VOYAGE2007

Downtime Tracking in the Mining Industry

Presenter #1 Mark Dwyer
Title: App Development Mgr
Zinifex Ltd.

Presenter #2 Keith Flynn
Title: VP Data Management
ADM Systems Engineering

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Agenda

- Introduction
- Business Challenge
- Solution Description
- Benefits
- Future Plans

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Introduction

Presenter #1 Mark Dwyer
Title: App Development Mgr
Zinifex Ltd.

Presenter #2 Keith Flynn
Title: VP Data Management
ADM Systems Engineering

Introduction

- Zinifex Rosebery Mine
  - **ADM and AIS were engaged by Zinifex to implement an automated downtime system.**

Introduction

- Zinifex Rosebery Mine
  - **Rosebery Mine is a multi-metal underground operation in Tasmania, Australia.**

    Its products include zinc, lead and copper concentrates along with silver and gold.

  - **PI Infrastructure: Multiple PI Systems throughout the business.**

Business Challenges

1. **Improve the Return on Invested Capital through better asset utilization.**
   - Measuring Downtime is critical to improving asset utilization.
2. **Implement a solution that works.**
   - Has to be simple, easy to use and easy to understand by all.

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Business Challenge 1

- Recording, classifying and understanding downtime has not traditionally been a straight forward activity. In many cases, the onerous task of capturing downtime data is left to control room staff, whose priority is to keep the plant operational rather than performing data entry duties.
- As a result, downtime data is incomplete or inaccurate, and downtime tracking efforts are often **abandoned.**

Business Challenge 1

- Automating Downtime Tracking is necessary to improve asset utilization.

Business Challenge 2

- Implementing the automated Downtime System
  - Operators and Management are too busy. **Need a solution that saves time vs. adding work.**
  - **This task can be seen as a "Bear"** and dropped from management priority even though ROI is usually < 6 months.

Business Challenge 2

- The downtime system implementation needs to be broken down into a **straight-forward project** to move forward.

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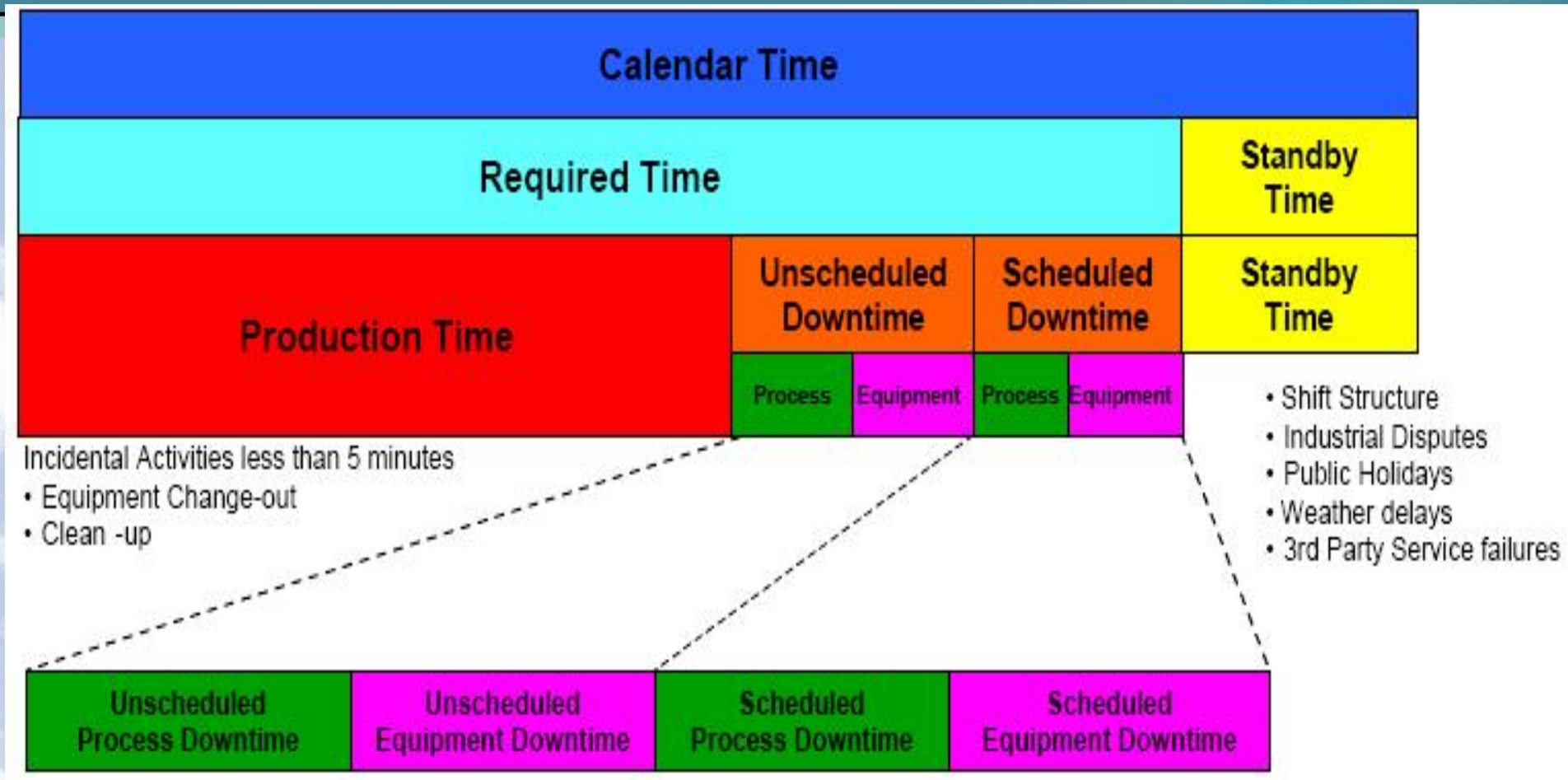
Solution Description

- Downtime Tracking System Requirements:
  - Automatically and accurately capture downtime and lost opportunity for sub areas and selected equipment primarily through an automated means while allowing for manual data entry as required
  - Provide reliable and meaningful information by allowing downtime events to be classified (e.g. planned/ unplanned, process/ equipment, reasons, etc.) and organized without excessive data entry effort by the appropriate personnel, in a manner that is consistent with work processes

