Operational States Downtime Reporting

Presented by

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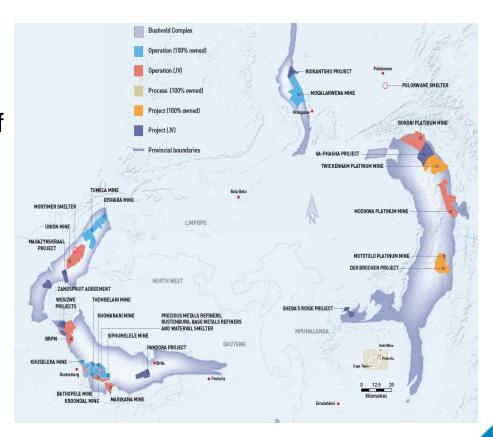Anglo American Platinum

Agenda

- About Anglo American Platinum
- Downtime Reporting
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    - Requirements
- Operational States
    - Solution Overview
    - OSIsoft Software and Services Used
    - PI System Architecture
- Results
    - Generator – PI ACE
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    - Report
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- Future Plans

About Anglo American Platinum

Anglo American Platinum is the world's premier PGM producer, supplying approximately 40% of the world's newly refined platinum.

Process Division:

- 14 Concentrators

- 3 Smelters

- 1 Converter

- 2 Refineries

- 9 geographic operational areas

Business Challenge / Problem Addressed

- The PI System has been implemented and mainly used for production reporting
  - Needed to add more value
- Downtime reporting
  - Every-day task
  - It is time consuming
  - Universally performed on all sites
  - It is what you monitor to make the assets "sweat"
- Are we getting maximum benefits from this?
- Every site has:
  - Their own Downtime Reporting method
  - Their own reason lists
  - Done using Excel Spread Sheets, with no time continuity

Requirements

- Need one system
- Simple and intuitive user interface
- Fast searching capability
- Ability to perform diverse filtering
- No client installs
- Easy to roll out
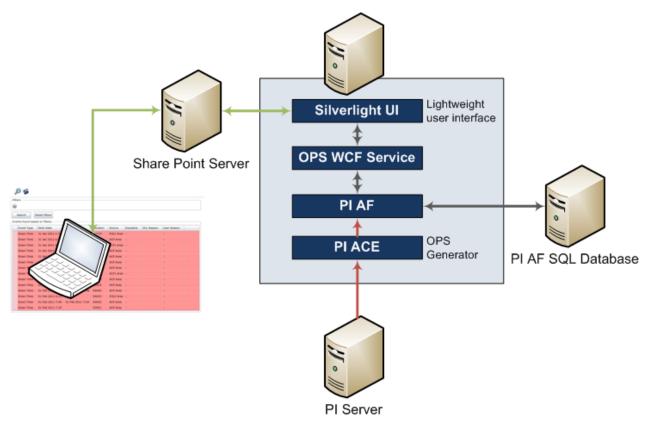- Configurable
- Change insensitive

Operational States (OPS) – In Event Frames

- Use PI AF Events to frame downtimes
  - But this progressed to a generic system that can generate events on any plant state
- Operational States – 2 components
  - State Generator (PI ACE)
    - Creates the downtime (etc.) events by watching plant data as it is logged by the PI Server
    - There are a set or rules defining the creation and event life
  - User interface (Microsoft Silverlight)
    - Used to add user information to events
    - Provides simple reporting
    - Web based, using Microsoft Silverlight and SharePoint
    - Communicates with PI AF using a Windows Communication Foundation (WCF) service

OSIsoft Software and Services Used

- Enterprise Agreement (EA)
  - 7 sites currently covered, 2 roll outs in 2011…

- PI Advanced Computing Engine (PI ACE)
  - Used as the state generator. Monitors event data and creates PI AF Events

- PI AF
  - Uniquely suited with the searching and reference ability
  - Uses the Event Features

- PI AF SDK
  - Used to interact programmatically with PI AF

PI System Architecture

Silverlight UI — Lightweight user interface

OPS WCF Service

PI AF

PI ACE — OPS Generator

Share Point Server

PI AF SQL Database

PI Server
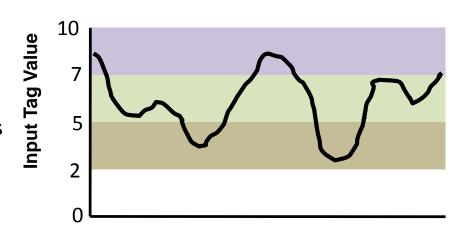
Results

- One site is currently generating ~ 20 events a day

- Building and deploying in versions

    - Shape future enhancements with user feedback

- Events have a Generator and Origin

    - Generator – Equipment that was effected (stopped)

    - Origin – Equipment that caused the effect (downtime)

- Can search by Dates, equipment names, equipment templates and user entered reasons

Results cont.

- Searches and returns 20 events in under 2 seconds

- System can be used for Downtime, Slowtime, KPI's; anything that can be configured

- Uses PI AF templates, Enumerated Sets and Element References; so it is flexible
  - Names and the Asset structure can be changed at any time

Generator – PI ACE

Can perform any or all the actions below;
   Create a PI AF Event
   Write event times and duration to PI Tags

