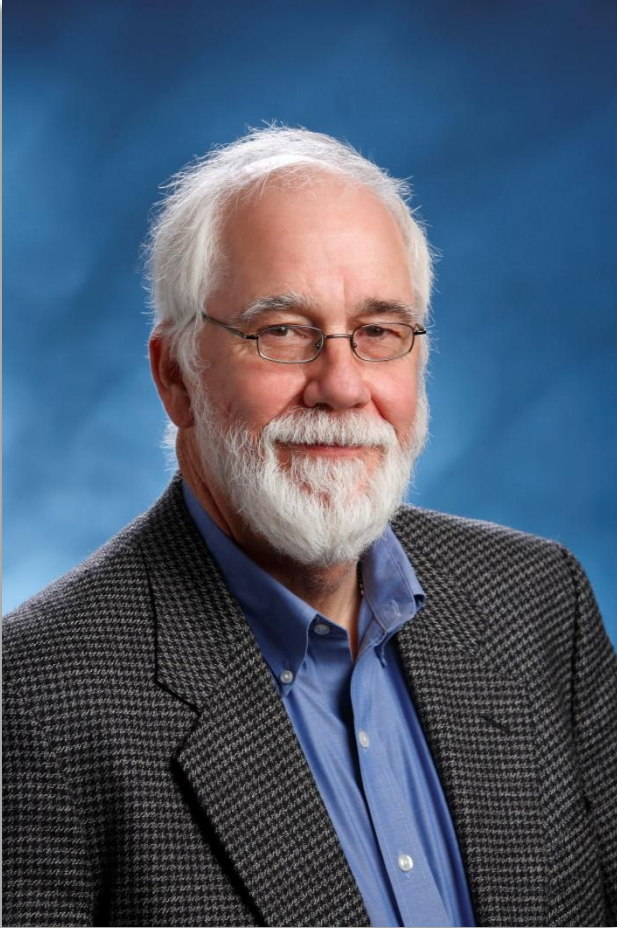




Overall equipment effectiveness in the PI System Ecosystem

Presented by **Dean MacLean, PEI Energy Systems**
Keith Flynn, RtTech Software Inc.

Mission



“Our mission is to maximize the Value our customers get from our product and services”

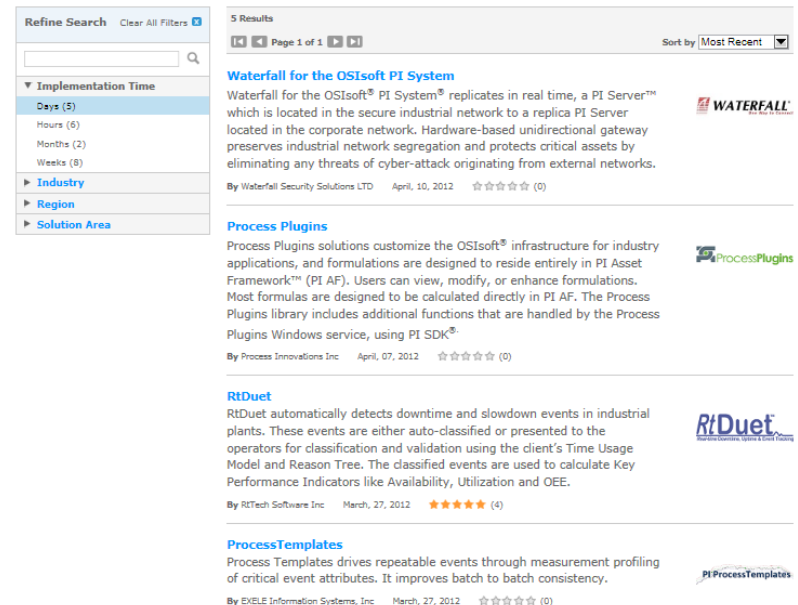
OSIsoft® Partner Solution Showcase

- Find software solutions from OSIsoft partners with specific industry and domain expertise.
- <http://partners.osisoft.com/solutions>



The banner features the OSIsoft logo on the left, followed by the text "partner solution showcase" in a large, bold font. Below this, it says "Connecting our customers with OSIsoft partner solutions". At the bottom, there is a red-bordered button with the text "Learn more at partners.osisoft.com/solutions".

pss@osisoft.com



The screenshot shows a search results page on the OSIsoft Partner Solution Showcase website. On the left, there is a "Refine Search" sidebar with filters for "Implementation Time" (Days (5), Hours (6), Months (2), Weeks (8)), "Industry", "Region", and "Solution Area". The main content area displays "5 Results" and lists three solutions:

