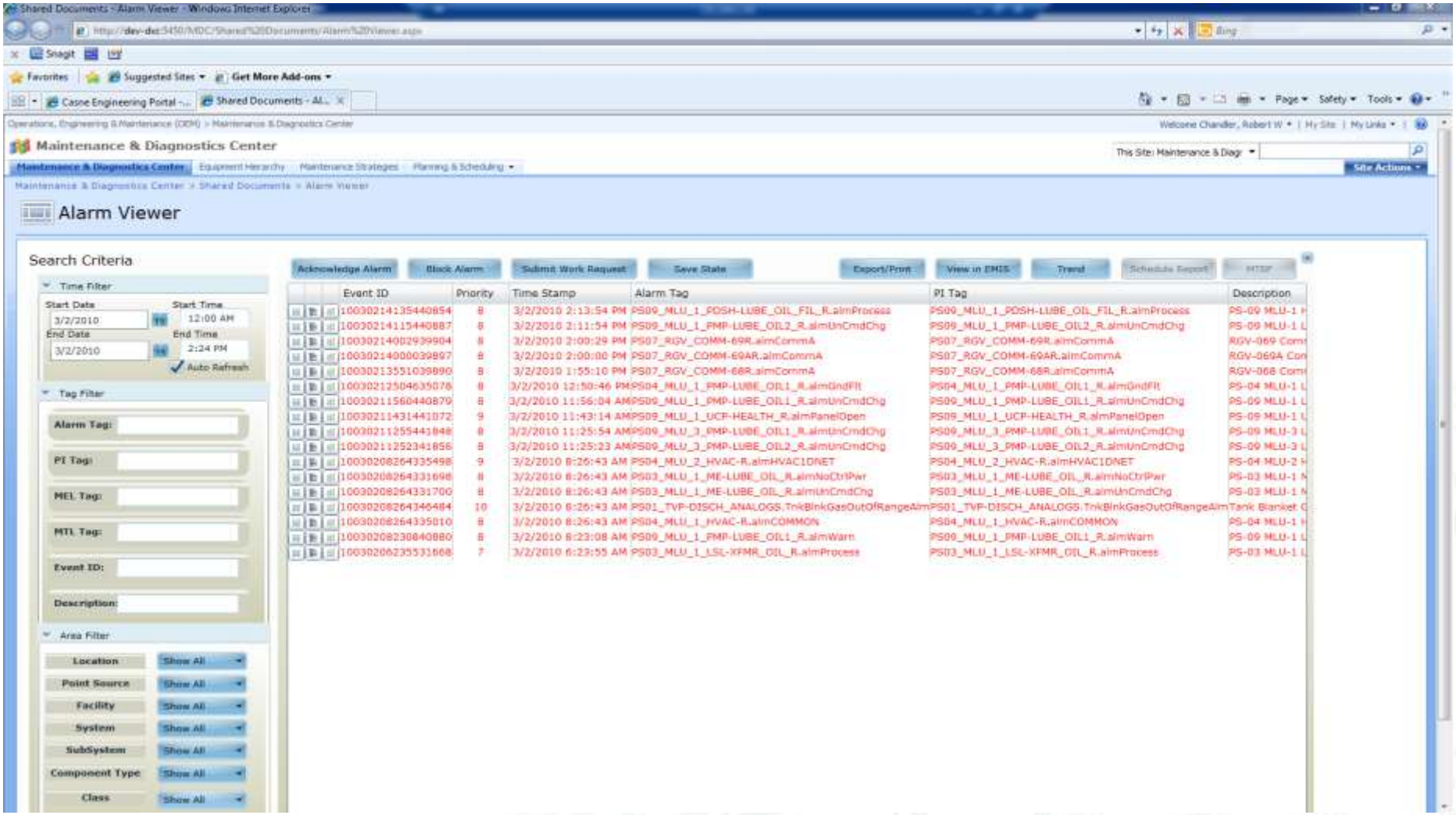
Documentation and Rationalization

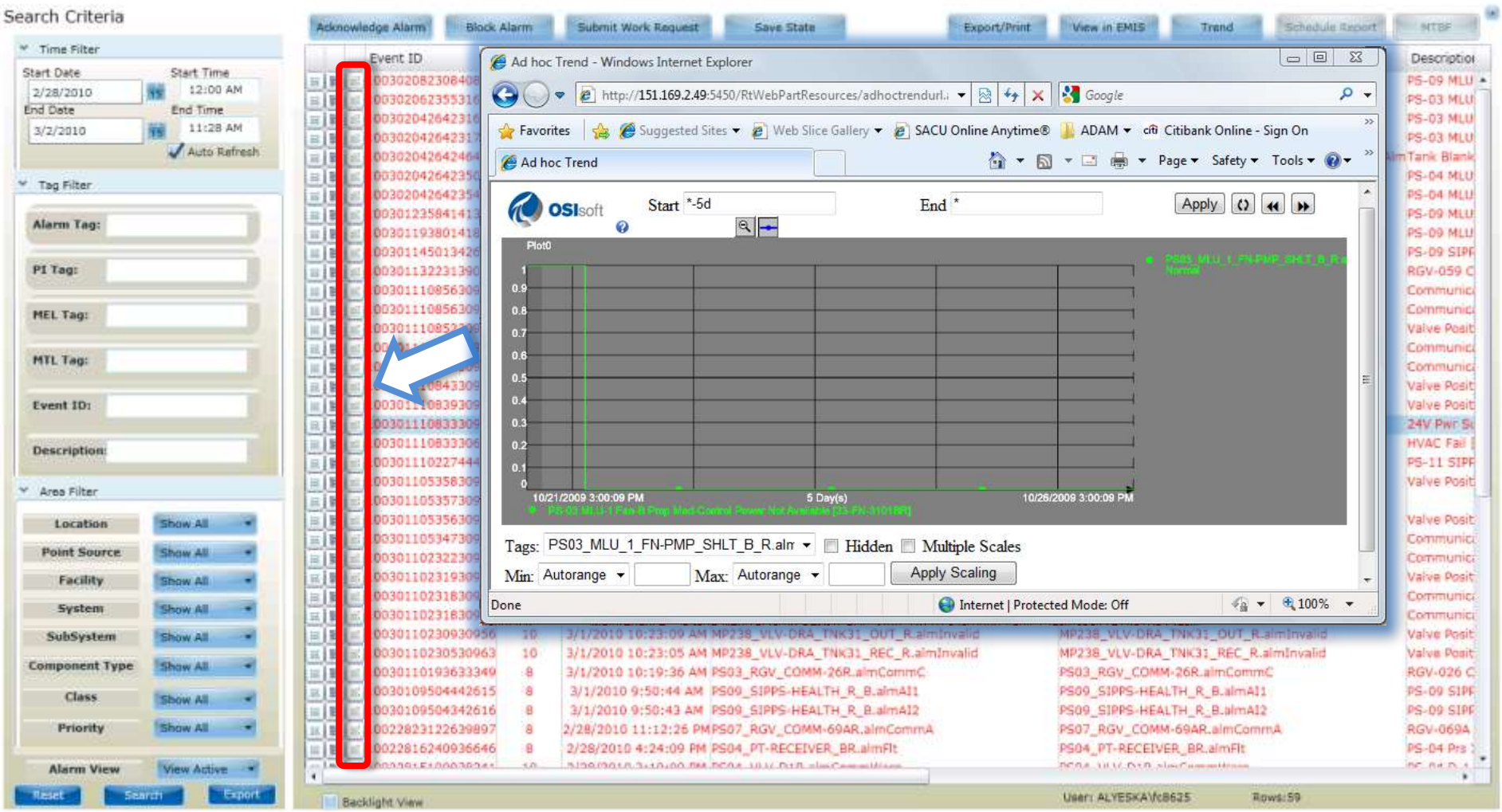


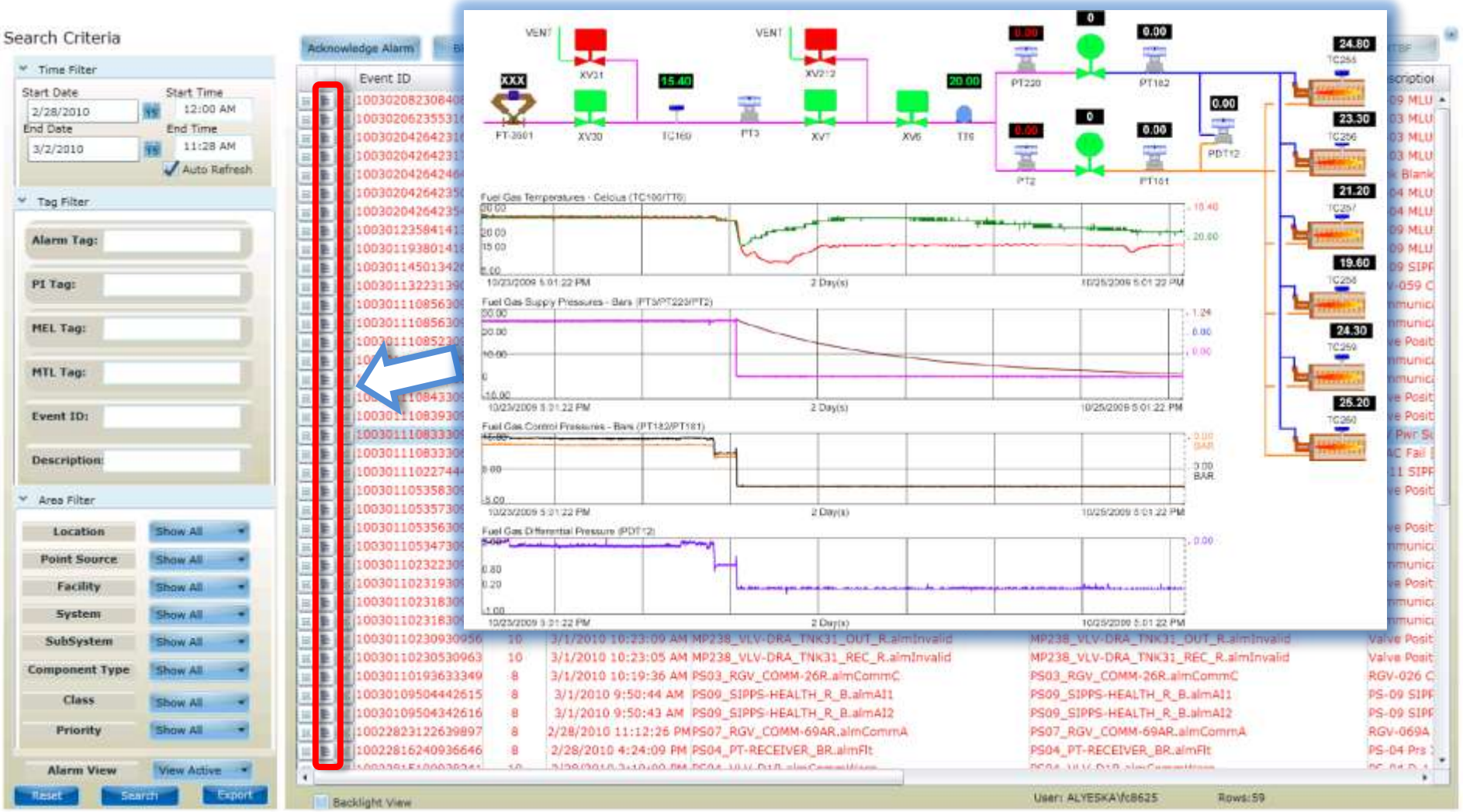


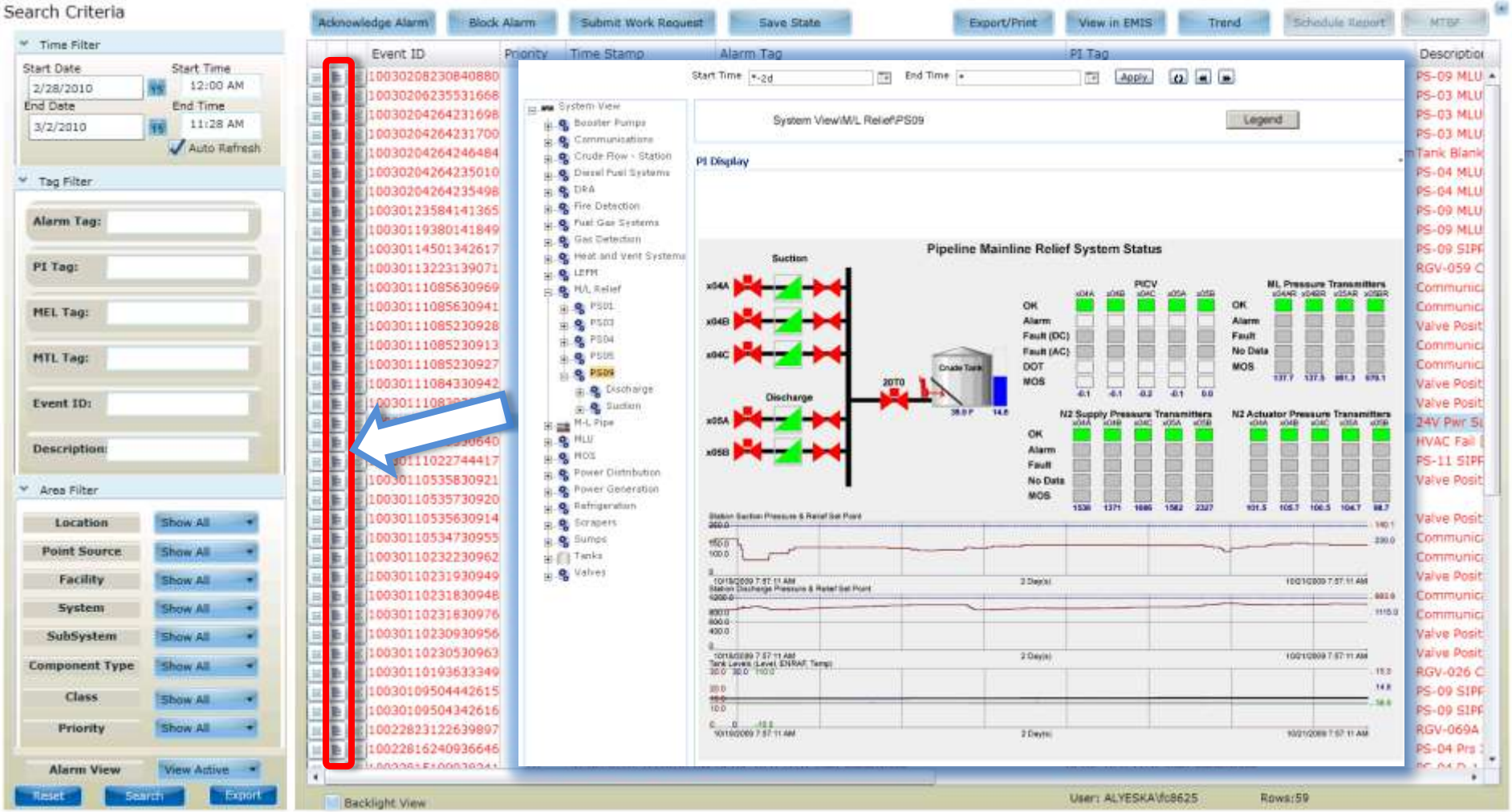


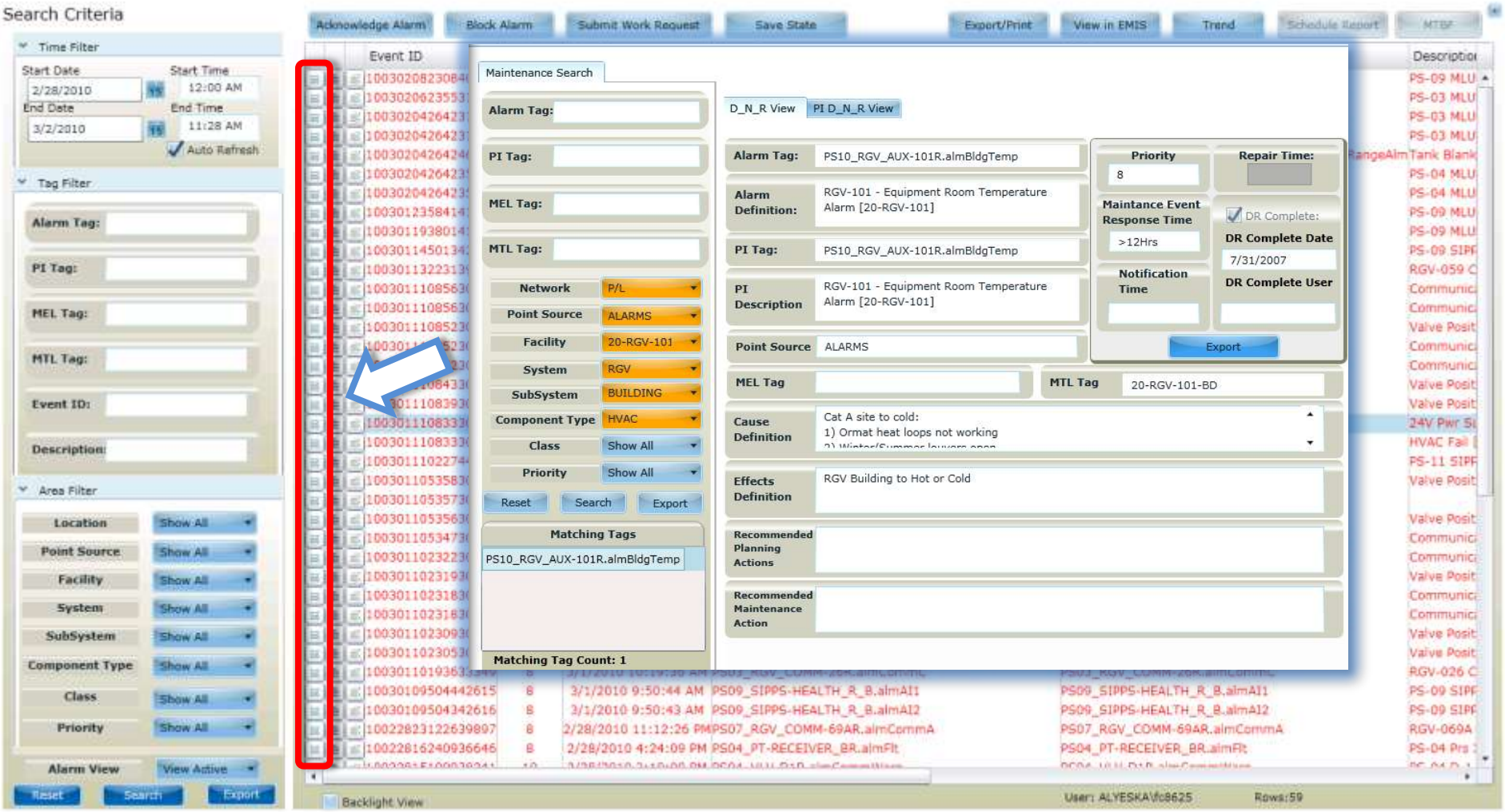
Alarm Management

