

Integration with Enterprise Business Systems Using PI Data Access

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RockTenn

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OSIsoft, LLC.



Day 1, Track2, 2:40-3:30.

Where PI geeks meet...

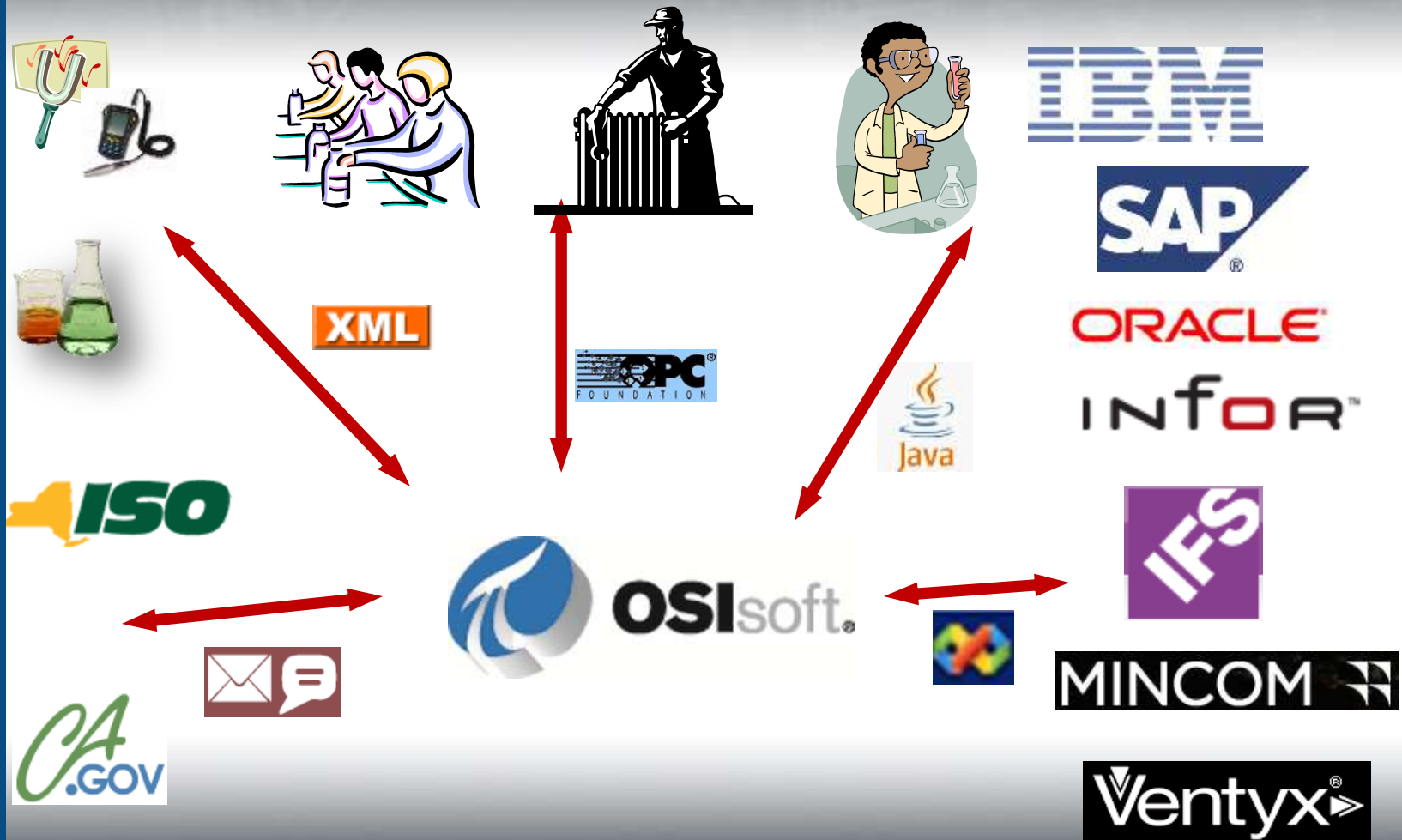
OSIsoft®

9/23/2010

Enterprise Integration and PI Data Access

Production Maintenance Quality

Compliance Reporting Lab Calibration



ERP and Asset Management Systems

PI Data Access

PI Web Services 2010



PI OLEDB Enterprise 2010

PI JDBC 2010

PI OPC



PI Notification - Delivery Channels



PI SDK, PI AF SDK, AN SDK



End User : PI System Access (PSA)

Developer: vCampus Subscription

Aspects of Enterprise Business Integration

Data



Events



Visualization



OSIsoft.



MINCOM

ORACLE

IBM



Push vs. Pull + optional Middleware

- PI Data/Events

- Push

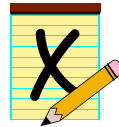


vs.

Pull



- None



- Microsoft BizTalk
 - SAP MII (and PCo)
 - IBM Websphere ESB
 - Oracle Fusion
 - TIBCO
 -



Use Cases and Demos

– Production Costing @



- PI Web Services + ACE

– Maximo CBM @



- PI Notif. → XML → jms queue (IBM Websphere)

– NY ISO reporting @ Renewable

- PI Notif. → XML → ftp



Production Costing @ RockTenn

Consumption - raw materials – grouped by RECIPES

ClO_2 (chlorine dioxide) - Tag

NaClO_3 (Sodium chlorate) - Tag

H_2SO_4 (Sulfuric Acid) - Tag

...

...