Solution Description

- Downtime Tracking System Requirements:
  - Support root cause analysis by capturing and providing event history with sufficient detail
  - Allow plant personnel to expand the system by adding new failure codes and triggers as the knowledge base grows and the plant evolves
  - Interface with CMMS, ERPs, and other database applications
  - Minimize network traffic
  - Minimize tag consumption

Solution Description



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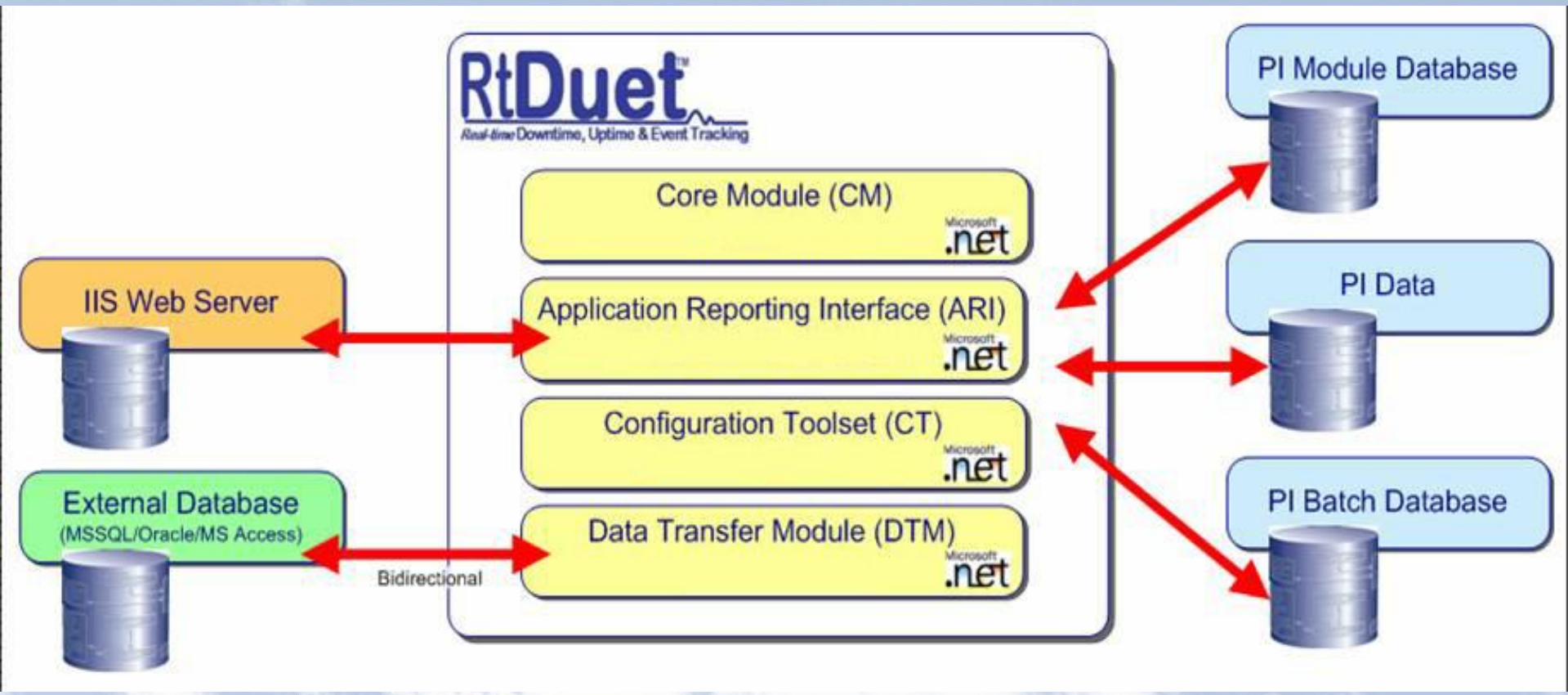
Solution Description

- A licensed software for Downtime Tracking using your PI System.
- Supported by the OSIsoft Partnership Program, Product Embedding and ISV agreement.

Solution Description

RtDuet™
Real-time Downtime, Uptime & Event Tracking



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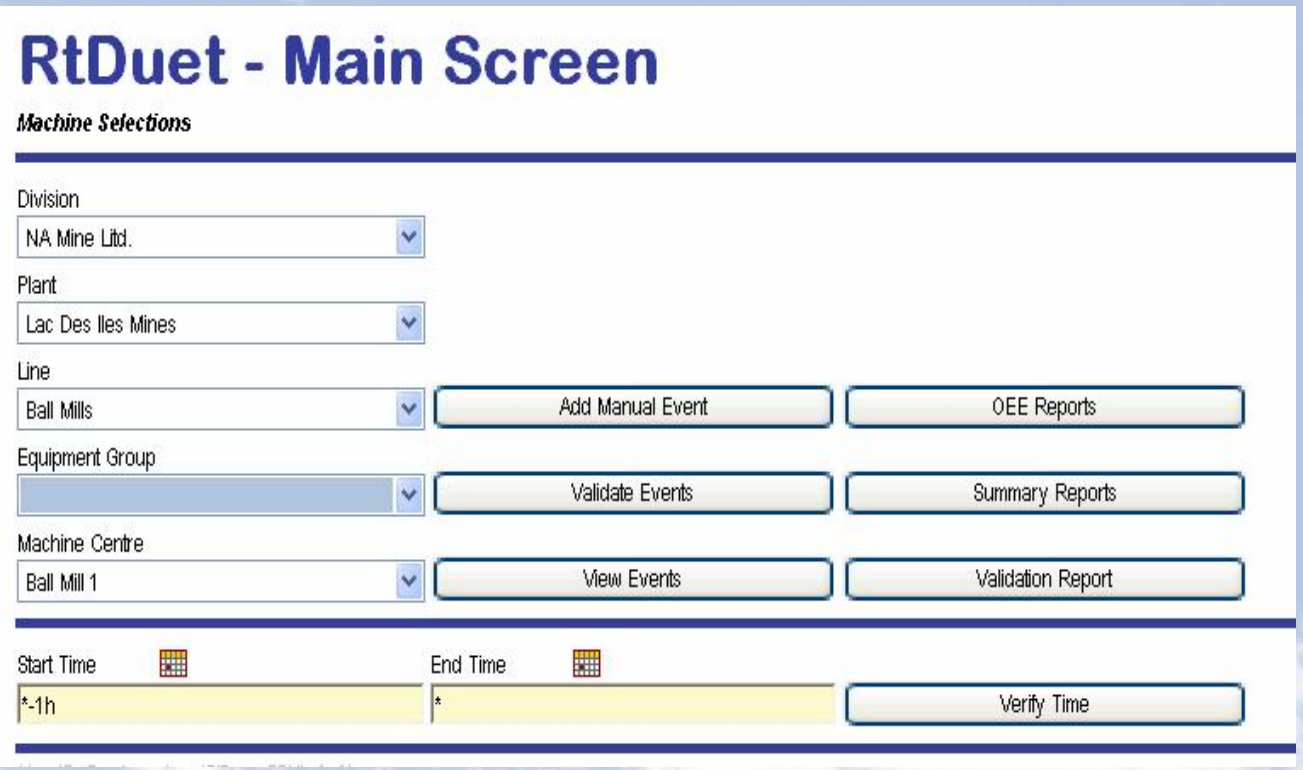