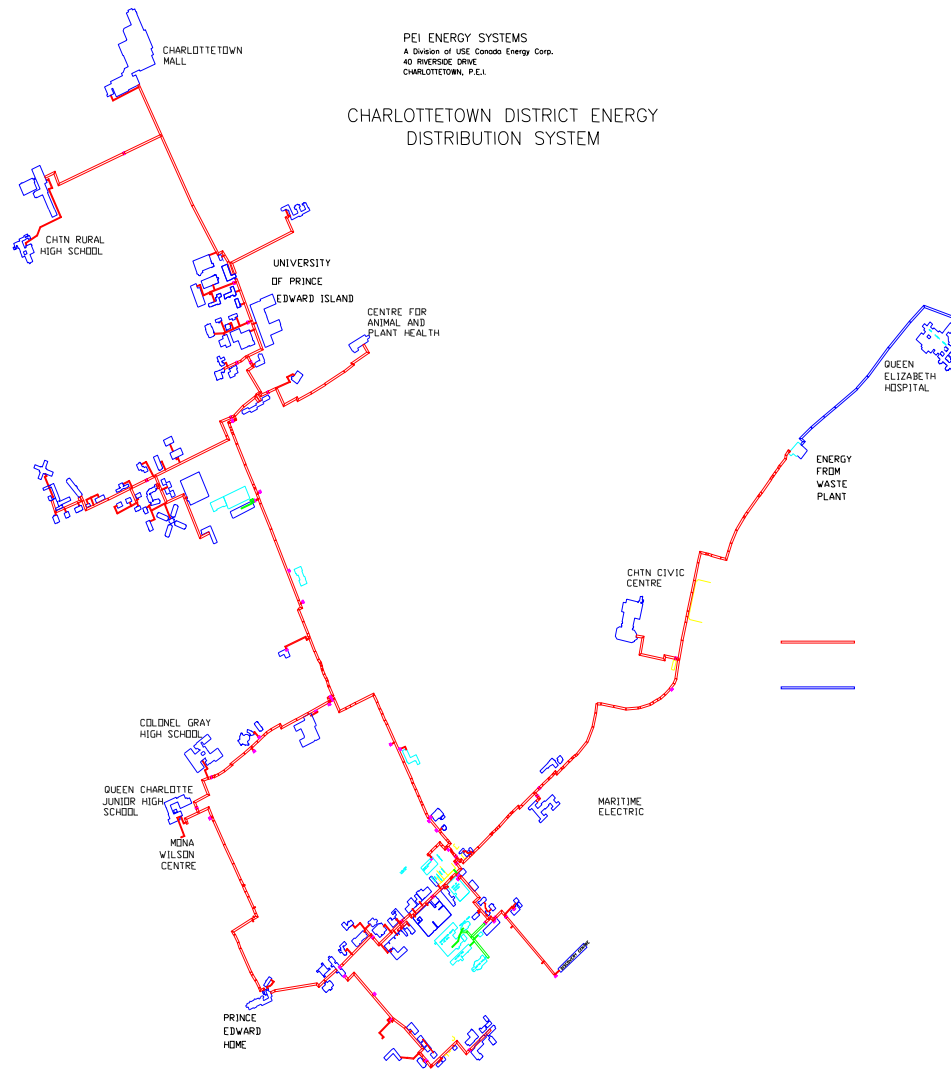
- Waterfall for the OSIsoft PI System**: A real-time PI Server™ replicating industrial network segregation. By Waterfall Security Solutions LTD, April 10, 2012. (0 reviews)
- Process Plugins**: Customizes OSIsoft infrastructure for industry applications. By Process Innovations Inc, April 07, 2012. (0 reviews)
- RtDuet**: Automatically detects downtime and slowdown events. By RTech Software Inc, March 27, 2012. (4 reviews)
- ProcessTemplates**: Drives repeatable events through measurement profiling. By EXELE Information Systems, Inc, March 27, 2012. (0 reviews)

Presenters

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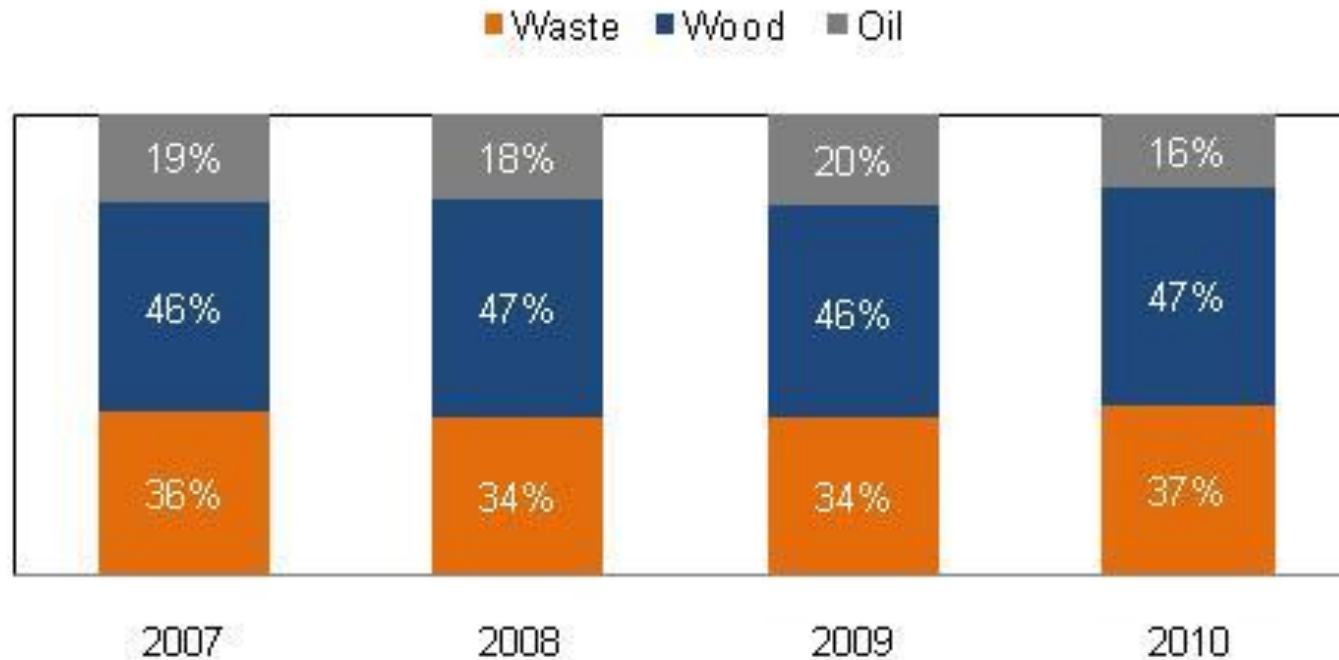
PEI Energy