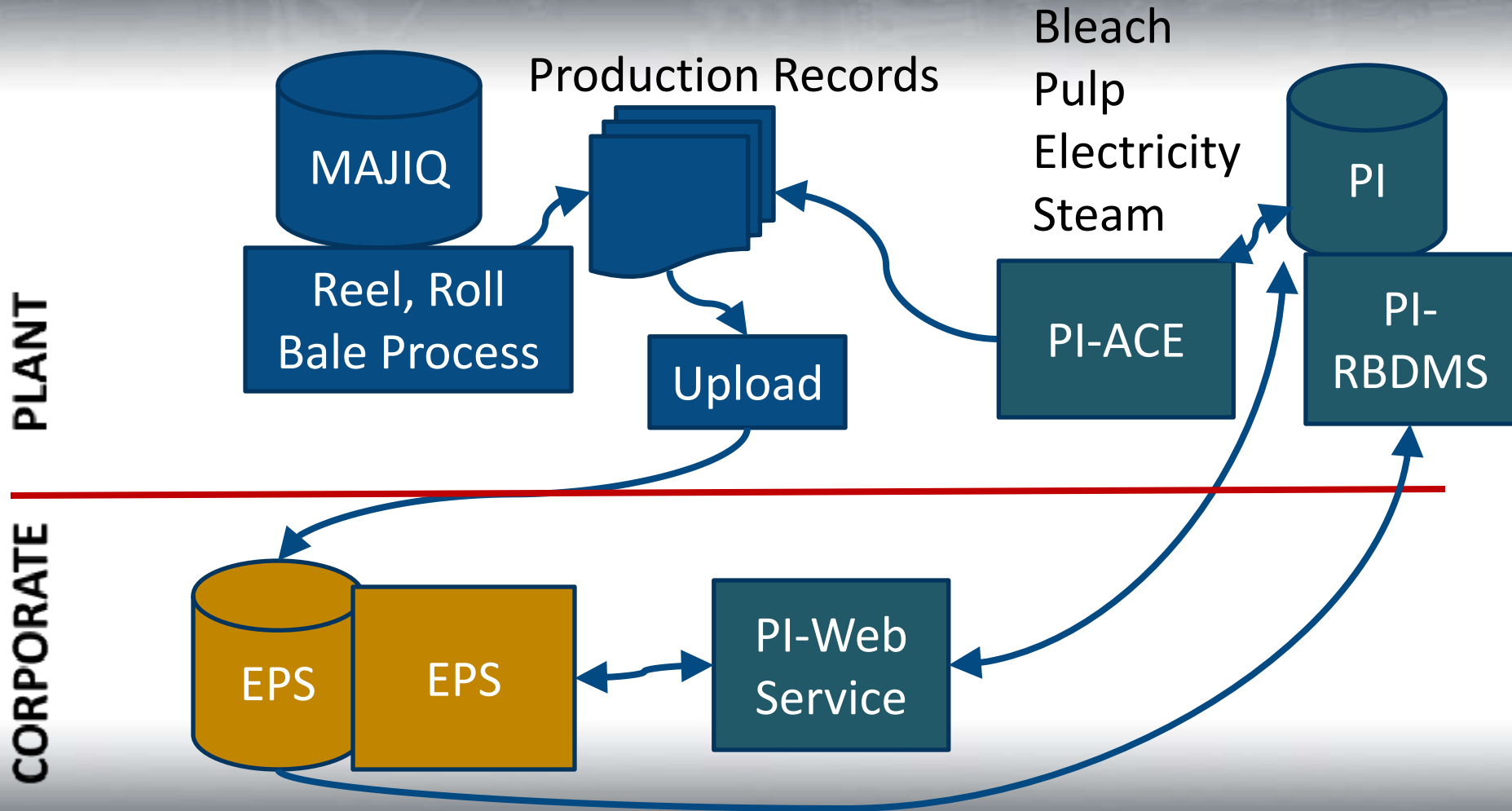
Production

Pulp

Utilities - Steam, Electricity, Bleach



Production Costing Integration



PI Web Services and PI ACE

PI Web Services

Summary call – time weighted

Reel Start time/End time

Get PI Tag list from Recipe

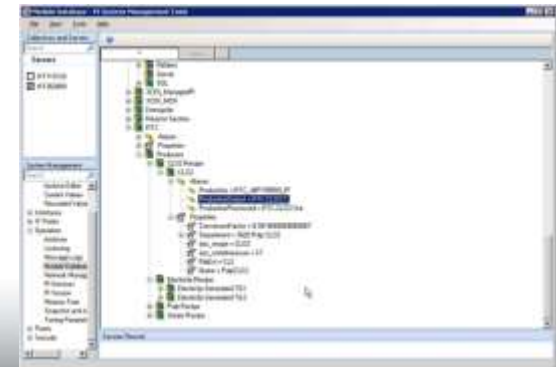


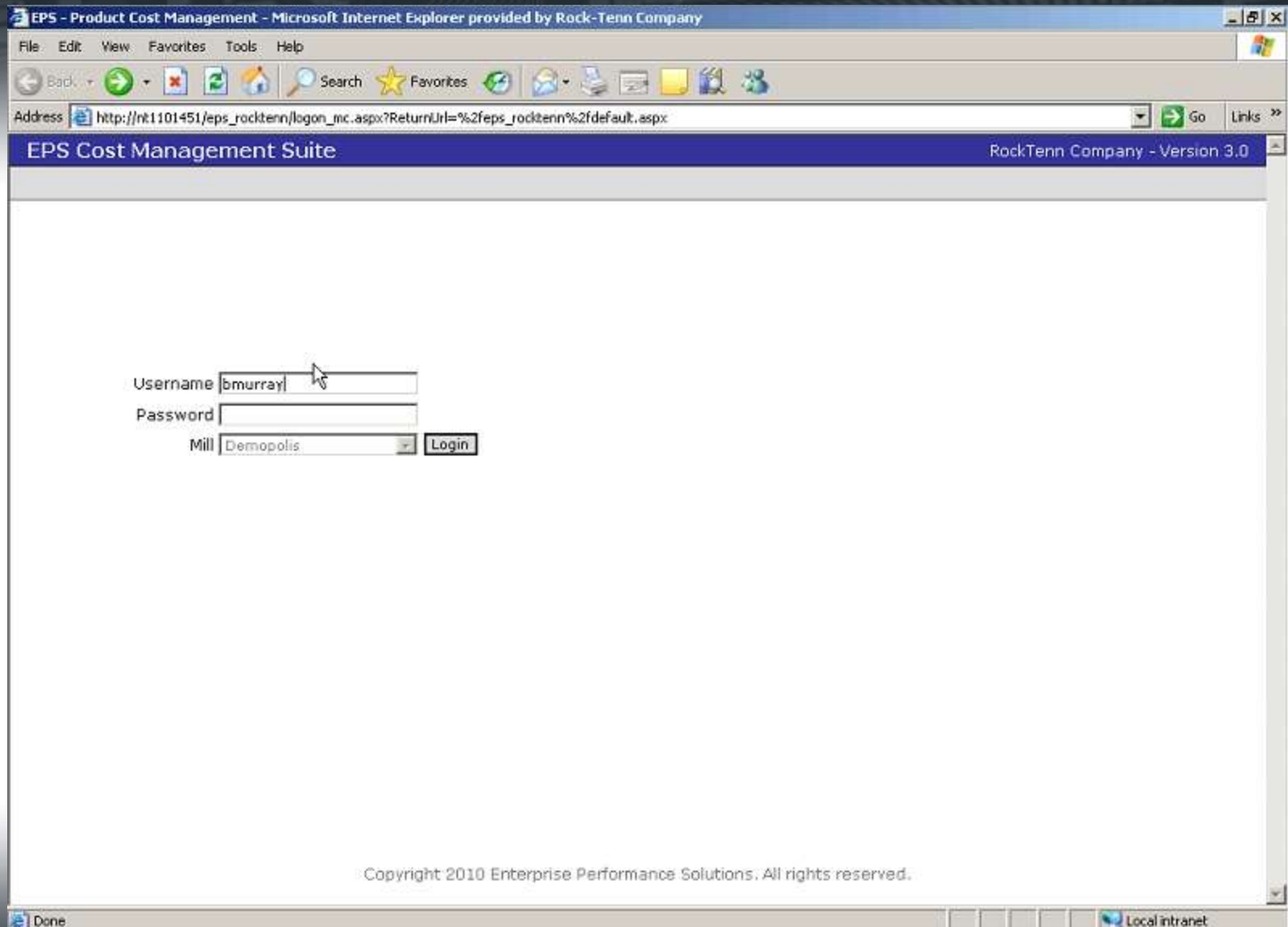
PI ACE – all continuous items

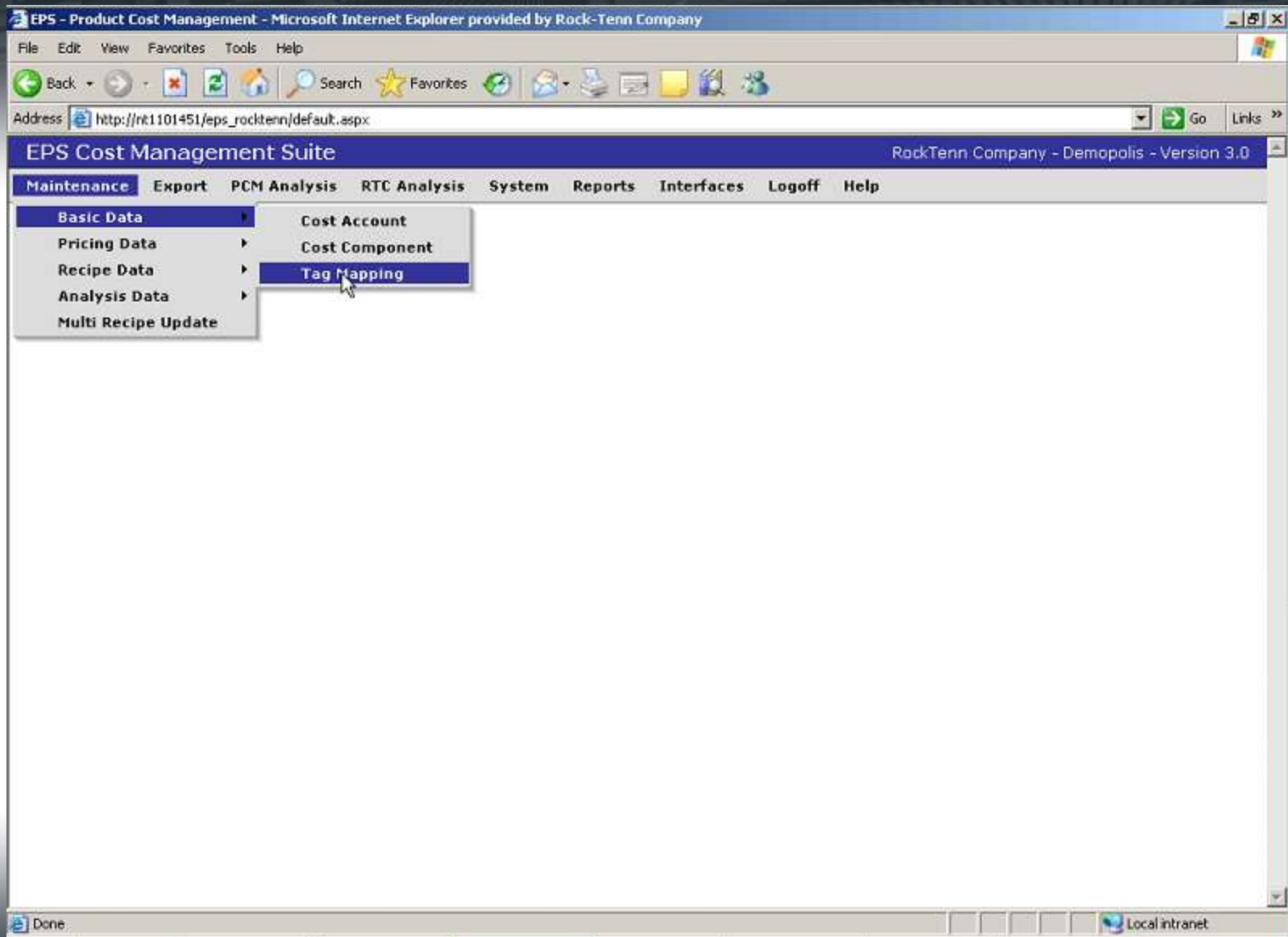
Hourly average

Steam 60#

Steam 150#







EPS - Product Cost Management - Microsoft Internet Explorer provided by Rock-Tenn Company

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address http://rk1101451/eps_rocktenn/TagMapping.aspx Go Links

EPS Cost Management Suite - Tag Mapping

RockTenn Company - Demopolis - Version 3.0

Maintenance Export PCM Analysis RTC Analysis System Reports Interfaces Logoff Help

1 / 4

Department: 0 - All Processes
 Description: 3620 ELEC TG2
 3620 EVAPORATION
 3620 LIME RECOVER
 3620 PULP BLEACH PL/