Main Screen

- Provides Navigation
- ASP.NET
- Links:
  - Operator or Management Views
  - Manual Entry
  - Validation
  - Reports

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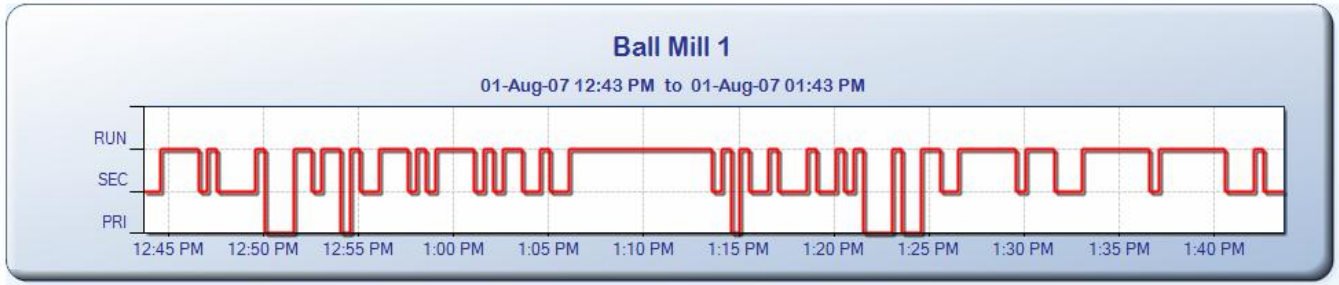
Solution Description

RtDuet™
Real-time Downtime, Uptime & Event Tracking

RtDuet - Event Monitor

NA Mine Ltd. - Lac Des Iles Mines - Ball Mills - [Ball Mills] - Ball Mill 1

RtDuet™ Downtime, Uptime & Event Tracking



☐ Show unvalidated only ☐ Show uncompleted only [Main] [Edit Selected]

		Timestamp	EndTime	Minutes	Division	Site	Area	MGrp	MCtr	Location	Problem	Cause	Action/Comments	Root Category	Operator	Crew	Type	MTA	P/U	A/M	Validated	Validated By	Validated Date
Select	☐	8/1/2007 1:42:34 PM	8/1/2007 1:43:51 PM	1.28	NA Mine Ltd.	Lac Des Iles Mines	Ball Mills	Ball Mills	Ball Mill 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Secondary	N/A	N/A	Auto	False	N/A	
Select	☐	8/1/2007 1:40:34 PM	8/1/2007 1:42:04 PM	1.5	NA Mine Ltd.	Lac Des Iles Mines	Ball Mills	Ball Mills	Ball Mill 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Secondary	N/A	N/A	Auto	False	N/A	
Select	☐	8/1/2007 1:36:34 PM	8/1/2007 1:37:04 PM	0.5	NA Mine Ltd.	Lac Des Iles Mines	Ball Mills	Ball Mills	Ball Mill 1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Secondary	N/A	N/A	Auto	False	N/A	

Event Monitor

- View events in real time and assign causes.

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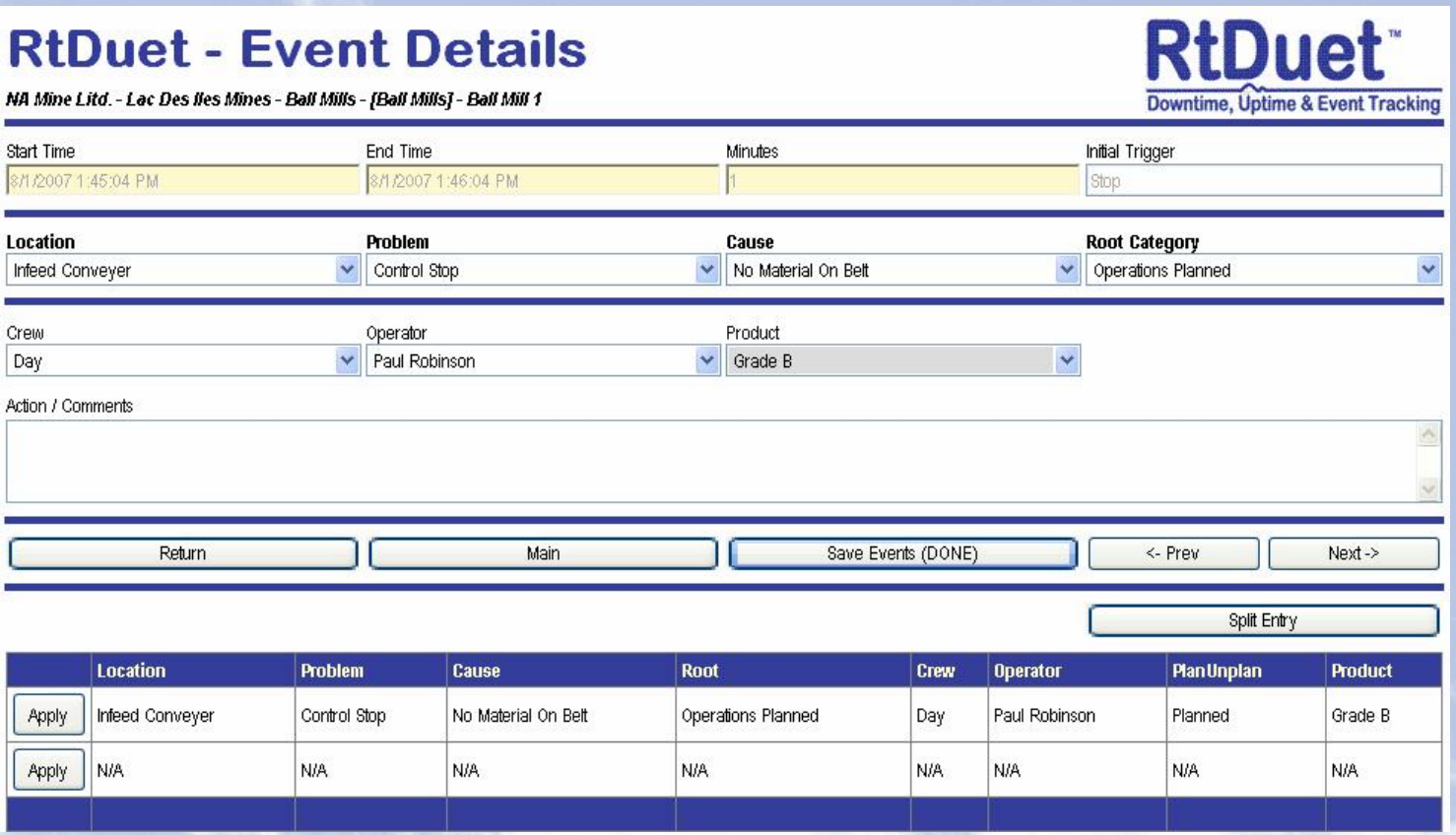
Solution Description