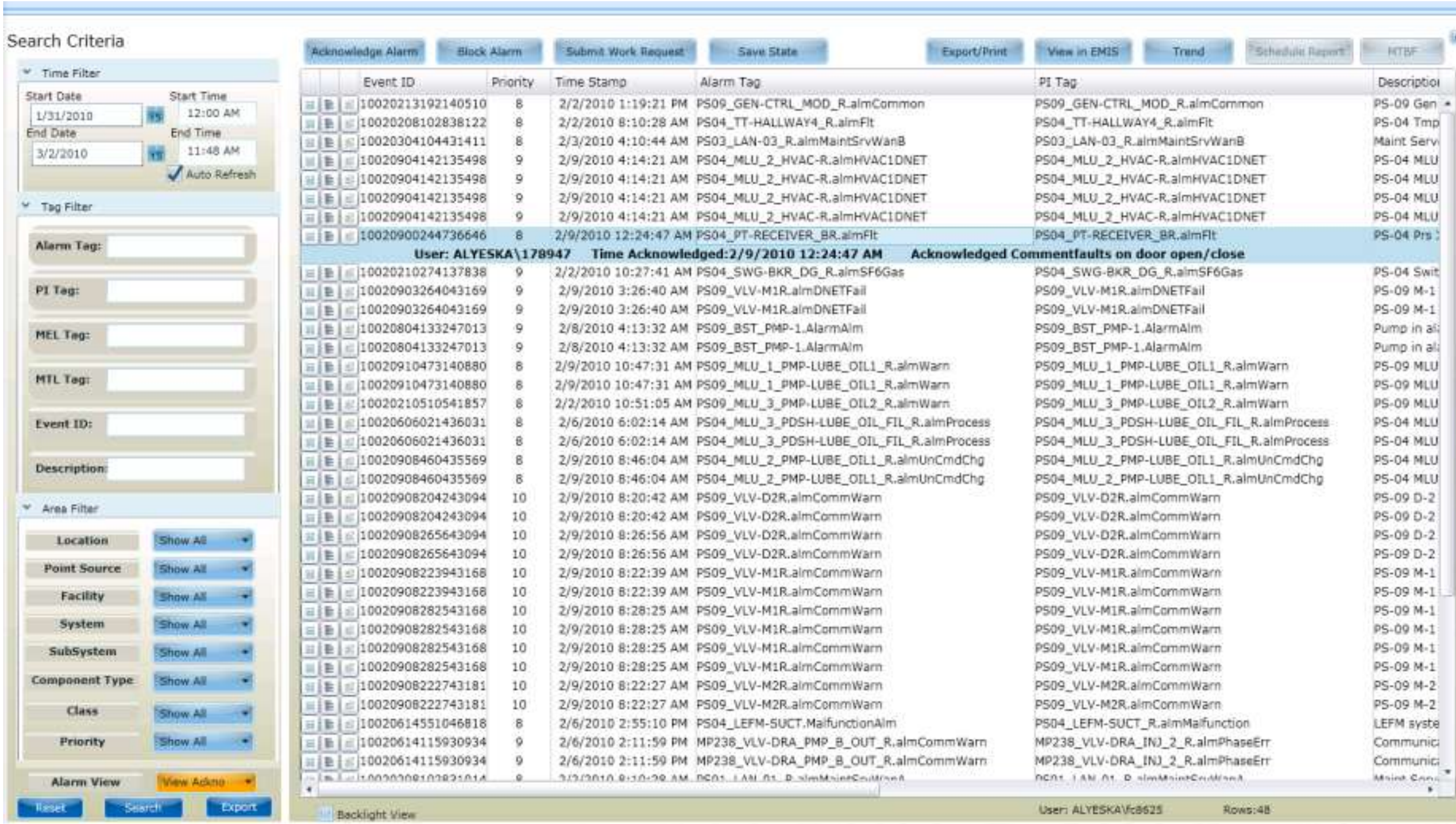




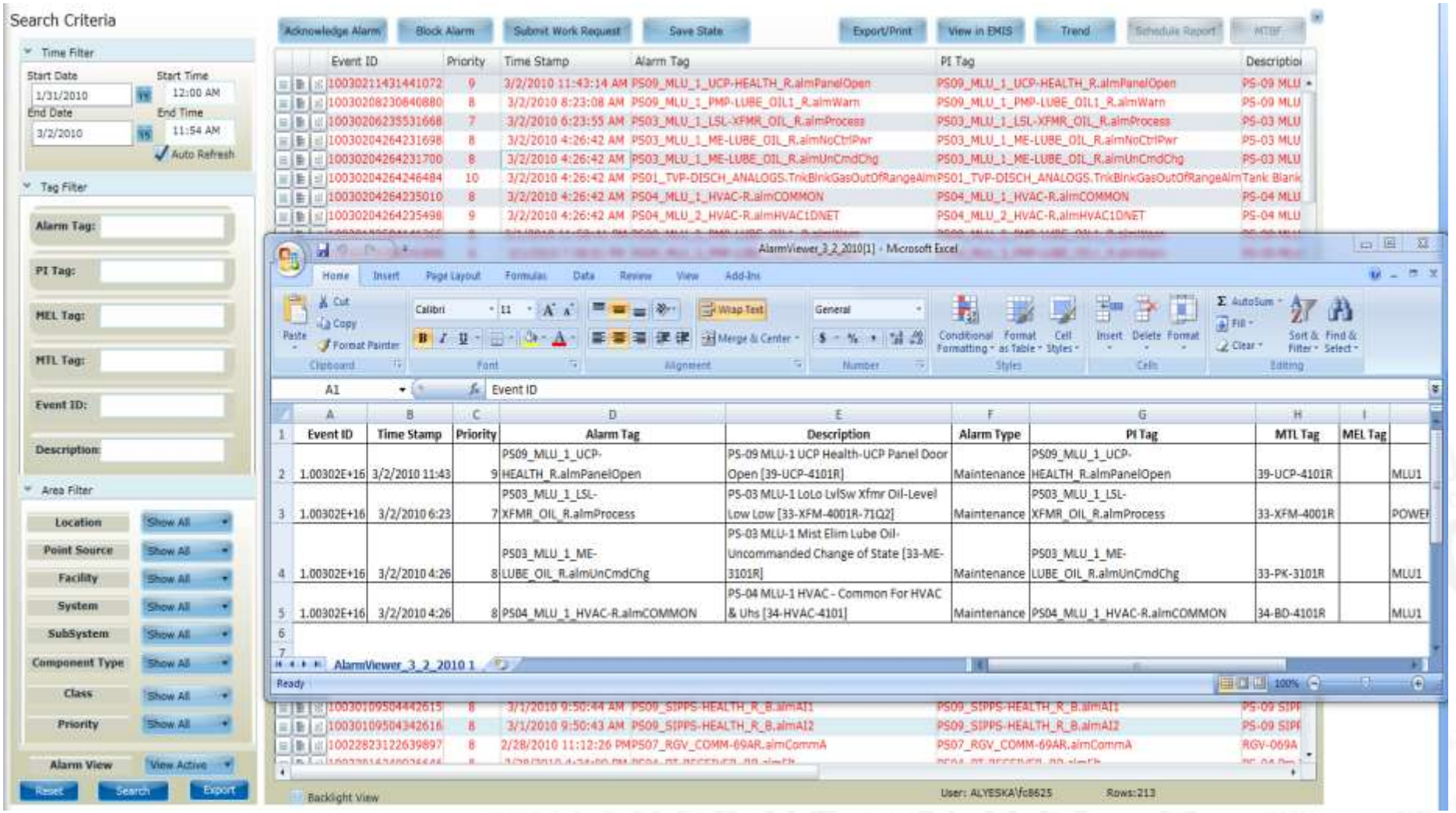


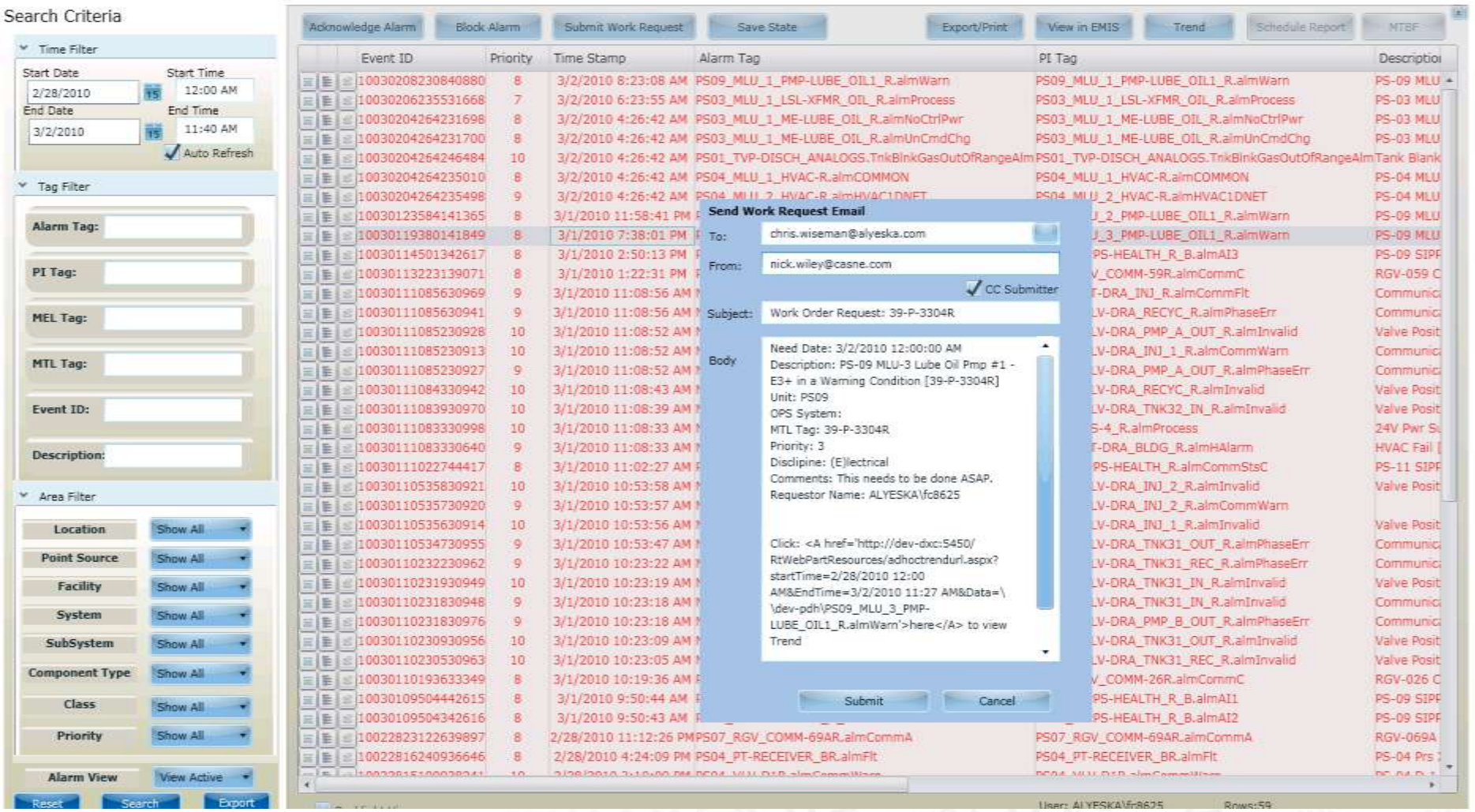


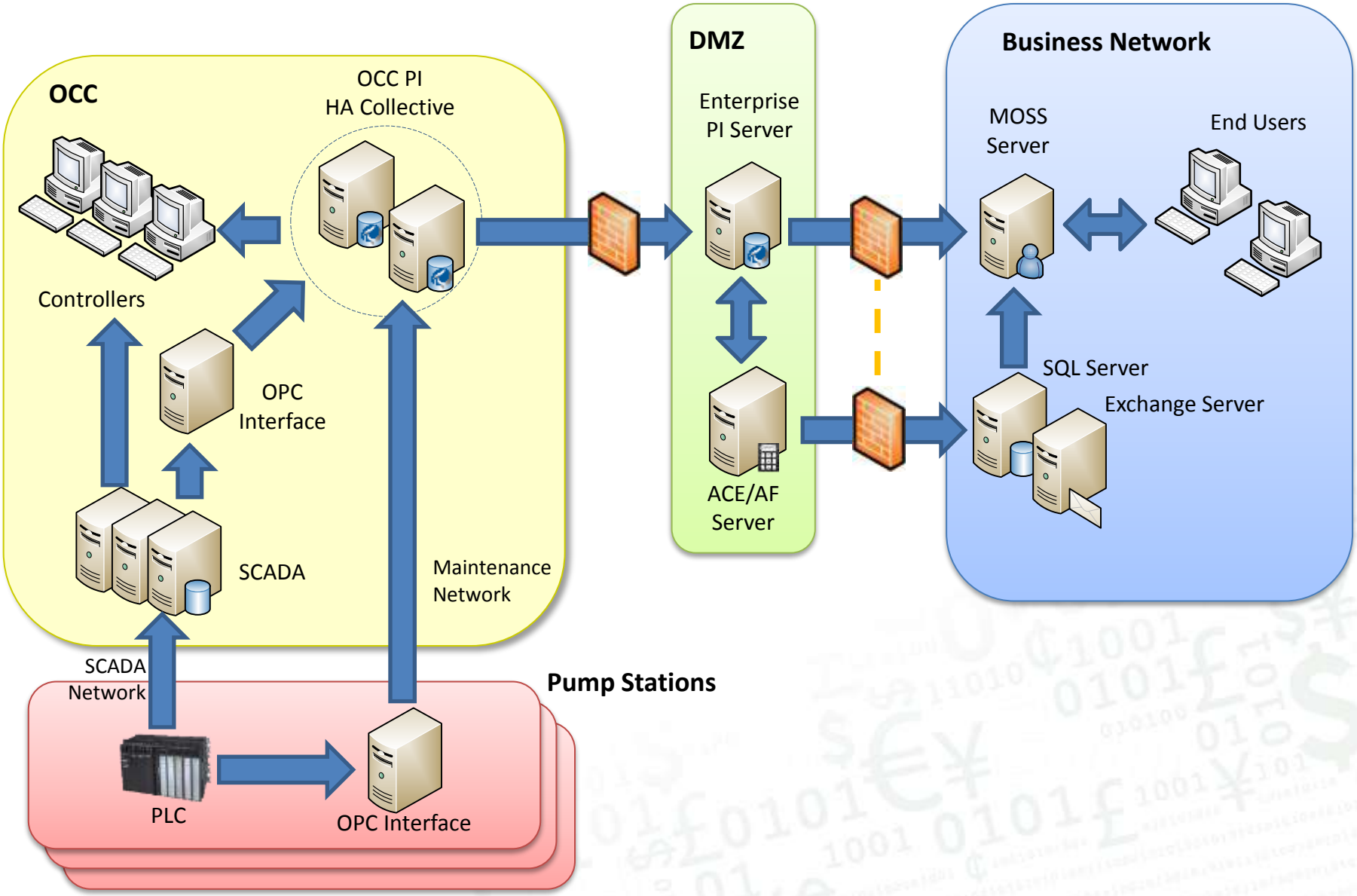




Event ID	Priority	Time Stamp	Alarm Tag	PI Tag	Description
10020213192140510	8	2/2/2010 1:19:21 PM	PS09_GEN-CTRL_MOD_R.almCommon	