Veresen PEI - The System



Annual Fuel Consumption

Fuel Usage by Type



Fuel Flexibility

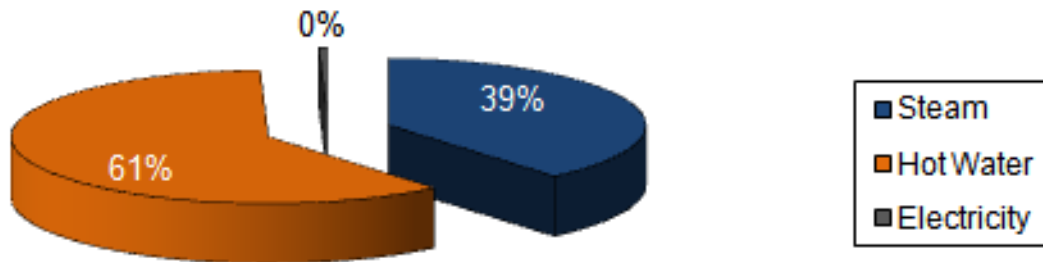


Charlottetown District Energy System

- System peak load ~ 40 MW – Equivalent to 4000 single family homes

- Cogeneration of electricity (1200 KW on peak)
 - 4800 MWh produced primarily for the displacement of purchased electricity
 - 600 MWh exported to the grid annually Equivalent to ~ 80 single family homes

Total Energy Sales 132,000 MWh

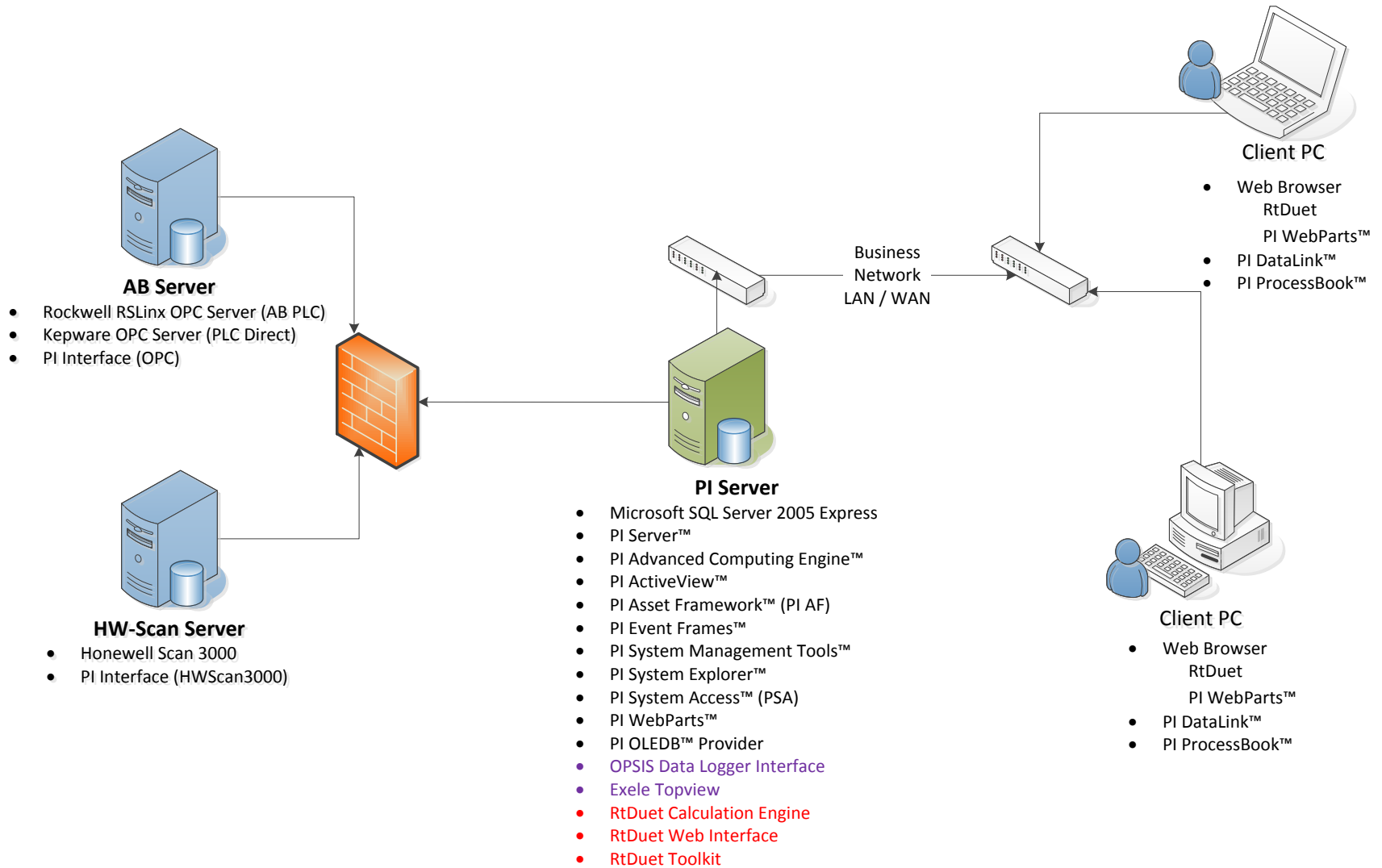


Our Situation

- No good up to date data for reporting Environmental Events
- Data was always old and hard to retrieve
- SCADA Honeywell Scan 3000
 - Data was always a month old
 - Saved everything to excel
 - Had to purge frequently
 - High requirement for manual data mining
- Updated controls to AB Control Logix and Rockwell RSView SE
 - Upgrades did not solve issues with data
- Needed a data historian for easy access to the data
- Needed a tool for analyzing environmental events