RtDuet™
Real-time Downtime, Uptime & Event Tracking



Event Screen

- Assign Root Causes automatically or when convienient.

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Solution Description

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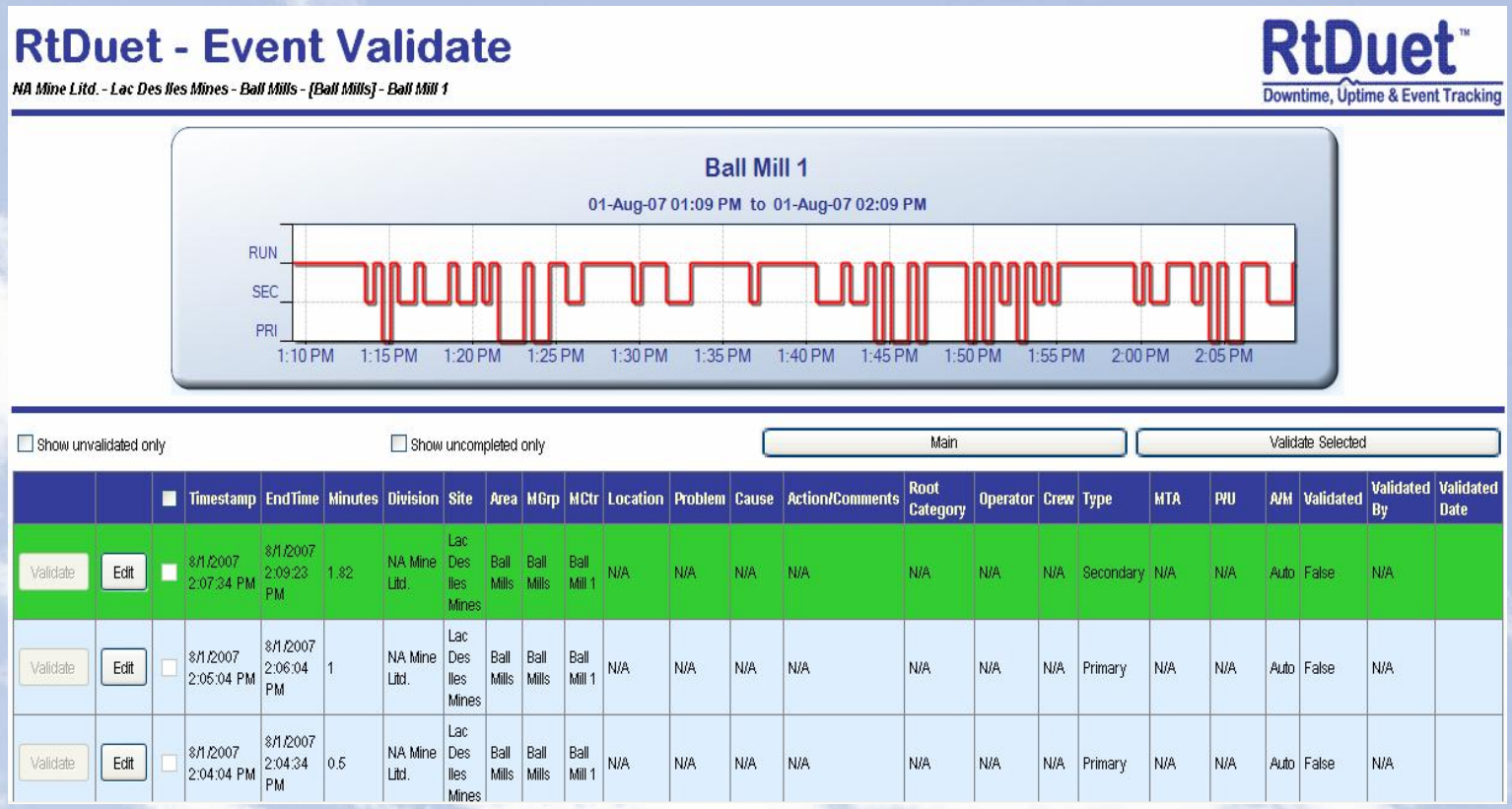

			Timestamp	EndTime	Minutes	Division	Site	Area	MGrp	MCtr	Location	Problem	Cause	Action/Comments	Root Category	Operator	Crew	Type	MTA	P/U	A/M	Validated	Validated By	Validated Date
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Validation Screen

- Validate automatic or manual reason codes.