 3620 PULP BLEACH PL/
 3620 PULP CHIPS R&H
 3620 PULP CLO
 3620 PULP ENVIRON
 3620 PULP MILL
 3620 PULP W&S HW
 3620 PULP W&S SW

Search Column: Tag ID
 Search Text: Search

Recipe Name	Name	Department	Tag ID	UOM	Time Adjustment (MIN)
FC - ELECTRICITY FIXED COS		3620 ELEC TG1		H	0.0000
FC - ELECTRICITY FIXED COS		3620 ELEC TG2		H	0.0000
FUEL BARK BLEND		3620 STEAM PB1	\\WT362009\RTC_27FY10712_IC	KLB	0.0000
	55193 - Coal	3620 STEAM PB1	\\WT362009\RTC_27SY10713_IC	KLB	0.0000
	55192 - Natural Gas	3620 STEAM PB1	\\WT362009\RTC_27FY99006_IC	SCF	0.0000
	55194 - Oil	3620 STEAM PB1	\\WT362009\RTC_27FY10603_IC	LB	0.0000
	90002 - Condensate Water	3620 STEAM PB1	??????	GALLON	0.0000
DEMIN WATER		3620 STEAM PB1	\\WT362009\RTC_27FY99221A_IC	GALLON	0.0000
STEAM600 BLEND		3620 ELEC TG1	RTCxxd	KLB	0.0000
	FU008 - Steam 160 pound	3620 ELEC TG1	RTCxxe	KLB	0.0000
	FU007 - Steam 50 pound	3620 ELEC TG1	RTCxxf	KLB	0.0000
	90002 - Condensate Water	3620 ELEC TG1	RTCxxg	GALLON	0.0000