Our Solution

- Selected OSIsoft PI System™ and RtDuet™ (Installed 2009)
- Data Sources
 - Honeywell Scan 3000
 - PI HW3000 Interface
 - AB Control Logix PLCs
 - Rockwell RSLinx OPC Server
 - PI OPC Interface
 - PLC Direct
 - Kepware OPC Server
 - PI OPC Interface
 - OPSIS Data Logger
 - PI SDK Custom Interface
- RtDuet 2012 for PI AF
 - RtDuet Calculation Engine
 - RtDuet Toolkit
 - RtDuet Web Interface
 - RtDuet Data Server
- PI Server™
- PI Advanced Computing Engine™
- PI ActiveView™
- PI Asset Framework™ (PI AF)
- PI DataLink™
- PI Event Frames™
- PI ProcessBook™
- PI System Management Tools™
- PI System Explorer™
- PI System Access™ (PSA)
- PI WebParts™
- PI OLEDB™ Provider
- Exele Topview



Now – Our Solution

	(2009) <u>Then (Hrs)</u>	(2012) <u>Now (Hrs)</u>	<u>Annual</u> <u>Savings Estimate</u>
Annual Man Hours Saved from Reporting	192	12	\$ 27,000.00
Annual Operator Hours Saved	183	61	\$ 18,250.00
Data is now more accurate			
Data is now on time			
'EFW.INCIN.1.Secondary.temp.avg'<990			
Start	1-Sep-09	1-Sep-12	
End	1-Oct-09	1-Oct-12	
Hours	145.7	6.2	
% Reduction		95.8%	

Savings Estimate \$45,250.00

PEI Energy – PI System Demo

RtTech Software Inc. RtDuet

About **RtTech** Software Inc.

- Founded in November 2011 by ADM Systems Engineering Ltd. Software Group
- Head Office in Moncton, NB, Canada
- Resources in Canada, USA, Europe, Australia
- Developer of 2 products:
 - RtDuet: 6 year old product with 35+ installations worldwide.
 - RtEMIS: 2 year old product with 5 installations in North America.
- Mission: Development, Marketing and Sales of best in class products to turn Data into Actionable Information.

Why Manage Downtime

- Increased plant efficiency and performance
- Improved safety
- Extended asset life cycle
- Availability is a key maintenance and reliability metric
- Reduced Unplanned Maintenance
- Reduced maintenance costs
- Improved product quality
- Greater visibility of asset performance
- Working smarter rather than harder

Downtime in Operations

- Plant Stoppages
 - Unplanned maintenance (breakdowns)
 - Scheduled maintenance
 - Operational delays (blockages, shift change)
 - Non-scheduled time
 - Idle (Energy supply, feed supply, stock-bound)
- Plant Slowdowns
 - Aging equipment
 - Poor quality feed
 - Bottlenecks

Typical scenarios

- Paper log sheets / Excel based solution
 - Inaccurate information
 - Time consuming
 - Sheets are lost
 - Comments can not be analysed or quantified
- Downtime collation time consuming
- Uncontrolled information
- Home grown reporting systems are expensive to develop and maintain.

RtDuet – Rich History

1st Generation

Stand Alone Application
PI Tags for outputs and comments
Excel Reports

2nd Generation

PI ACE
Recalculation
Excel Reports

3rd Generation

Logic Tables
Annotations
New interface
Improved reporting

4th Generation

PI Batch
Web Interface
Configuration Toolkit
Web Service
SAP Integration

5th Generation

PI AF
Event Frames
Calculation Engine

2003

2004

2005

2006

2007

2008

2009

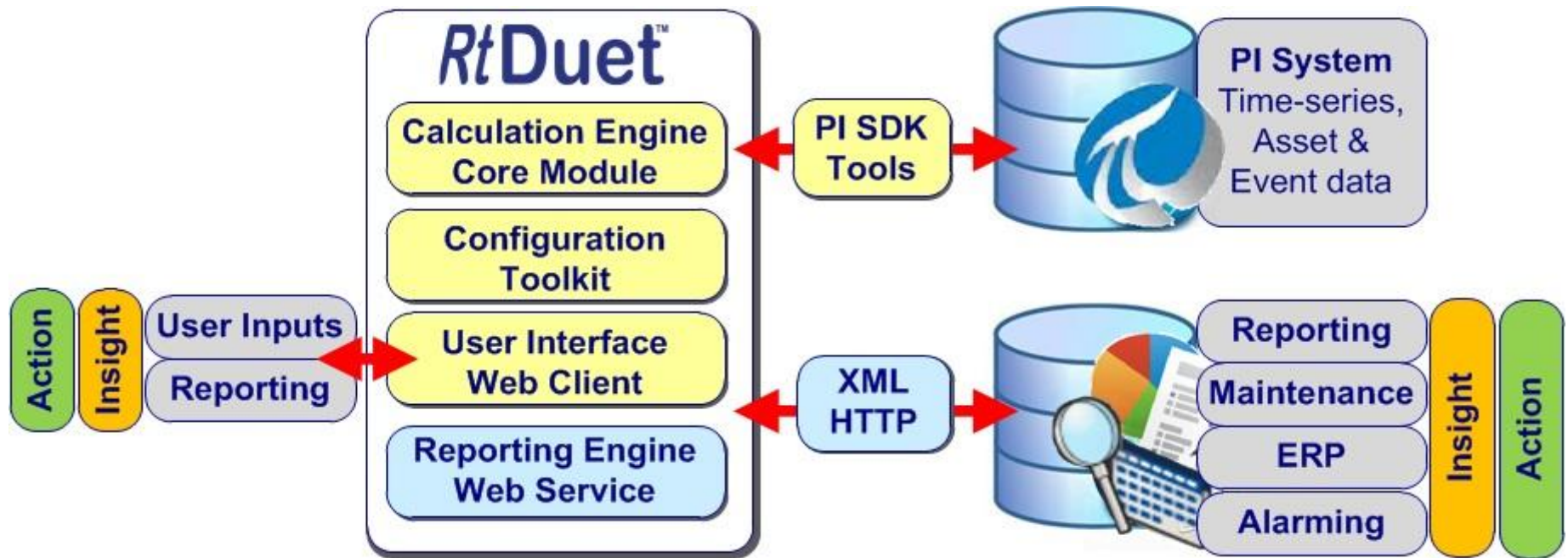
2010

2011



About RtDuet

Downtime and OEE



RtDuet - Downtime

- Automatically generates operational performance information

The screenshot displays the RtDuet software interface, which is used for configuring and monitoring downtime events. The main window, titled 'RtDuet Downtime Event', shows a list of event types and their configurations. The 'Event Type' column is highlighted, and the 'Manual Entry' event type is selected. The 'Description' column shows the event type, and the 'Default Value' column shows the default value for each event type.