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Solution Description

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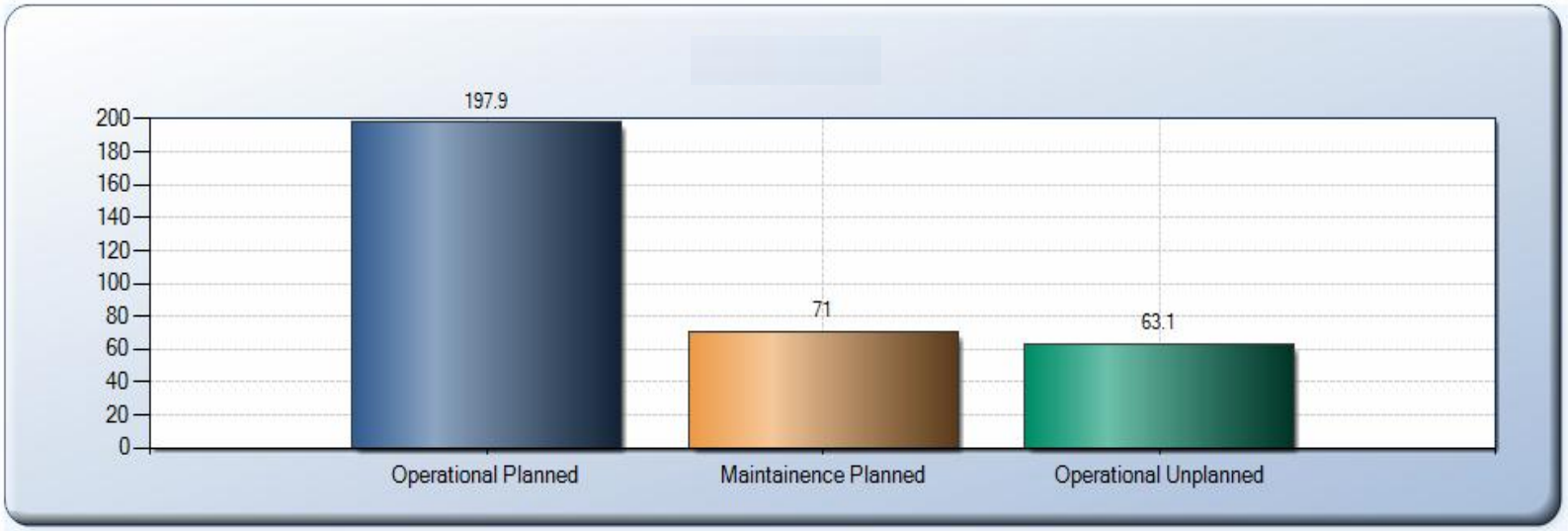
Real-time Downtime, Uptime & Event Tracking

Duet™ - Root Category Report



Return | Summary Report | Print | Main

	StartTime	EndTime	Root	Duration	Qty
Select	8/13/2006 10:32:00 AM	8/13/2006 10:32:00 PM	Operational Planned	197.9	5
Select	8/13/2006 10:32:00 AM	8/13/2006 10:32:00 PM	Maintainence Planned	71	1
Select	8/13/2006 10:32:00 AM	8/13/2006 10:32:00 PM	Operational Unplanned	63.1	7

Reports

- Drill Downs to Root Cause
- WEB or PDF

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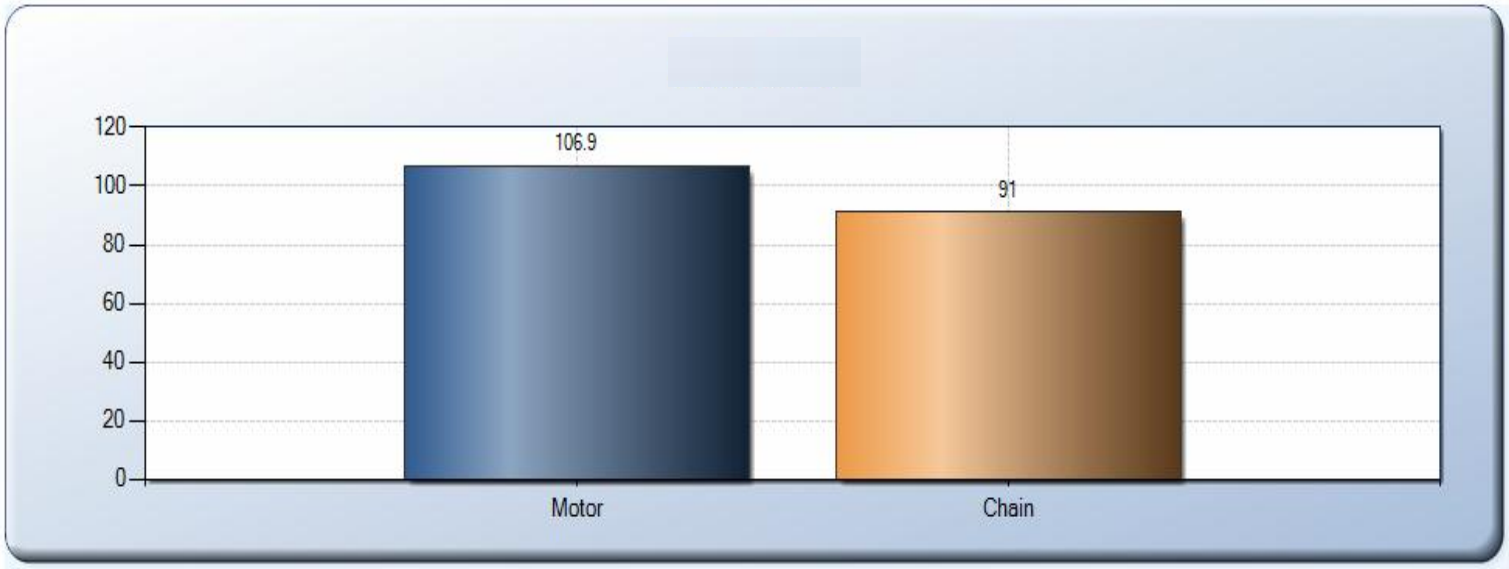
Solution Description

RtDuet™
Real-time Downtime, Uptime & Event Tracking

Duet™ - Location Report



Return | Summary Report | Print | Main

	StartTime	EndTime	Root	Location	Duration	Qty
Select	8/13/2006 10:32:00 AM	8/13/2006 10:32:00 PM	Operational Planned	Motor	106.9	2
Select	8/13/2006 10:32:00 AM	8/13/2006 10:32:00 PM	Operational Planned	Chain	91	3