PS09_GEN-CTRL_MOD_R.almCommon	PS-09 Gen
10020208102838122	8	2/2/2010 8:10:28 AM	PS04_TT-HALLWAY4_R.almFlt	PS04_TT-HALLWAY4_R.almFlt	PS-04 Tmp
10020304104431411	8	2/3/2010 4:10:44 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 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 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



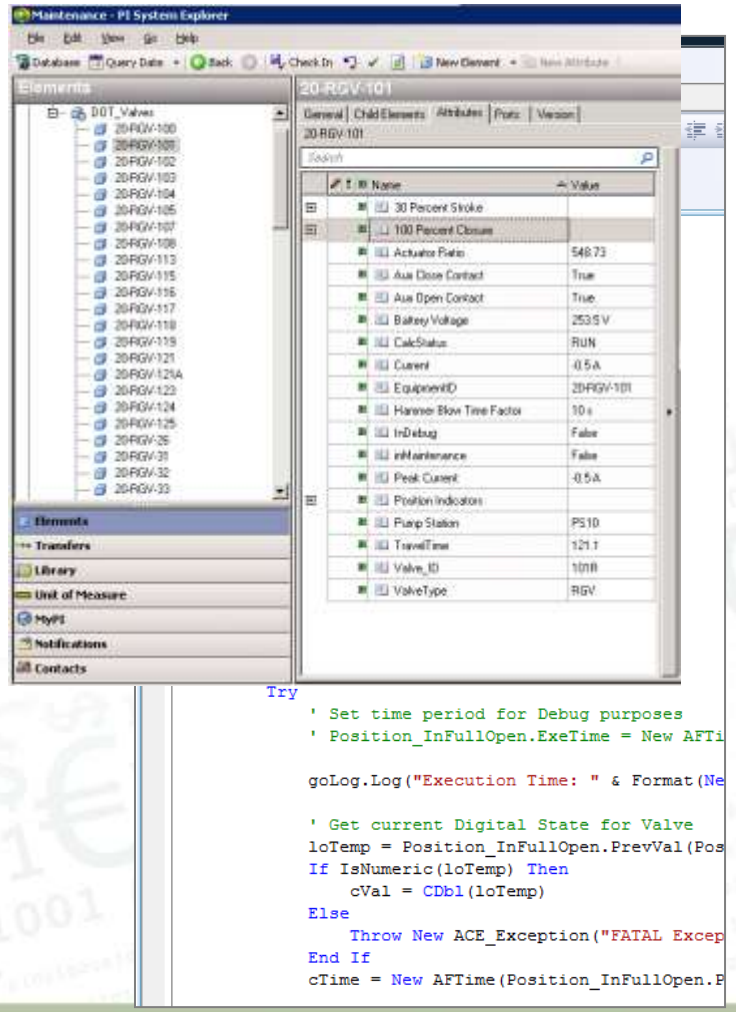




System Need	Solution
Real-time Data Storage	**PI Enterprise Server**
Relational Data Storage	Microsoft SQL Server
System Modeling	**Asset Framework (AF)**