Input Tag Value

10

7

5

2

0

Example: Use any or all of the conditions below;
   Create Event When > 7   **with template A**
   Create Event When < 5   **with template B**
   Create Event When between 5 and 7   **with template C**
   Create Event When not between 5 and 7   **with template D**
   Create Event When = "Digital State"   **with template E**
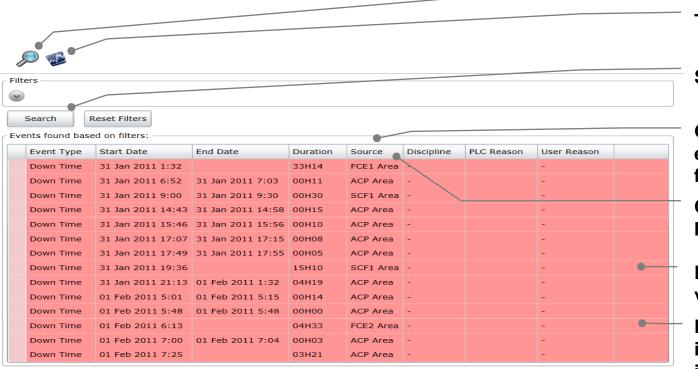
User Interface – Landing Screen

To Search Screen
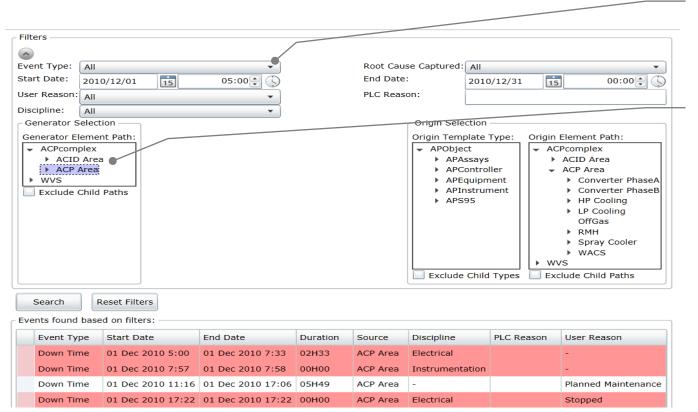
To Report Screen

Search on filters

Grid view of events matching filter criteria

Click column header to order

Double click Event to view and edit
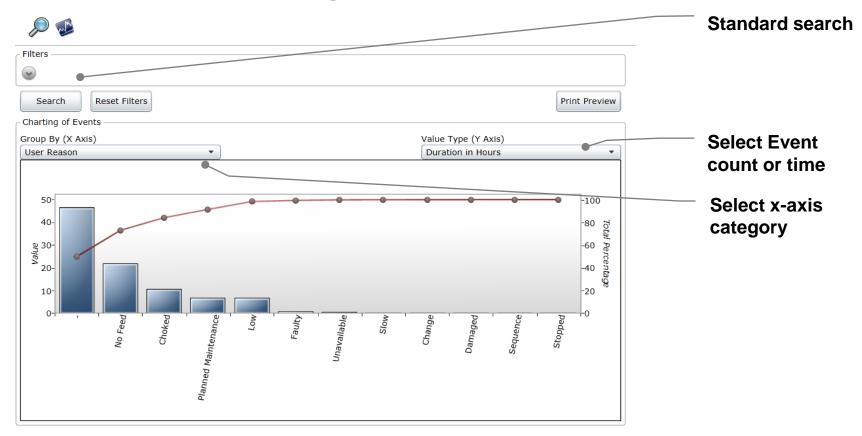
Event colour indicates if information is captured

Filters

Search | Reset Filters

Events found based on filters:

Event Type	Start Date	End Date	Duration	Source	Discipline	PLC Reason	User Reason	
Down Time	31 Jan 2011 1:32		33H14	FCE1 Area	-		-	
Down Time	31 Jan 2011 6:52	31 Jan 2011 7:03	00H11	ACP Area	-		-	
Down Time	31 Jan 2011 9:00	31 Jan 2011 9:30	00H30	SCF1 Area	-		-	
Down Time	31 Jan 2011 14:43	31 Jan 2011 14:58	00H15	ACP Area	-		-	
Down Time	31 Jan 2011 15:46	31 Jan 2011 15:56	00H10	ACP Area	-		-	
Down Time	31 Jan 2011 17:07	31 Jan 2011 17:15	00H08	ACP Area	-		-	
Down Time	31 Jan 2011 17:49	31 Jan 2011 17:55	00H05	ACP Area	-		-	
Down Time	31 Jan 2011 19:36		15H10	SCF1 Area	-		-	
Down Time	31 Jan 2011 21:13	01 Feb 2011 1:32	04H19	ACP Area	-		-	
Down Time	01 Feb 2011 5:01	01 Feb 2011 5:15	00H14	ACP Area	-		-	
Down Time	01 Feb 2011 5:48	01 Feb 2011 5:48	00H00	ACP Area	-		-	
Down Time	01 Feb 2011 6:13		04H33	FCE2 Area	-		-	
Down Time	01 Feb 2011 7:00	01 Feb 2011 7:04	00H03	ACP Area	-		-	
Down Time	01 Feb 2011 7:25		03H21	ACP Area	-		-	

User Interface – Search Menu

Select Filters

PI AF Asset Tree, for equipment selection and Filtering

User Interface - Report

Standard search

Select Event count or time
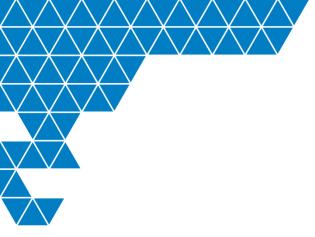
Select x-axis category

Benefits

- Time saving
  - No need to maintain an Excel Sheet and to manually complete all the information
- Commonality
  - The same templates and reasons across all sites
- Continuous
  - Will store years of events for comparison
- Can display the event data in many ways
  - Seasonal analysis
  - Equipment type analysis
  - Feed types analysis

Future Plans and Next Steps

- More Rollouts, entrench current usage

- Incorporate feature enhancements

- Integrating with a Plant Comment System

- Expand to Enterprise Reporting

- Process Diary

Questions / Contact Information

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Thank you