FUEL BARK BLEND		3620 STEAM PB3	\\WT362009\RTC_27FY30702_IC	KLB	0.0000
	55193 - Coal	3620 STEAM PB3	\\WT362009\RTC_27FY30804_IC	ST	0.0000
	55194 - Oil	3620 STEAM PB3	\\WT362009\RTC_27FY30503_IC	GALLON	0.0000
	90001 - Raw Water	3620 STEAM PB3	?????	GALLON	0.0000
DEMIN WATER		3620 STEAM PB3	\\WT362009\RTC_27FY99222A_IC	GALLON	0.0000
	55194 - Oil	3620 STEAM RECOVERY	\\WT362009\RTC_29FY99006_IC	LB	0.0000

Done Local intranet

Start 11 Microsoft... 4 Internet... Remote D... 3 Microsoft... 4 Windows... TestPIWeb.p... PI Web Servic... 2:17 PM

EPS - Product Cost Management - Microsoft Internet Explorer provided by Rock-Tenn Company

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites RSS Feeds Print Mail

Address http://rt1101451/eps_rocktenn/TagMapping.aspx Go Links »

EPS Cost Management Suite - Tag Mapping

RockTenn Company - Demopolis - Version 3.0

Maintenance Export PCM Analysis RTC Analysis System Reports Interfaces Logoff Help