Continuous Monitoring Algorithms	**Advanced Computing Engine** **Asset Framework (AF)** Casne .NET Code Assemblies
Alarm & Event Notifications	**Asset 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



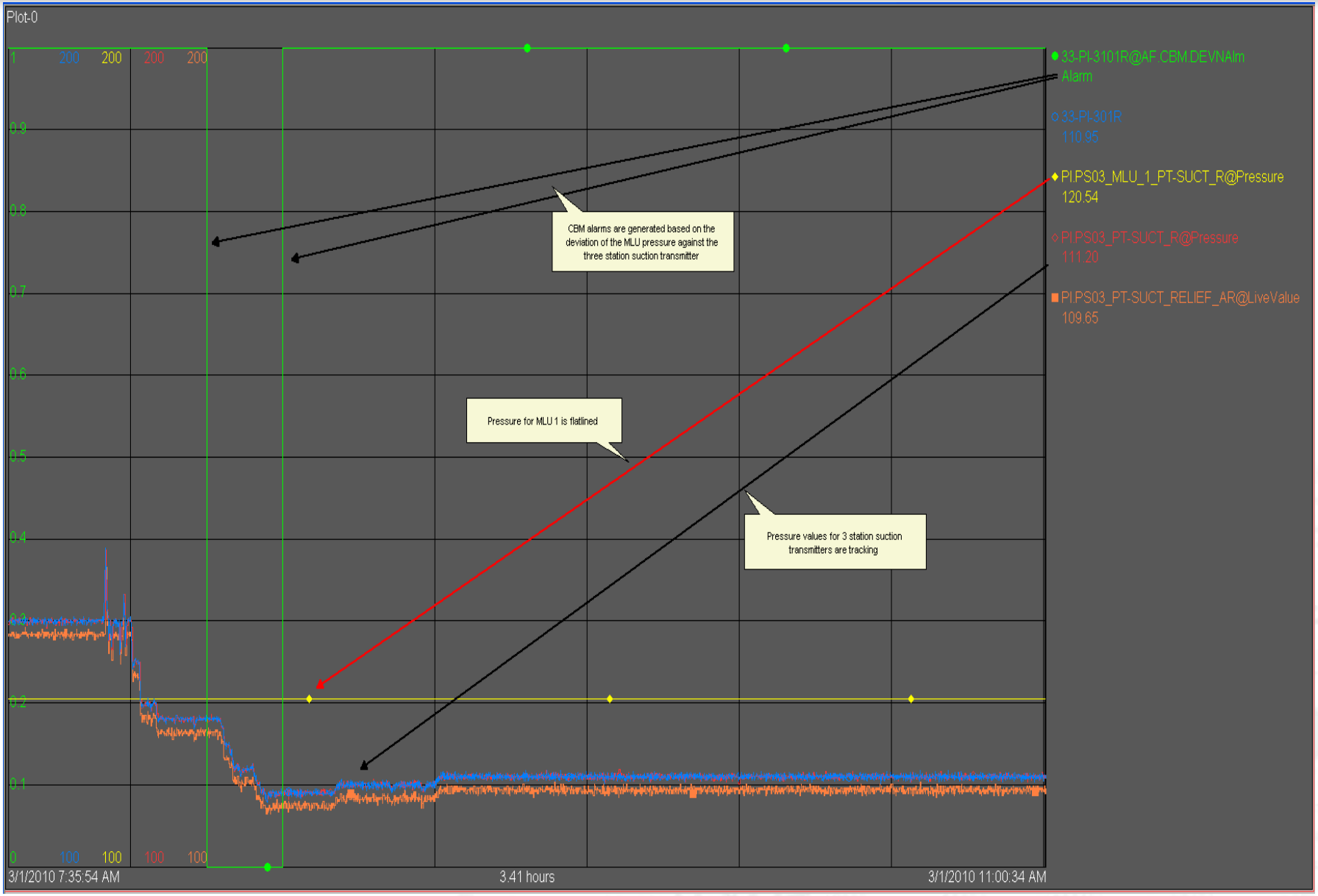
Microsoft Office SharePoint Server & PI WebParts