The 'RtDuet - PI System Explorer' window is also visible, showing a list of event frames. The 'Event Frames' tab is active, and the 'mc' event frame is selected. The table below shows the details of the event frames, including the Name, Start Time, End Time, Description, Category, and Template.

Name	Start Time	End Time	Description	Category	Template
Test_20110302_125000	3/11/2011 12:02:07 AM	3/11/2011 12:02:37 AM	76552922-9dc...	RID...	
Cargill_20110311_120000	3/11/2011 12:03:07 AM	3/11/2011 12:03:37 AM	76552922-9dc...	RID...	
10Min_20110311_120000	3/11/2011 12:04:07 AM	3/11/2011 12:04:37 AM	76552922-9dc...	RID...	
15Min_20110311_120000	3/11/2011 12:05:07 AM	3/11/2011 12:05:37 AM	76552922-9dc...	RID...	
Demo_20110311_120000	3/11/2011 12:06:07 AM	3/11/2011 12:06:37 AM	76552922-9dc...	RID...	
Interval_20110311_120000	3/11/2011 12:07:07 AM	3/11/2011 12:07:37 AM	76552922-9dc...	RID...	
30Min_20110311_120000	3/11/2011 12:08:07 AM	3/11/2011 12:08:37 AM	76552922-9dc...	RID...	
MC02_20110311_120000	3/11/2011 12:09:07 AM	3/11/2011 12:09:37 AM	76552922-9dc...	RID...	
MC02_20110311_120007	3/11/2011 12:10:07 AM	3/11/2011 12:10:37 AM	76552922-9dc...	RID...	
MC02_20110311_120307	3/11/2011 12:11:07 AM	3/11/2011 12:11:37 AM	76552922-9dc...	RID...	
MC02_20110311_120407	3/11/2011 12:12:07 AM	3/11/2011 12:12:37 AM	76552922-9dc...	RID...	
MC02_20110311_120537	3/11/2011 12:13:07 AM	3/11/2011 12:13:37 AM	76552922-9dc...	RID...	
MC02_20110311_120707	3/11/2011 12:14:07 AM	3/11/2011 12:14:37 AM	76552922-9dc...	RID...	
MC02_20110311_120837	3/11/2011 12:15:07 AM	3/11/2011 12:15:37 AM	76552922-9dc...	RID...	
Cargill_20110311_121000	3/11/2011 12:16:07 AM	3/11/2011 12:16:37 AM	76552922-9dc...	RID...	
10Min_20110311_121000	3/11/2011 12:17:07 AM	3/11/2011 12:17:37 AM	76552922-9dc...	RID...	
MC02_20110311_121137	3/11/2011 12:18:07 AM	3/11/2011 12:18:37 AM	76552922-9dc...	RID...	
MC02_20110311_121337	3/11/2011 12:19:07 AM	3/11/2011 12:19:37 AM	76552922-9dc...	RID...	
15Min_20110311_121500	3/11/2011 12:20:07 AM	3/11/2011 12:20:37 AM	76552922-9dc...	RID...	
Demo_20110311_121500	3/11/2011 12:21:07 AM	3/11/2011 12:21:37 AM	76552922-9dc...	RID...	
Interval_20110311_121500	3/11/2011 12:22:07 AM	3/11/2011 12:22:37 AM	76552922-9dc...	RID...	
MC02_20110311_121707	3/11/2011 12:23:07 AM	3/11/2011 12:23:37 AM	76552922-9dc...	RID...	
MC02_20110311_121907	3/11/2011 12:24:07 AM	3/11/2011 12:24:37 AM	76552922-9dc...	RID...	
Cargill_20110311_122000	3/11/2011 12:25:07 AM	3/11/2011 12:25:37 AM	76552922-9dc...	RID...	
10Min_20110311_122000	3/11/2011 12:26:07 AM	3/11/2011 12:26:37 AM	76552922-9dc...	RID...	
MC02_20110311_122237	3/11/2011 12:27:07 AM	3/11/2011 12:27:37 AM	76552922-9dc...	RID...	
MC02_20110311_122407	3/11/2011 12:28:07 AM	3/11/2011 12:28:37 AM	76552922-9dc...	RID...	
MC02_20110311_122507	3/11/2011 12:29:07 AM	3/11/2011 12:29:37 AM	76552922-9dc...	RID...	
MC02_20110311_122637	3/11/2011 12:30:07 AM	3/11/2011 12:30:37 AM	76552922-9dc...	RID...	
Cargill_20110311_123000	3/11/2011 12:31:07 AM	3/11/2011 12:31:37 AM	76552922-9dc...	RID...	
10Min_20110311_123000	3/11/2011 12:32:07 AM	3/11/2011 12:32:37 AM	76552922-9dc...	RID...	
MC02_20110311_123237	3/11/2011 12:33:07 AM	3/11/2011 12:33:37 AM	76552922-9dc...	RID...	
MC02_20110311_123407	3/11/2011 12:34:07 AM	3/11/2011 12:34:37 AM	76552922-9dc...	RID...	
MC02_20110311_123537	3/11/2011 12:35:07 AM	3/11/2011 12:35:37 AM	76552922-9dc...	RID...	
MC02_20110311_123707	3/11/2011 12:36:07 AM	3/11/2011 12:36:37 AM	76552922-9dc...	RID...	
MC02_20110311_123837	3/11/2011 12:37:07 AM	3/11/2011 12:37:37 AM	76552922-9dc...	RID...	
MC02_20110311_123907	3/11/2011 12:38:07 AM	3/11/2011 12:38:37 AM	76552922-9dc...	RID...	
MC02_20110311_124137	3/11/2011 12:39:07 AM	3/11/2011 12:39:37 AM	76552922-9dc...	RID...	
MC02_20110311_124207	3/11/2011 12:40:07 AM	3/11/2011 12:40:37 AM	76552922-9dc...	RID...	
MC02_20110311_124307	3/11/2011 12:41:07 AM	3/11/2011 12:41:37 AM	76552922-9dc...	RID...	
MC02_20110311_124407	3/11/2011 12:42:07 AM	3/11/2011 12:42:37 AM	76552922-9dc...	RID...	
MC02_20110311_124507	3/11/2011 12:43:07 AM	3/11/2011 12:43:37 AM	76552922-9dc...	RID...	
MC02_20110311_124537	3/11/2011 12:44:07 AM	3/11/2011 12:44:37 AM	76552922-9dc...	RID...	
MC02_20110311_124607	3/11/2011 12:45:07 AM	3/11/2011 12:45:37 AM	76552922-9dc...	RID...	
MC02_20110311_124637	3/11/2011 12:46:07 AM	3/11/2011 12:46:37 AM	76552922-9dc...	RID...	