1 / 1

Department: **3620 PULP BLEACH PL** Search Column: Tag ID

Description: Search Text:

Recipe Name	Cost Component Name	Department	Tag ID	UOM	Time Adjustment (MIN)
FC - BPHW		3620 PULP BLEACH PLANT HW		H	0.0000
CLO2		3620 PULP BLEACH PLANT HW	\\NT362009\RTC_47FY99430A_IC	LB	0.0000
	51091 - Sulfuric Acid	3620 PULP BLEACH PLANT HW	\\NT362009\RTC_47FY99431A_IC	LB	0.0000
	51091 - Caustic Soda Membrane	3620 PULP BLEACH PLANT HW	\\NT362009\RTC_47FY99432A_IC	LB	0.0000
	51091 - Magnesium Hydroxide	3620 PULP BLEACH PLANT HW	\\NT362009\RTC_47FY99435A_IC	LB	0.0000
	51091 - Hydrogen Peroxide	3620 PULP BLEACH PLANT HW	\\NT362009\RTC_47FY99433A_IC	LB	0.0000
	51091 - Oxygen	3620 PULP BLEACH PLANT HW	\\NT362009\RTC_47FY99434A_IC	LB	0.0000
	FU007 - Steam 50 pound	3620 PULP BLEACH PLANT HW	\\NT362009\RTC_47FY1200_IC	KLB	0.0000
	FU008 - Steam 160 pound	3620 PULP BLEACH PLANT HW	\\NT352009\RTC_47FY1201_IC	KLB	0.0000

Done

Start 11 Microsoft... 4 Internet... Remote D... 3 Microsoft... 4 Windows... TestPIWeb.p... PI Web Servic... Local intranet 2:19 PM

Microsoft Excel - TestOutput.xls

File Edit View Insert Format Tools Data Window PI P1-SMT Help

Type a question for help

C42

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	NT362009														
2		RTC_48FY99500_IP	RTC_45FY99500_IP	RTC_45FY99500_IP											
3		0.042	0.042	0.042				0.0416666666666667							
4		CLO2	HW UnB	SW UnB											
5	8/23/2010 6:30	0.634	33.278	16.066	100										
6	8/23/2010 7:30	0.317	33.295	16.066	100										
7	8/23/2010 8:30	1.095	33.502	16.066	100										
8	8/23/2010 9:30	1.098	33.528	16.066	100										
9	8/23/2010 10:30	1.109	33.318	16.066	100										
10	8/23/2010 11:30	1.102	33.429	16.066	100										
11	8/23/2010 12:30	1.141	33.504	16.066	100										
12	8/23/2010 13:30	1.070	32.155	16.066	100										
13	8/23/2010 14:30	1.044	28.418	16.066	100										
14	8/23/2010 15:30	0.991	27.158	17.116	100										
15	8/23/2010 16:30	1.016	28.159	17.502	100										
16	8/23/2010 17:30	1.042	29.007	17.548	100										
17	8/23/2010 18:30	1.057	29.837	17.575	100										
18	8/23/2010 19:30	1.039	30.738	16.971	100										
19	8/23/2010 20:30	1.047	30.744	16.994	100										
20	8/23/2010 21:30	0.944	31.040	17.028	100										
21	8/23/2010 22:30	0.904	31.033	16.971	100										
22	8/23/2010 23:30	0.877	30.736	16.988	100										
23	8/24/2010 0:30	0.946	30.820	16.952	100										
24	8/24/2010 1:30	0.849	30.628	16.885	100										
25	8/24/2010 2:30	0.822	31.076	16.930	100										
26	8/24/2010 3:30	0.816	30.730	16.927	100										
27	8/24/2010 4:30	0.781	29.410	16.984	100										
28	8/24/2010 5:30	0.784	28.706	16.949	100										
29	8/24/2010 6:30	0.795	28.183	17.615	100										