- 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

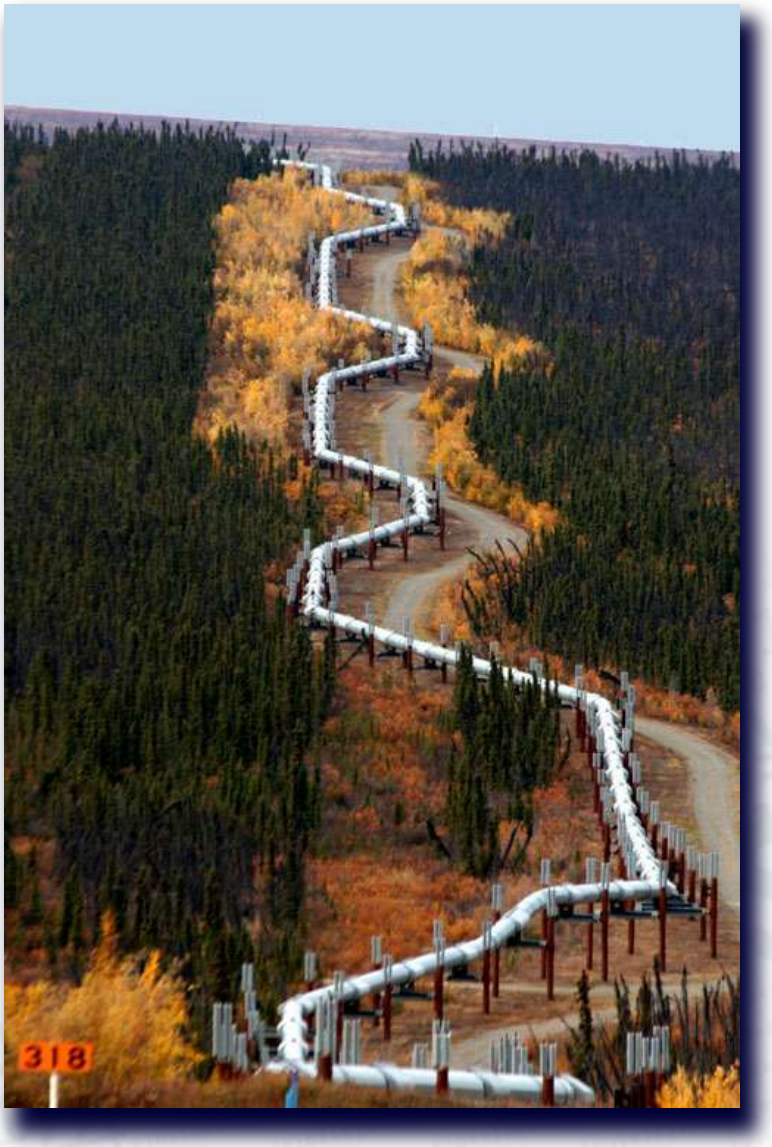


TANGIBLE BENEFITS

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



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

Welcome Chandler, Robert W | My Site | My Links |

Maintenance & Diagnostics Center

This Site: Maintenance & Diagr

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

View All Site Content

Engineering

Environment

Maintenance & Diagnostics Center

Elements

- MDRC
  - PS01
    - CPS
    - MLU
      - MLU1
      - MLU2
      - MLU3
    - TG
      - TG1
      - TG2
  - PS03
    - Ancillary
    - MLU
      - MLU1
      - MLU2
      - MLU3
    - TG
      - TG1
      - TG2
  - PS04
    - Ancillary
    - MLU
      - MLU1
      - MLU2
      - MLU3
    - TG
      - TG1
      - TG2
  - PS05
    - BSTR PMPS
    - Reiel
  - PS09
    - GVEA

STATUS SUMMARY

THREATS

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

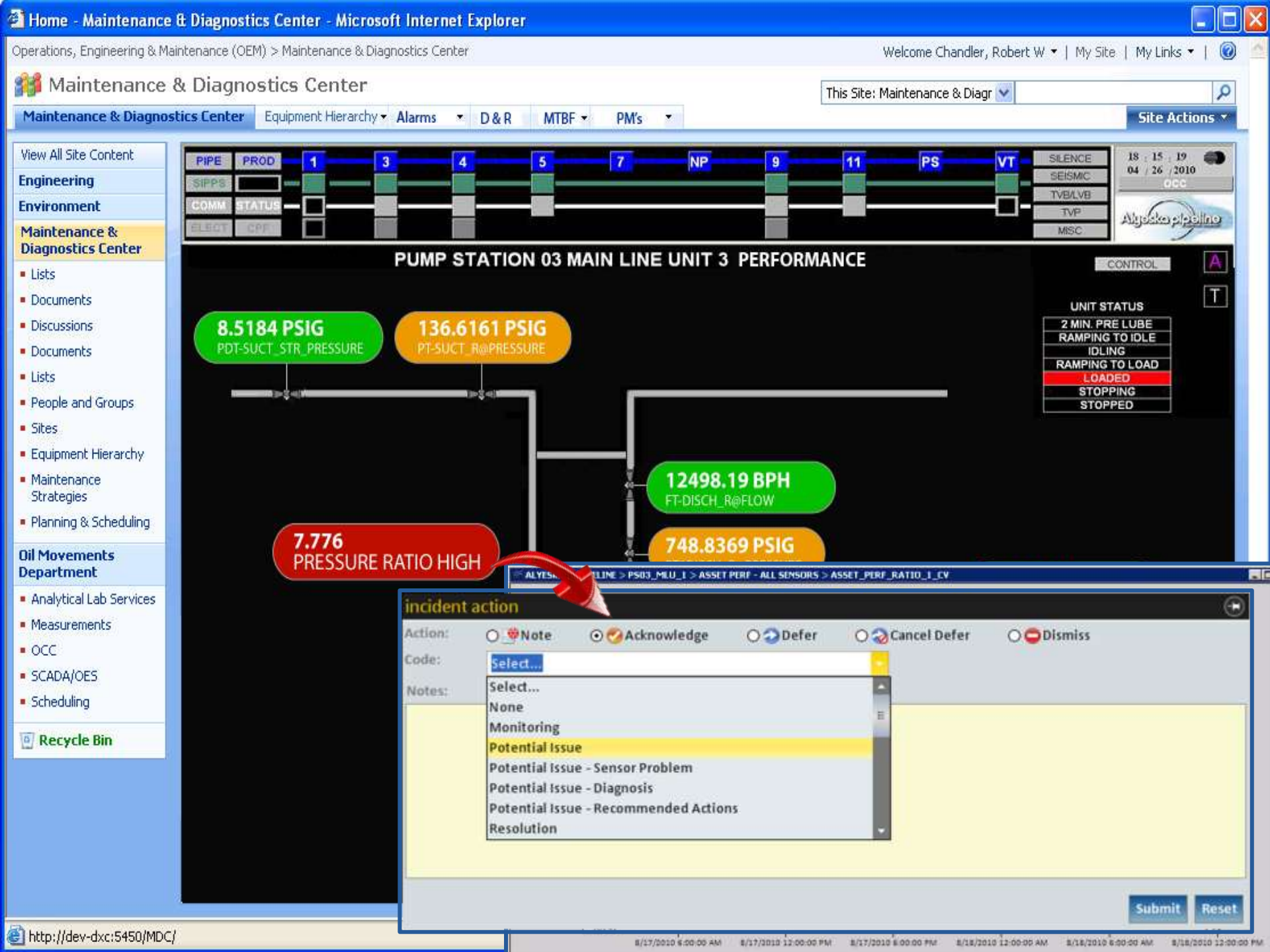
Event Time	Tag	Priority	Duration
5/24/2010 10:26	34-LI-3104R@AF.PBM.RORAlm	7	10 min
5/24/2010 06:54	33-LI-CRUDE_TNK_LVL@AF.CBM.DEVNAlm	7	12 min
5/24/2010 02:16	34-LI-3951R@AF.CBM.ENAlm	7	2 min
5/23/2010 22:05	39-LI-3304R@AF.PBM.RORAlm	7	1 min