Reports

- Drill Down to location of cause
- WEB or PDF

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Solution Description

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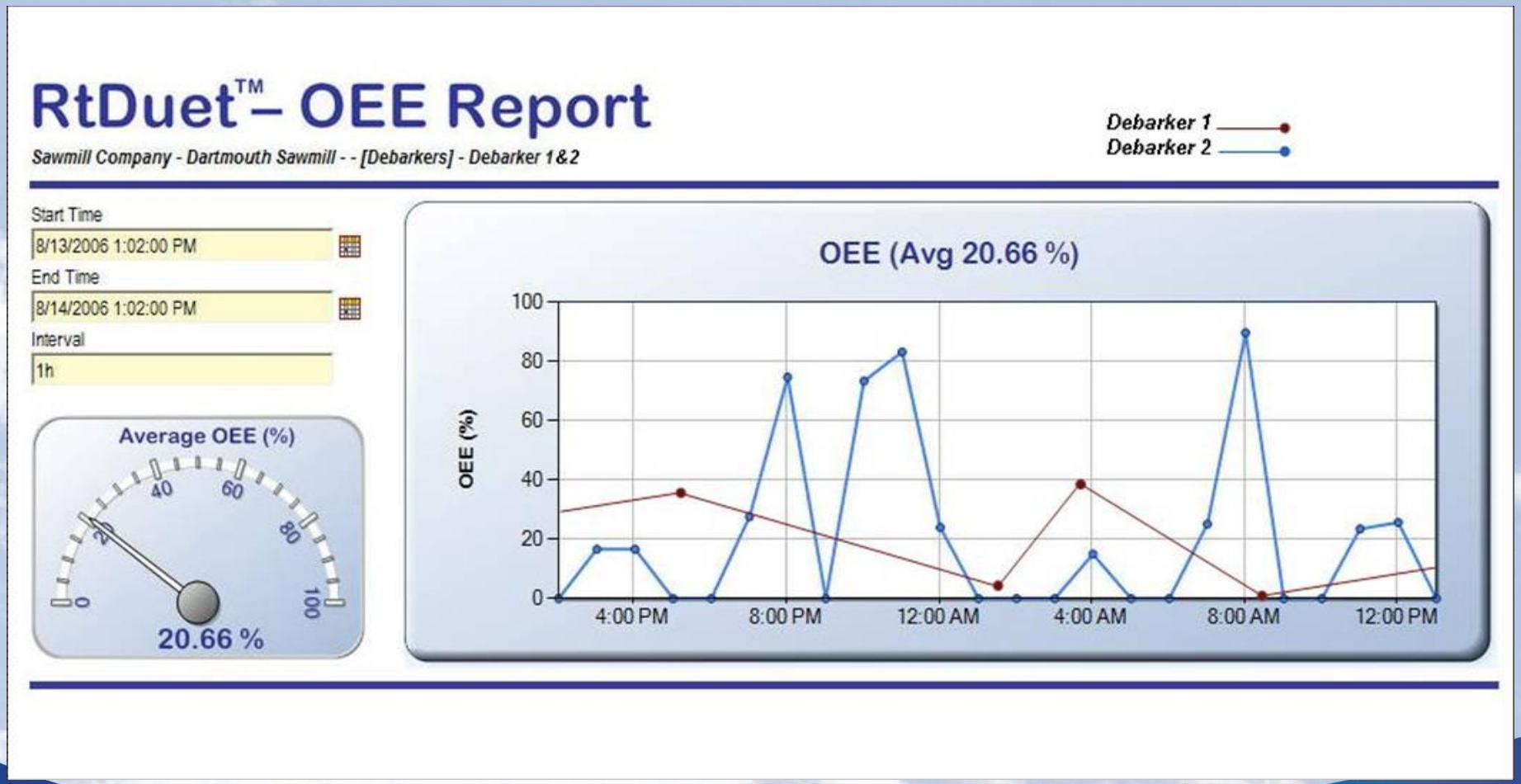
Real-time Downtime, Uptime & Event Tracking



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Solution Description

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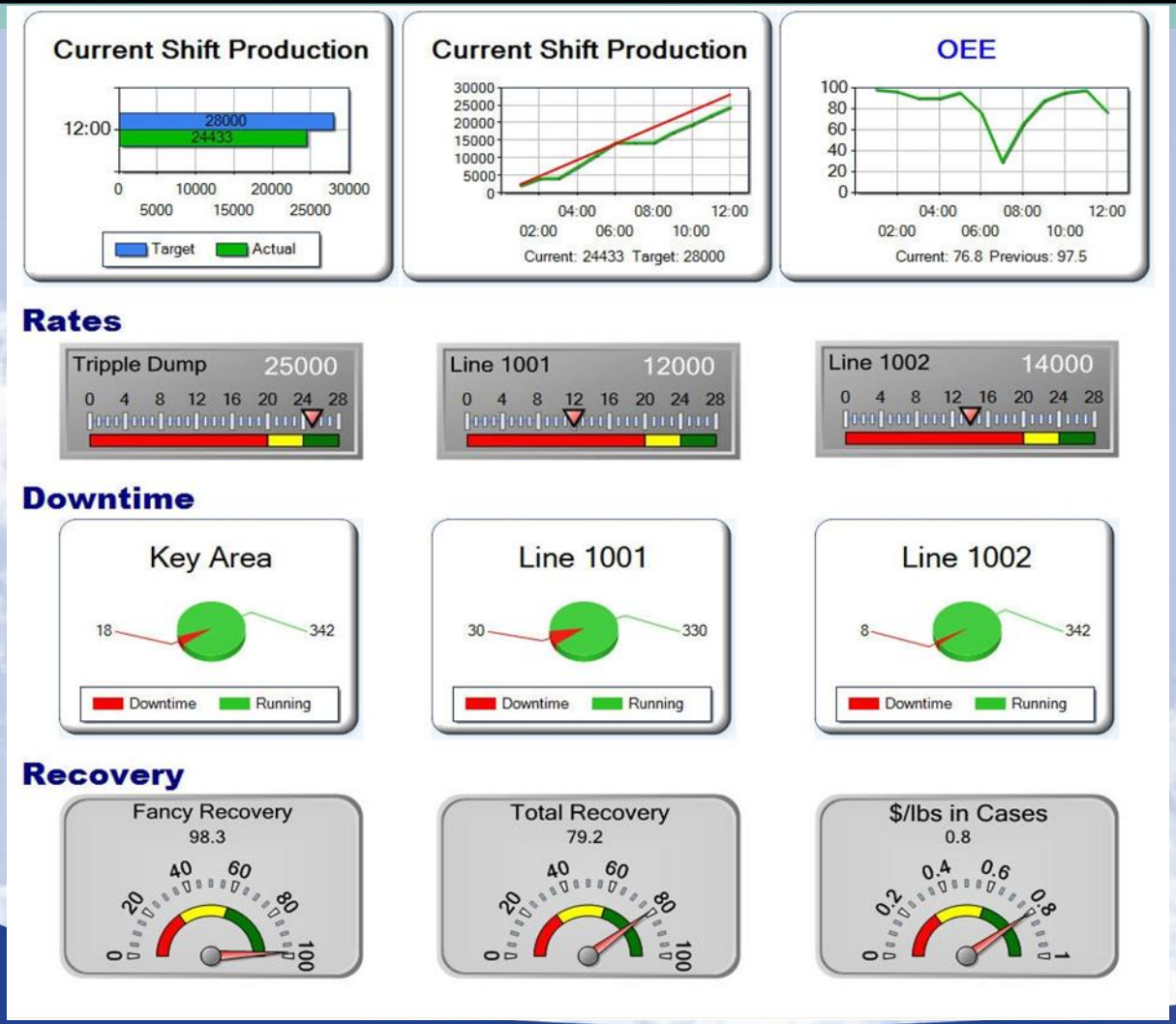
Real-time Downtime, Uptime & Event Tracking