Sheet1 / Aliases / ProducerTags / Hourly / Sheet4 / data /

Ready Calculate

3620PulpCLO2_20100824_0730-0830.CL2 - Notepad

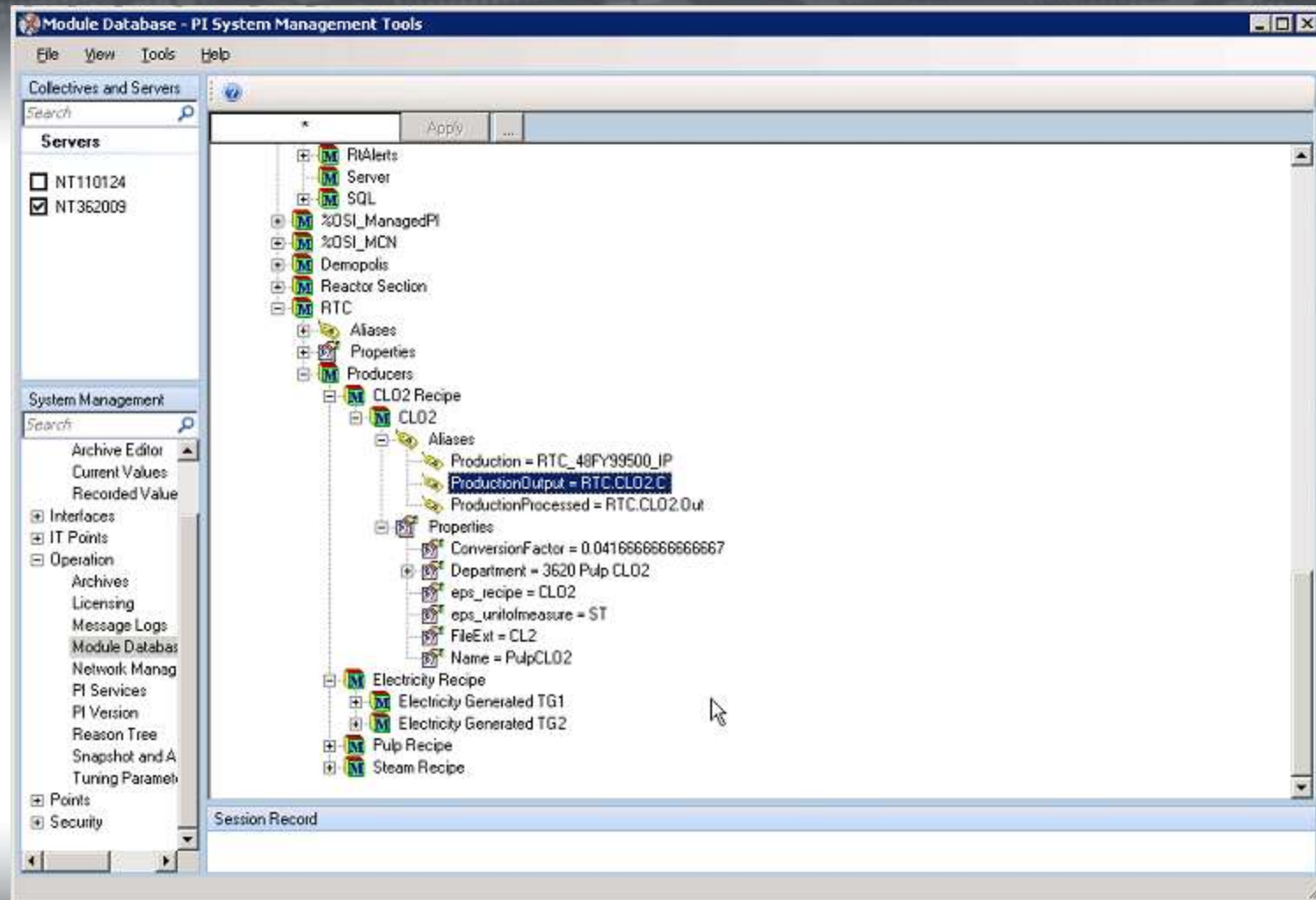
```
File Edit Format View Help
Demopolis,3620PulpCLO2_20100824_0730-0830,3620PulpCLO2_20100824,CL02,1,0.78758798437
538,ST,0,8/24/2010 7:30:00 AM,8/24/2010 8:30:00 AM,1,0,CLO2,0
```

Microsoft Excel - SteamwithFields.xls

Type a question for help

F24

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	COMPANY	NAME	ORDER_NAME	RECIPE	SHIFT	QUANTITY	UOM	WA	START TIME	END TIME	RUN/DOWN	DUCTION	PROCESS	
2	Demopolis	3620PulpCLO2_20100824_1230-1330	3620PulpCLO2_20100824	CLO2	1	1.019268	ST	0	8/24/2010 12:30	8/24/2010 13:30	1	0	CLO2	0
3														
4														
5														
6														
7														
8														
9														
10														