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

http://dev-dxc:5450/MDC/

Local intranet


Home - Maintenance & Diagnostics Center - Microsoft Internet Explorer
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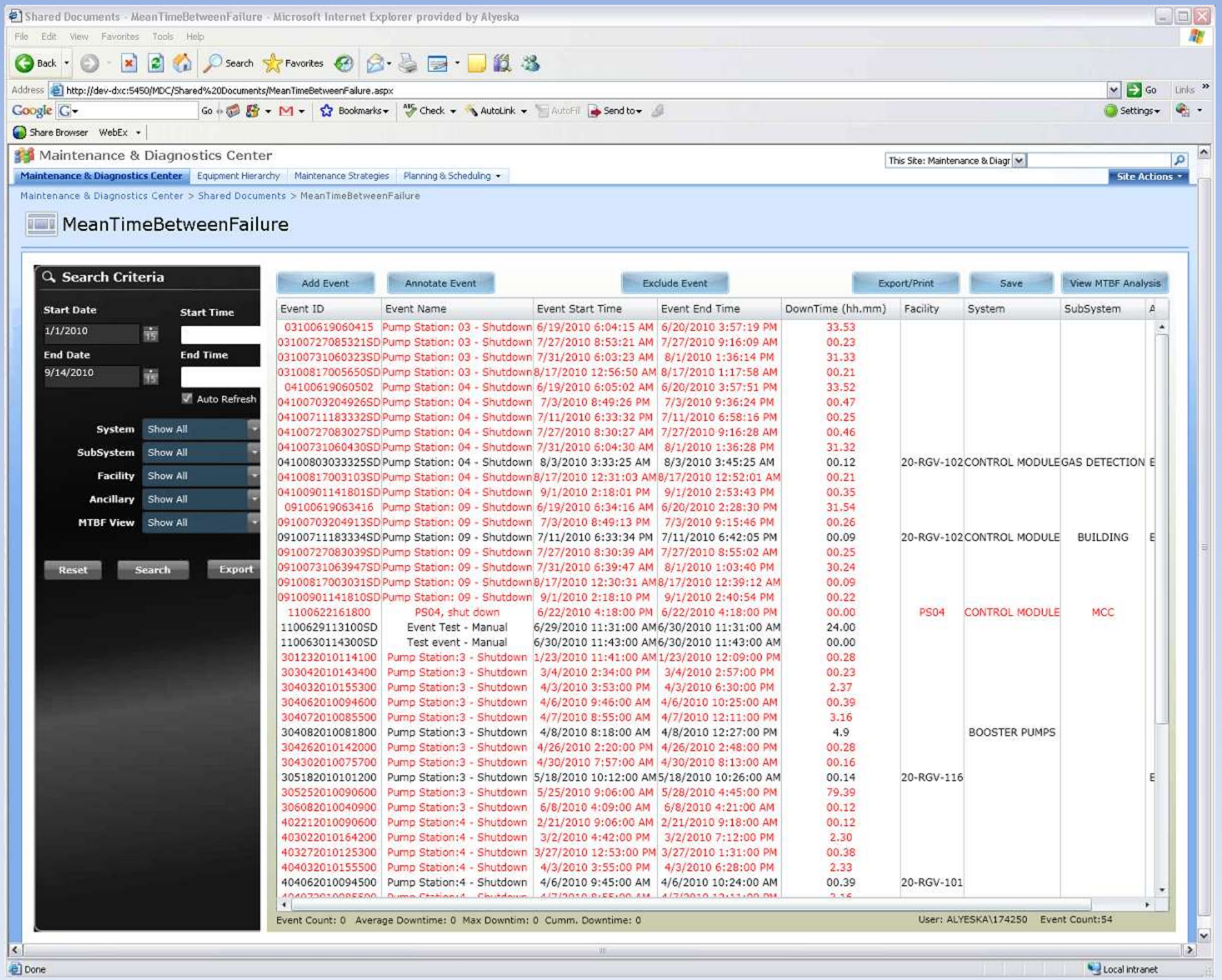
Welcome Chandler, Robert W | My Site | My Links
Maintenance & Diagnostics Center
This Site: Maintenance & Diagr
Maintenance & Diagnostics Center
Equipment Hierarchy
Alarms
D & R
MTBF
PM's
Site Actions
View All Site Content
Engineering
Environment
Maintenance & Diagnostics Center
Lists
Documents
Discussions
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
PIPE
PROD
SIPPS
COMM
STATUS
1
3
4
5
7
NP
9
11
PS
VT
SILENCE
SEISMIC
TVB/LVB
TVP
MISC
Alyeska pipeline
PUMP STATION 03 MAIN LINE UNIT 3 PERFORMANCE
CONTROL
A
T
UNIT STATUS
2 MIN. PRE LUBE
RAMPING TO IDLE
IDLING
RAMPING TO LOAD
LOADED
STOPPING
STOPPED
8.5184 PSIG
PDT-SUCT_STR_PRESSURE
136.6161 PSIG
PT-SUCT_R@PRESSURE
12498.19 BPH
FT-DISCH_R@FLOW
748.8369 PSIG
7.776
PRESSURE RATIO HIGH
ASSET PERF - ALL SENSORS > ASSET_PERF_RATIO_1_CV
incident action
Action:
Note
Acknowledge
Defer
Cancel Defer
Dismiss
Code:
Select...
Notes:
Select...
None
Monitoring
Potential Issue
Potential Issue - Sensor Problem
Potential Issue - Diagnosis
Potential Issue - Recommended Actions
Resolution
Submit
Reset
http://dev-dxc:5450/MDC/