Sample KPIs

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Solution Description

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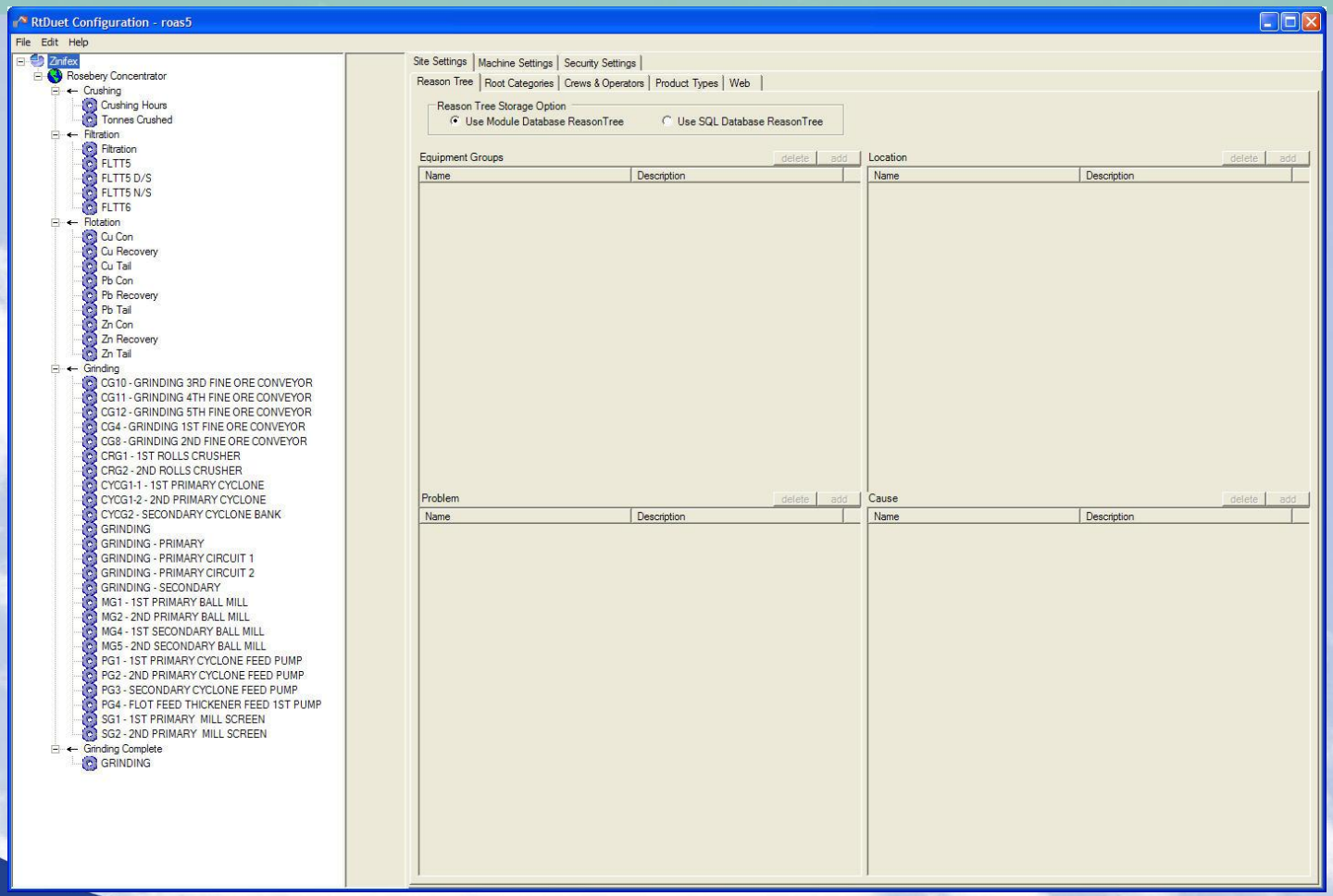
Real-time Downtime, Uptime & Event Tracking



Configuration Toolset

- Easy to Use
- Make changes on the fly
- Standardize Downtime terminology

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Benefits

RtDuet™
Real-time Downtime, Uptime & Event Tracking

- Large, fast ROI
  - RtDuet provides real information to improve your bottom line results.

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Resulting Benefits

- Sample calculation measuring ROI in mining:

  A mill experienced 200 hours of downtime on a mill chute in 2006.