RtDuet - Downtime

- Exposes business logic using a configuration environment driven by templates

The screenshot displays the RtDuet Toolkit interface, which is used for configuring and managing downtime events. The main window is divided into several panes:

- Configuration:** A tree view on the left showing the hierarchy of equipment and triggers. It includes categories like Australia, Halifax, Moncton, Auxiliary Equipment, Feed Preparation, Machine 1, Machine 2, Machine 3, Packaging, and Processing Plant.
- Events:** A central pane showing a list of events, including High Temperature, High vibrations, Sensor Fault, Force of Nature, No Feed, No Labour, Blocked Chute, Dirty chute, Feed problem, Sensor fault, Gearbox Oil, and Force of Nature.
- Reason Tree:** A pane on the right showing a detailed tree view of the reasons for an event, such as High vibrations, High Temperature, Sensor Fault, Force of Nature, No Feed, No Labour, Blocked Chute, Dirty chute, Feed problem, Sensor fault, Gearbox Oil, and Force of Nature.
- High vibrations:** A pane on the right showing the details of a specific event, including its Name, Description, Template, Categories, and Default Attribute.
- Edit Event:** A dialog box for editing an event, showing fields for Start Time, End Time, Event Type, Comment, Time Usage Code, and Manual Codes. It also includes a Reason Code section with a list of codes like Maintenance, Bearings, Engine, High Temp, Low Lubrication, Mixing, Packaging, Pump, No Feed, Power Loss, and Safety Stop.

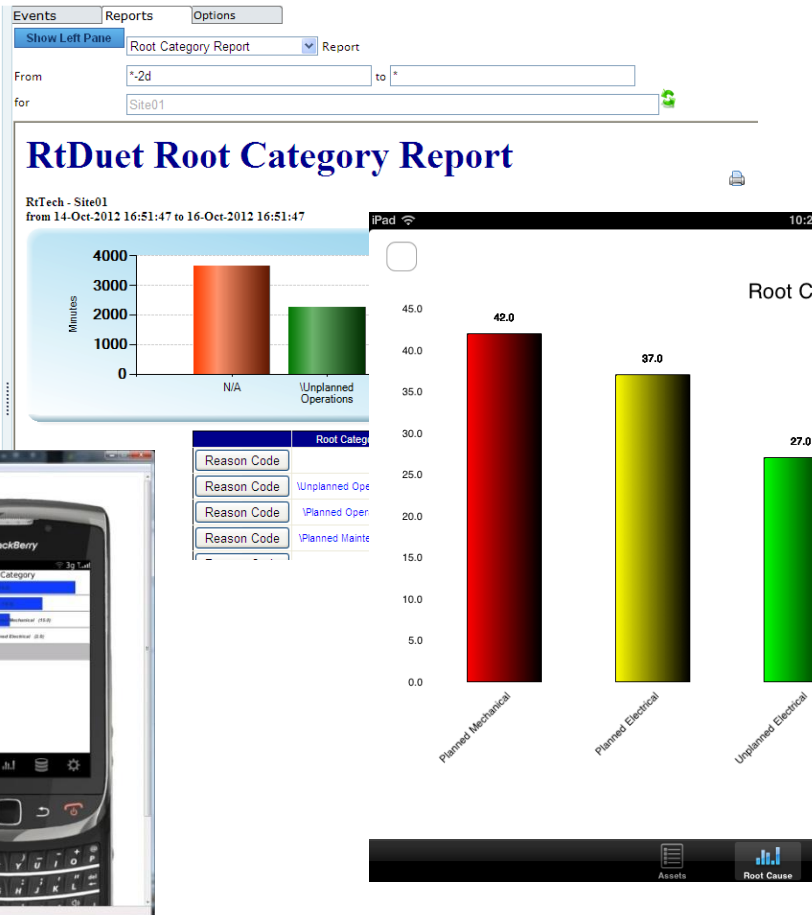
The interface is connected to an AF Server (rttechsoftware.dyndns.org) as an Administrator with Administrator permissions. The status bar at the bottom indicates the current event is 'High vibrations' modified on 3/12/2012 at 10:30:18 AM, with a version of 1/1/1970 12:00:00 AM and Revision 2.