Shared Documents - MeanTimeBetweenFailure - Microsoft Internet Explorer provided by Alyeska
File Edit View Favorites Tools Help
Back Search Favorites
Address http://dev-dxc:5450/MDC/Shared%20Documents/MeanTimeBetweenFailure.aspx
Go Links
Google Go Bookmarks Check AutoLink AutoFill Send to Settings
Share Browser WebEx
Maintenance & Diagnostics Center
This Site: Maintenance & Diagr
Maintenance & Diagnostics Center Equipment Hierarchy Maintenance Strategies Planning & Scheduling
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
04100803033325SD | 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
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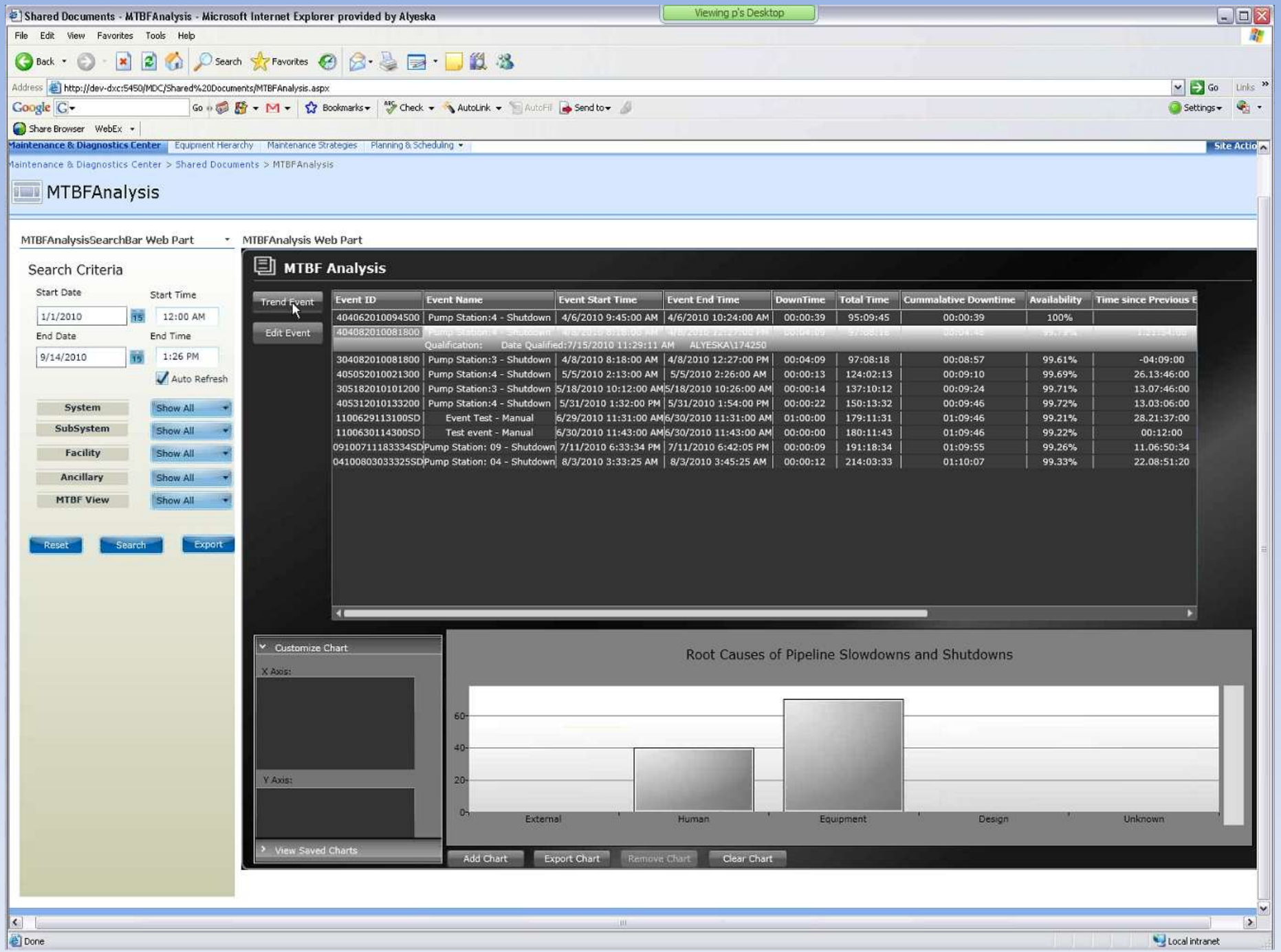
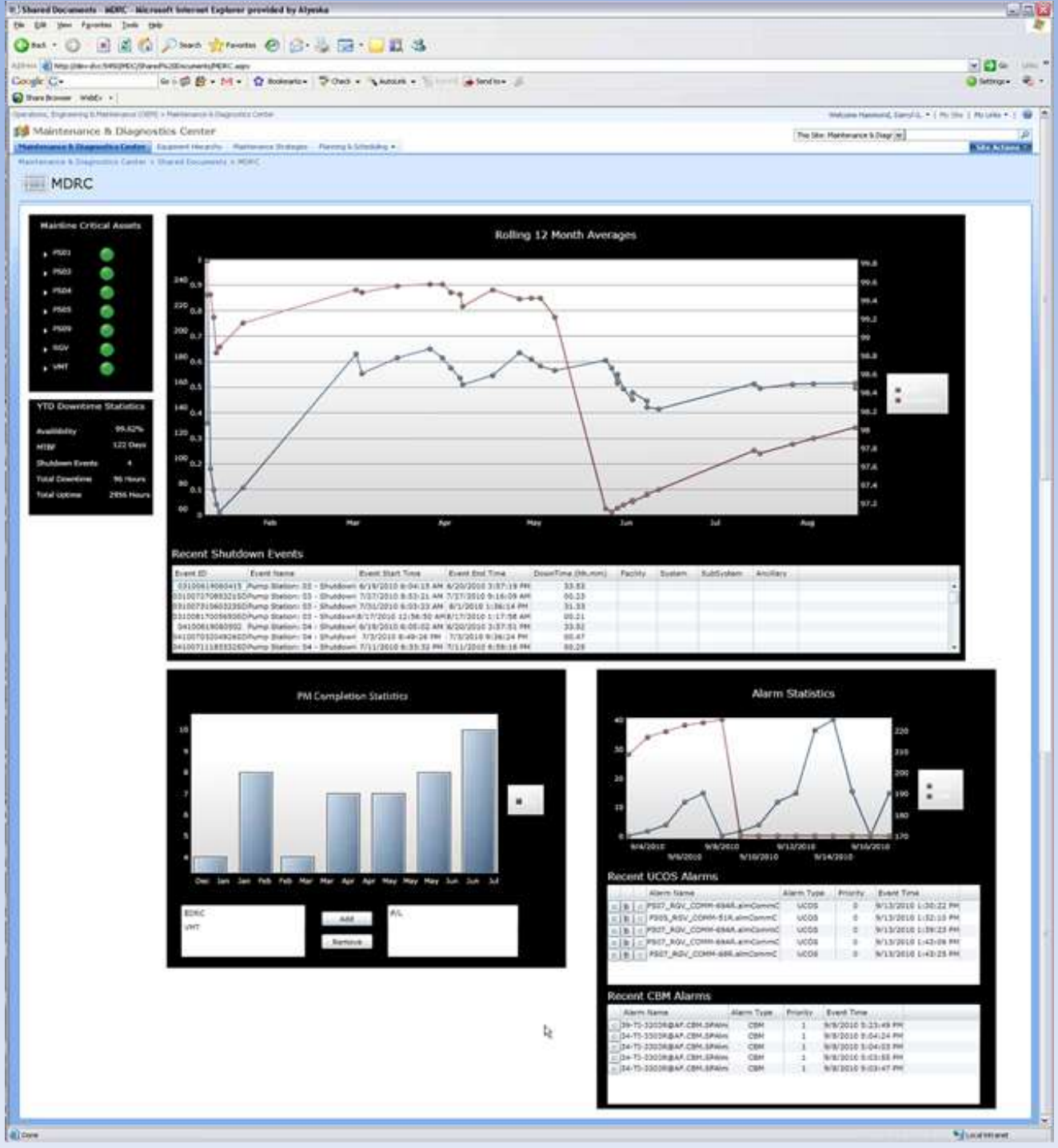
User: ALYESKA\174250 Event Count:54
Done
Local Intranet


Shared Documents - MTBFAnalysis - Microsoft Internet Explorer provided by Alyeska
Viewing p's Desktop
File Edit View Favorites Tools Help
Back Search Favorites
Address http://dev-dxc:5450/MDC/Shared%20Documents/MTBFAnalysis.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 Actio
Maintenance & Diagnostics Center > Shared Documents > MTBFAnalysis
MTBFAnalysis
MTBFAnalysisSearchBar Web Part
Search Criteria
Start Date
1/1/2010
Start Time
12:00 AM
End Date
9/14/2010
End Time
1:26 PM
Auto Refresh
System Show All
SubSystem Show All
Facility Show All
Ancillary Show All
MTBF View Show All
Reset Search Export
MTBFAnalysis Web Part
MTBF Analysis
Trend Event
Edit Event
Event ID | Event Name | Event Start Time | Event End Time | DownTime | Total Time | Cummalative 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
Qualification: Date Qualified:7/15/2010 11:29:11 AM ALYESKA\174250
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
60
40
20
0
External
Human
Equipment
Design
Unknown
Add Chart Export Chart Remove Chart Clear Chart
Done
Local intranet


Maintenance & Diagnostics Center
MDRC
Mainline Critical Assets
YTD Downtime Statistics
Availability 99.62%
MTBF 122 Days
Shutdown Events 4
Total Downtime 96 Hours
Total Uptime 2856 Hours
Rolling 12 Month Averages
Recent Shutdown Events
PM Completion Statistics
Alarm Statistics
Recent UCOS Alarms
Recent CBM Alarms

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