Microsoft Excel - OutputTags.xls								
File Edit View Insert Format Tools Data Window PI PI-SMT Help								
Type a question for help								
B22 {=PINCompDat(B\$20,B\$18,B\$19,1,B\$17,"inside")}								
	A	B	C	D	E	F	G	H
4		RTC.ELECTRICITY GENERATED TG2.C		RTC.ELECTRICITY GENERATED TG1.C		RTC.Steam600 PB3.C		RTC.SteamE
5								
6		11-Aug-10 17:30:00	10.92082882	09-Aug-10 08:30:01	15302.12207	11-Aug-10 20:30:00	591.2143555	05-Aug-10 1
7		11-Aug-10 16:30:00	10.91445827	09-Aug-10 07:30:01	15101.50977	11-Aug-10 19:30:00	603.5883179	05-Aug-10 1
8		11-Aug-10 15:30:00	10.910779	09-Aug-10 06:30:01	15861.42969	11-Aug-10 18:30:00	595.3572998	05-Aug-10 C
9		11-Aug-10 14:30:00	10.90502071	09-Aug-10 05:30:01	15970.46289	11-Aug-10 17:30:00	600.298584	05-Aug-10 C
10		11-Aug-10 13:30:00	10.90262508	09-Aug-10 04:30:01	15447.14746	11-Aug-10 16:30:00	603.2254639	05-Aug-10 C
11		11-Aug-10 12:30:00	10.90367508	09-Aug-10 03:30:01	13996.31641	11-Aug-10 15:30:00	603.9202881	05-Aug-10 C
12		11-Aug-10 11:30:00	10.88504982	09-Aug-10 02:30:00	12582.8457	11-Aug-10 14:30:00	602.5623779	05-Aug-10 C
13		11-Aug-10 10:30:00	10.89313316	09-Aug-10 01:30:00	13113.07227	11-Aug-10 13:30:00	605.954895	05-Aug-10 C
14		11-Aug-10 09:30:00	10.89758301	09-Aug-10 00:30:00	12981.5791	11-Aug-10 12:30:00	610.6920776	05-Aug-10 C
15		11-Aug-10 08:30:00	10.90346622	08-Aug-10 23:30:00	11318.21387	11-Aug-10 11:30:00	610.7374878	05-Aug-10 C
16		25200						
17		NT362009		NT362009		NT362009		NT362009
20		RTC.CLO2.C		RTC.HW PULP BLEACHED.C		RTC.HW PULP UNBLEACHED.C		RTC.SW PU
21								
22		24-Aug-10 15:30:00	0.98261255	05-Aug-10 11:30:00	128.7669067	24-Aug-10 15:30:00	35.77480316	05-Aug-10 1
23		24-Aug-10 14:30:00	1.006392479	05-Aug-10 10:30:00	146.9389954	24-Aug-10 14:30:00	34.84963608	05-Aug-10 1
24		24-Aug-10 13:30:00	1.019267917	05-Aug-10 09:30:00	155.8594818	24-Aug-10 13:30:00	34.56515167	05-Aug-10 C
25		24-Aug-10 12:30:00	1.03145647	05-Aug-10 08:30:00	157.3191071	24-Aug-10 12:30:00	34.42949295	05-Aug-10 C
26		24-Aug-10 11:30:00	0.922239304	05-Aug-10 07:30:00	145.8415527	24-Aug-10 11:30:00	33.09850311	05-Aug-10 C
27		24-Aug-10 10:30:00	0.882983148	05-Aug-10 06:30:00	140.3493042	24-Aug-10 10:30:00	30.33358765	05-Aug-10 C
28		24-Aug-10 09:30:00	0.871730685	05-Aug-10 05:30:00	146.8390961	24-Aug-10 09:30:00	28.37509155	05-Aug-10 C
29		24-Aug-10 08:30:00	0.787588	05-Aug-10 04:30:00	151.8379517	24-Aug-10 08:30:00	28.0692482	05-Aug-10 C
30		24-Aug-10 07:30:00	0.795027137	05-Aug-10 03:30:00	110.3089294	24-Aug-10 07:30:00	28.2023201	05-Aug-10 C
31		24-Aug-10 06:30:00	0.784061432	05-Aug-10 02:30:00	71.18681335	24-Aug-10 06:30:00	28.71196938	05-Aug-10 C
32								
33		NT362009		NT362009		NT362009		NT362009
36		RTC.ELECTRICITY GENERATED TG2.OUT		RTC.ELECTRICITY GENERATED TG1.OUT		RTC.Steam600 PB3.OUT		RTC.SteamE
37								
38		11-Aug-10 20:30:00	Errors:The specified pat	05-Aug-10 15:54:19	Pt Created	11-Aug-10 20:30:00	Completed Record through 8/11/20	12-Aug-10 1
39		11-Aug-10 19:30:00	Errors:The specified pat			11-Aug-10 19:30:00	Completed Record through 8/11/20	12-Aug-10 C
40		11-Aug-10 18:30:00	Errors:The specified pat			11-Aug-10 18:30:00	Completed Record through 8/11/20	12-Aug-10 C
41		11-Aug-10 17:30:00	Completed Record throu			11-Aug-10 17:30:00	Completed Record through 8/11/20	12-Aug-10 C
42		11-Aug-10 16:30:00	Completed Record throu			11-Aug-10 16:30:00	Completed Record through 8/11/20	12-Aug-10 C
OutputTags data create Alias Sheet2 Sheet1 Alias								
Ready Calculate								

Ready Calculate

Microsoft Excel - OutputTags.xls

File Edit View Insert Format Tools Data Window PI PI-SMT Help

Type a question for help

B54 (=PINCompDat(B\$52,B\$50,B\$51,1,B\$49,"inside"))