RtDuet - Downtime

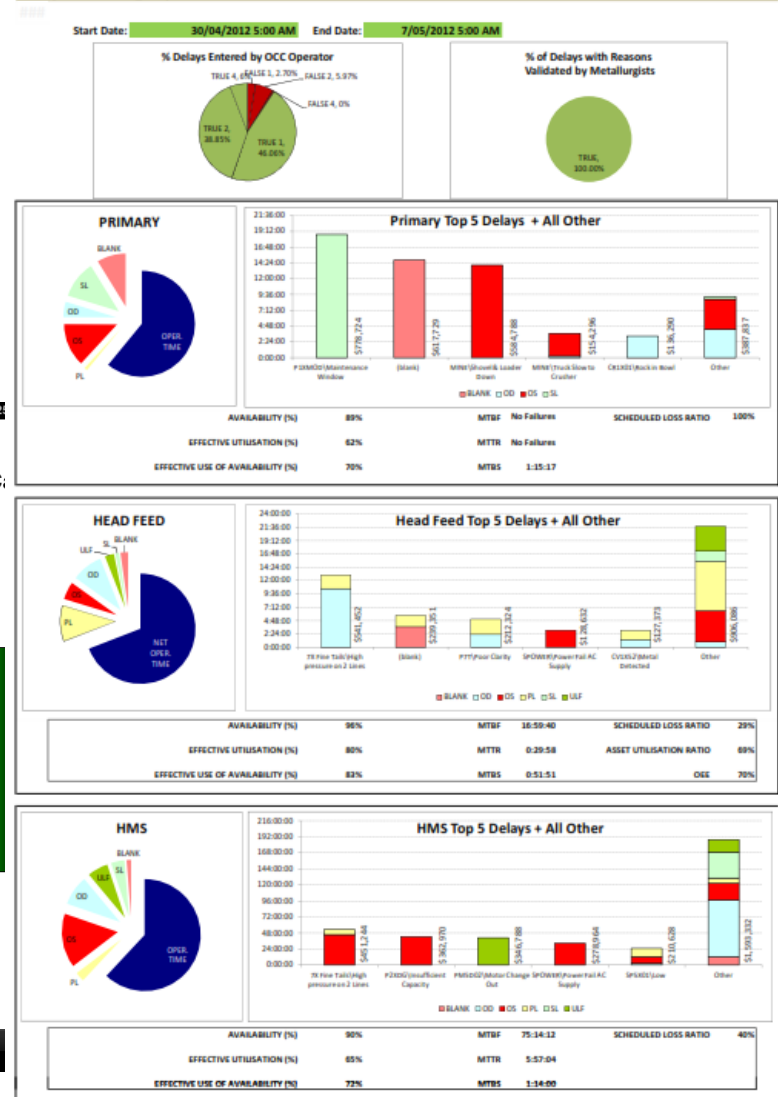
- Delivers Information

RtDuet
Real-time Downtime, Uptime & Event Tracking

RtTech
Site01
Area01
Area02
Area03

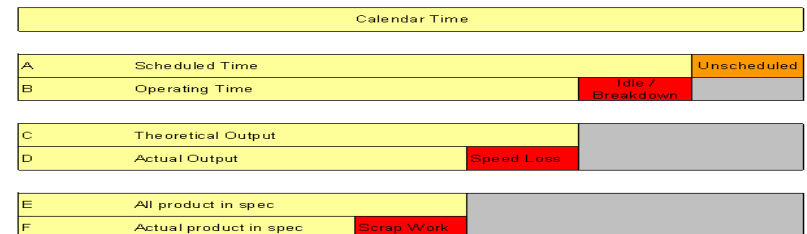


Delay Accounting Reports



About RtDuet - OEE

- Overall Equipment Effectiveness (OEE) is an Asset Performance KPI
- Some companies have designed their own slightly different version of OEE.
- RtDuet can be configured to meet all the OEE definitions
- OEE breaks the performance of a manufacturing unit into:
 - Availability
 - Performance
 - Quality



B/A = Availability

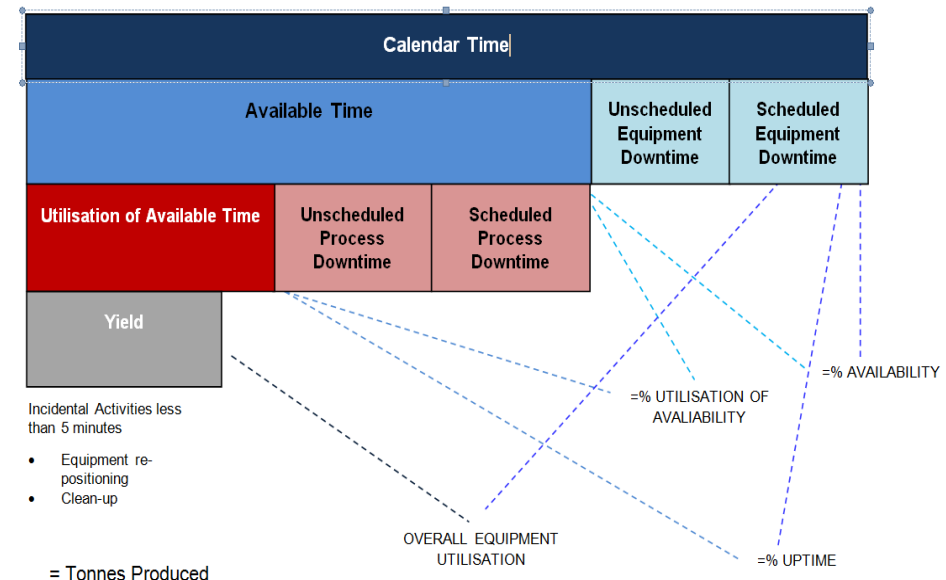
D/C = Performance

F/E = Quality

$$OEE = B/A \times D/C \times F/E$$

About RtDuet - OEE

- **Availability:**
- Represents the percentage of scheduled time that the operation is available to operate.
- The Availability Metric is a pure measurement of Uptime
- Most manufacturing companies have developed a Time Usage Model that states how Availability is calculated



$$Availability = \frac{Calendar\ Time - Scheduled\ Equ.\ Downtime - Unscheduled\ Equ.\ Downtime}{Calendar\ Time}$$