  By automating and properly analyzing their downtime tracking:

  - **If the mill is running x tons per hour at y grade with z recovery and a profit margin of a:**
  - **200 hours by x by z by a**
  - **360 LTPH * 200 hours * 36.5% WR * $20 margin**
  - **= $525,600**
  - **If mill can reduce this by 25 %, annual net savings are $ 131,400.**
  - **ROI = Annual Net Savings / Project costs x 100%**
  - **= $ 131400 yr / $ 58307**
  - **= 225 %**
  - **Payback Period = $ project cost / $ annual per year**
  - **= .44 years or 5.3 months**

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Resulting Benefits

- Sample calculation measuring ROI in mining:

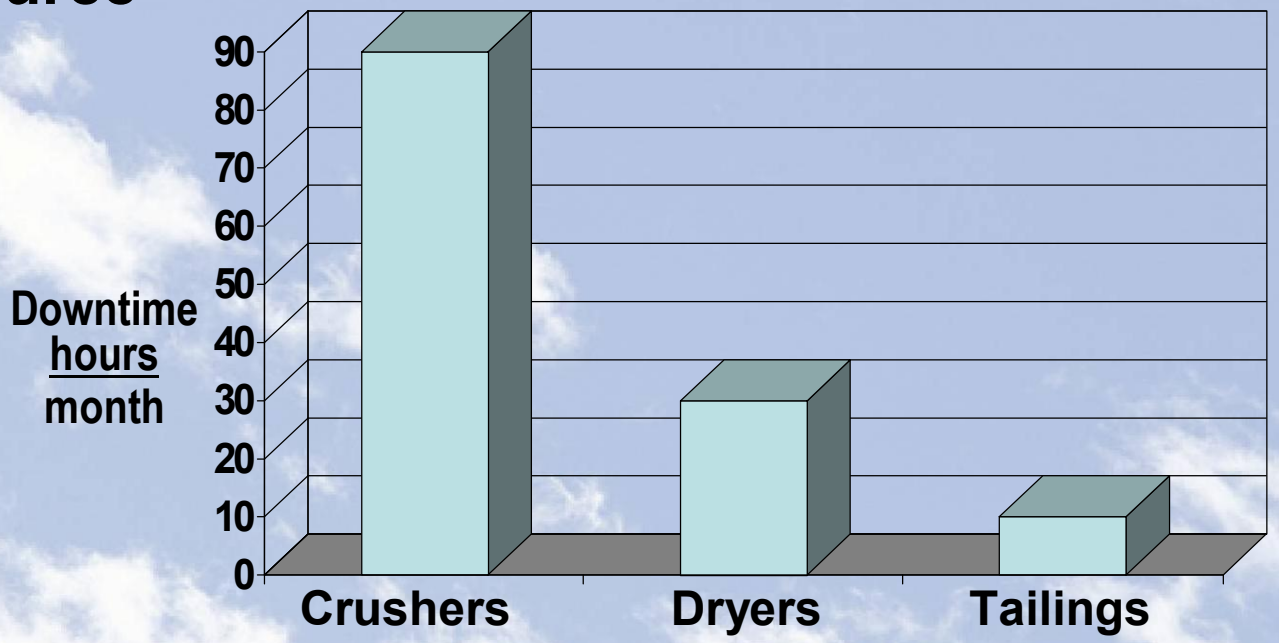
Result of 0.1 % of additional asset availability at Wabush Mines in Point Noir, QC:

SUMMARY			
	OLD	NEW	DIFF
Availability Target	92.6%	92.7%	+ 0.1%
Annual Production Target (3 Lines)	6100000 Tons	6106587 Tons	+ 6587 Tons
Pellets US$/Ton	$ 35.00	$ 35.00	0
Annual Forecast	$ 213,500,000	$ 213,730,561	+ $ 230,561

Cost of Downtime System $ 75,000 (Negligible)

Benefits

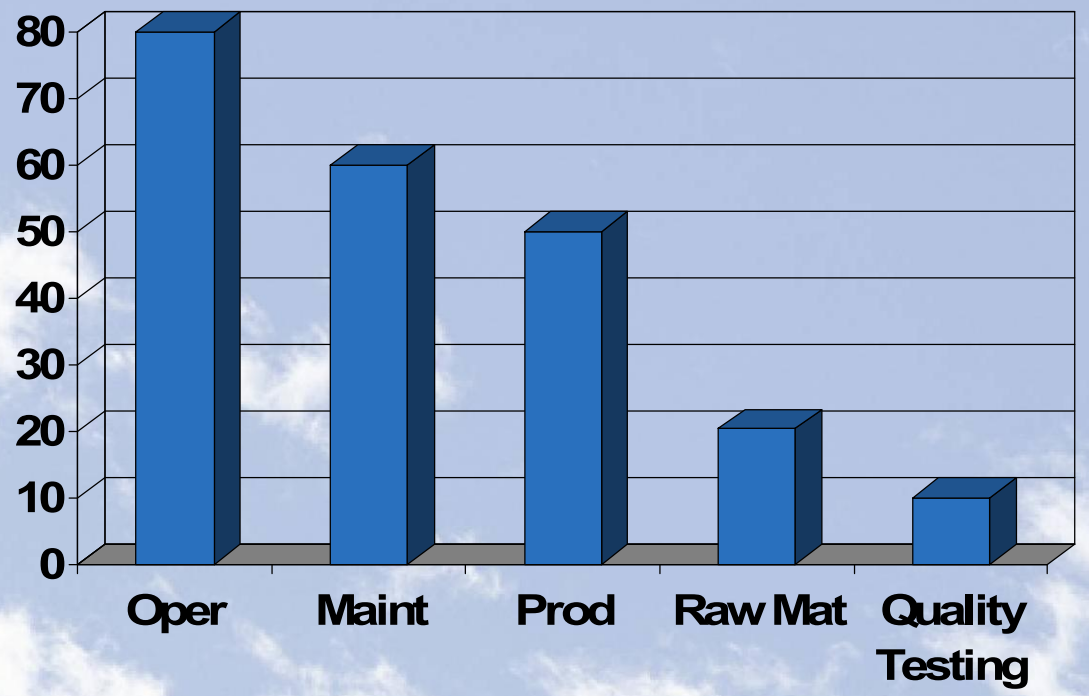
Improve Resource Allocation



Instead of having plant resources focus on small problems, using RtDuet you can to accurately assign resources and target the top 10 causes of DT and areas for improvement and cost savings.

Benefits

Eliminate Squeaky Wheel Syndrome



Quality Testing Dept. MAY BE THE "SQUEAKY WHEEL", BUT NOT THE BIGGEST PROBLEM

Using RtDuet you can accurately assign responsibility and solutions.

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Future Plans

- Plans to test with AF 2.0 prior to release
- Planned Integration with SAP Preventative Maintenance Module.

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Thank You

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