	A	B	C	D	E	F	G	H
30		24-Aug-10 07:30:00	0.795027137	05-Aug-10 03:30:00	110.3089294	24-Aug-10 07:30:00	28.2023201	05-Aug-10 C
31		24-Aug-10 06:30:00	0.784061432	05-Aug-10 02:30:00	71.18681335	24-Aug-10 06:30:00	28.71196938	05-Aug-10 C
32								
33		NT362009		NT362009		NT362009		NT362009
36		RTC.ELECTRICITY GENERATED TG2.OUT		RTC.ELECTRICITY GENERATED TG1.OUT		RTC.Steam600 PB3.OUT		RTC.Steam6
37								
38		11-Aug-10 20:30:00	Errors:The specified pat	05-Aug-10 15:54:19	Pt Created	11-Aug-10 20:30:00	Completed Record through 8/11/20	12-Aug-10 1
39		11-Aug-10 19:30:00	Errors:The specified pat			11-Aug-10 19:30:00	Completed Record through 8/11/20	12-Aug-10 C
40		11-Aug-10 18:30:00	Errors:The specified pat			11-Aug-10 18:30:00	Completed Record through 8/11/20	12-Aug-10 C
41		11-Aug-10 17:30:00	Completed Record throu			11-Aug-10 17:30:00	Completed Record through 8/11/20	12-Aug-10 C
42		11-Aug-10 16:30:00	Completed Record throu			11-Aug-10 16:30:00	Completed Record through 8/11/20	12-Aug-10 C
43		11-Aug-10 15:30:00	Completed Record throu			11-Aug-10 15:30:00	Completed Record through 8/11/20	12-Aug-10 C
44		11-Aug-10 14:30:00	Completed Record throu			11-Aug-10 14:30:00	Completed Record through 8/11/20	12-Aug-10 C
45		11-Aug-10 13:30:00	Completed Record throu			11-Aug-10 13:30:00	Completed Record through 8/11/20	05-Aug-10 1
46		11-Aug-10 12:30:00	Completed Record throu			11-Aug-10 12:30:00	Completed Record through 8/11/20	
47		11-Aug-10 11:30:00	Completed Record throu			11-Aug-10 11:30:00	Completed Record through 8/11/20	
48								
49		NT362009		NT362009		NT362009		NT362009
50		*		*		*		*
51		-20		-10		-10		
52		RTC.CLO2.OUT		RTC.HW PULP BLEACHED.OUT		RTC.HW PULP UNBLEACHED.OUT		RTC.SW PU
53								
54		24-Aug-10 15:30:00	Completed Processing a	05-Aug-10 15:54:19	Pt Created	23-Aug-10 09:30:00	Completed Processing at 8/23/201	05-Aug-10 1
55		24-Aug-10 14:30:00	Completed Processing a			23-Aug-10 08:30:00	Completed Record through 8/23/20	
56		24-Aug-10 13:30:00	Completed Processing a			23-Aug-10 07:30:00	Completed Record through 8/23/20	
57		24-Aug-10 12:30:00	Completed Processing a			23-Aug-10 06:30:00	Completed Record through 8/23/20	
58		24-Aug-10 11:30:00	Completed Processing a			23-Aug-10 05:30:00	Completed Record through 8/23/20	
59		24-Aug-10 10:30:00	Completed Processing a			23-Aug-10 04:30:00	Completed Record through 8/23/20	
60		24-Aug-10 09:30:00	Completed Processing a			23-Aug-10 03:30:00	Completed Record through 8/23/20	
61		24-Aug-10 08:30:00	Completed Processing a			23-Aug-10 02:30:00	Completed Record through 8/23/20	
62		24-Aug-10 07:30:00	Completed Processing a			23-Aug-10 01:30:00	Completed Record through 8/23/20	
63		24-Aug-10 06:30:00	Completed Processing a			23-Aug-10 00:30:00	Completed Record through 8/23/20	
64		24-Aug-10 05:30:00	Completed Processing at 8/24/2010 5:30:00 AM					
65		24-Aug-10 04:30:00	Completed Processing at 8/24/2010 4:30:00 AM					
66		24-Aug-10 03:30:00	Completed Processing at 8/24/2010 3:30:00 AM					

OutputTags\data/create/Aliases/Sheet2/Sheet1/Alas/

Ready Calculate

MAJIQ screen

- Screen to show Reel tracking as a user sees it

EPS screen

- Screen to show production cost as a user sees it

GenPower



Maximo integration for Condition Based Maintenance

- PI Notifications
 - XML
 - jms queue (IBM Websphere)
 - Maximo

Use Case : Maintenance

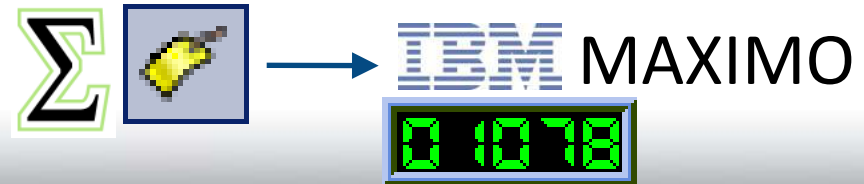
- Maintenance

- Usage based instead of calendar



- Implementation

- Machine run-hours using PI Totalizer Tag
- Totalizer Tag value sent to Maximo
CONTINUOUS METER



The PI System and XML

```
<?xml version="1.0" encoding="UTF-8" ?>
- <SyncLVP_OSITAG xmlns="http://www.ibm.com/maximo"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" creationTime="2010-08-26T13:24:05-04:00" transLanguage="EN" baseLanguage="EN"
  messageID="12390400479682333" maximoVersion="7 1 20091208-1415 V7116-173"
  event="0">
- <LVP_OSITAGSet>
  - <LVP_OSITAG action="AddChange">
    <CURVALUE>09900</CURVALUE>
    <DCSNAME>NONE</DCSNAME>
    <DESCRIPTION>Test Tag 5</DESCRIPTION>
    <LASTTIMESTAMP>Aug 26 2010 2:15PM</LASTTIMESTAMP>
    <LVP_OSITAGID>5</LVP_OSITAGID>
    <NOLASTREADING>0</NOLASTREADING>
    <ORGID>GENPOWER</ORGID>
    <QUALITY>GOOD</QUALITY>
    <SITEID>LONGVIEW</SITEID>
    <TAG>TestTag5</TAG>
  </LVP_OSITAG>
</LVP_OSITAGSet>
</SyncLVP_OSITAG>
```

<CURVALUE>9900</...>

<LASTTIMESTAMP>2010-08-26T13:10:00Z

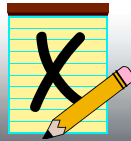
<QUALITY>GOOD</...>

<TAG>Tag5</...>

Maximo consultant - Can the PI System generate this XML?

Machine runhours to Maximo

- PI AF for mapping (transaction) 
- PI Notifications (XML Delivery) 
- Push data from the PI System 
- No middleware - use only PI System tools



Maximo CBM

- XML Delivery Channel code walk thru'
- 5min video for end – to – end PI System to Maximo data flow
- Will we have time to cover NY ISO use case?
- Cover IBM Ireland Green Sigma PI JDBC use case in this session?



Thank You!

OSIsoft®