About RtDuet - OEE

The image displays three overlapping windows from the RtDuet software interface:

- RtDuet Toolkit:** The main window with a menu bar (File, Tools, Help) and a toolbar. It features a left-hand tree view showing a hierarchical structure of configurations, including 'RtDuet Configuration', 'RtDuet Auxiliary Categories', 'RtDuet Calculation Engines', 'RtTech', and various machines and triggers. The main area has tabs for 'Configuration', 'Events', 'Reason Tree', and 'Time Usage Model'. The 'Configuration' tab is active, showing a 'Name' field with 'Scheduled Operations', a 'Display Text' field, and an 'OEE Calculation Type' dropdown set to 'Utilized'. There are also radio buttons for 'Planned' and 'Unplanned'.
- RTTECHSOFTWARE.dyndns.org: RtDuet24 - P1 System Explorer:** A window showing a tree view of system elements. The 'Scheduled Maintenance' element is selected, and its details are shown in the main area. The details include a table with columns 'Name' and 'Value':

Name	Value
Calculated_Utilization	False
Display Text	Mantenimiento Planeado
OEE Type	
Planned	
Show in AU Graph	
Sign	
- Edit Event:** A dialog box for editing an event. It has a title bar 'Edit Event' and a main area with fields for 'Start Time' (14-Oct-2012 18:00:11), 'End Time' (15-Oct-2012 00:00:11), 'Event Type' (Downtime), 'Comment', 'Time Usage Code' (Unplanned Operations), and 'Manual Codes'. A 'Reason Code' section on the right lists 'Maintenance', 'No Feed', 'Power Loss', and 'Safety Stop'. The 'Manual Codes' dropdown is set to 'Unplanned Operations'. Buttons for 'OK', 'Clear Fields', and 'Cancel' are at the bottom.

About RtDuet - OEE

Performance:

- Represents the speed at which the Work Center runs as a percentage of its designed speed

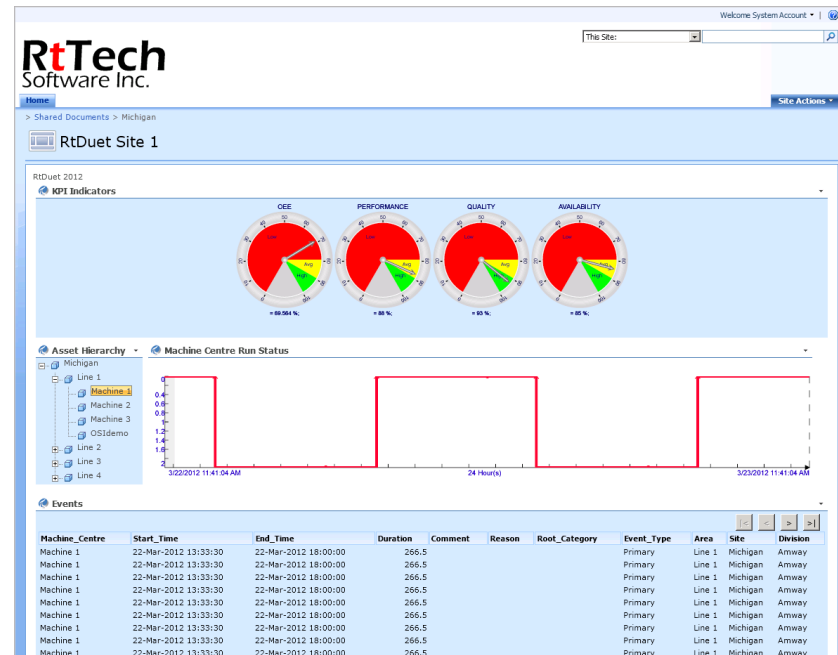
$$\text{Performance} = \frac{\text{Production achieved when running}}{\text{Theoretical Production}}$$

Quality:

- Represents the Good Units produced as a percentage of the Total Units Started
- We can calculate it or access it from other existing systems

About RtDuet - OEE

- RtDuet uses the classified events to calculate real-time Key Performance Indicators (KPI) like:
 - OEE
 - Availability
 - Utilization
 - MTBF
 - MTTR
 - MTBS
 - Effective Utilization
 - Operating Efficiency
 - ...



RtDuet Benefits

- Transforms Operational Data into Actionable Information to:
 - Optimize Performance
 - Reduce Downtimes
 - Reduce Operator workload
 - Standardized Information
 - Increase Profits

RtTech Software RtDuet Demo

Questions?

Partner Solution Showcase Webinar Series

Date	Title
September 5, 2012	Migration of DCS/SCADA Graphics to PI ProcessBook (Automatic and Fast)
September 19, 2012	Tag Tuning to Optimize Information Retained in the PI Server
October 3, 2012	One Way PI System Data Transmission from Secure to Business Networks
November 7, 2012	Process Calculations and Characterization embedded in PI Asset Framework
December 5, 2012	KPIs, Data and Events On Any Mobile Device

Webinar Recordings

You can watch previously recorded
Partner Solution Showcase Webinars
at <http://partners.osisoft.com/solutions>



Thank you

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