



# Integrating Plant and Process Data for Improved Operational Efficiency and Plant Safety

Presented by **Jim Ross**  
**Jon Howard**



# Agenda

- **Webinar Series and Partner Solution Showcase**
- **Introduction**
- **PI System at Scottish Power Generation**
- **Business Requirement - Reduce the risk of a major Process Safety Incident occurring within SP Generation**
- **How SP Generation used Opralog to help meet this challenge**
- **Demo of Opralog by Scottish Power Generation and Infotechnics**
- **Questions**
- **Conclusions and Thank You**

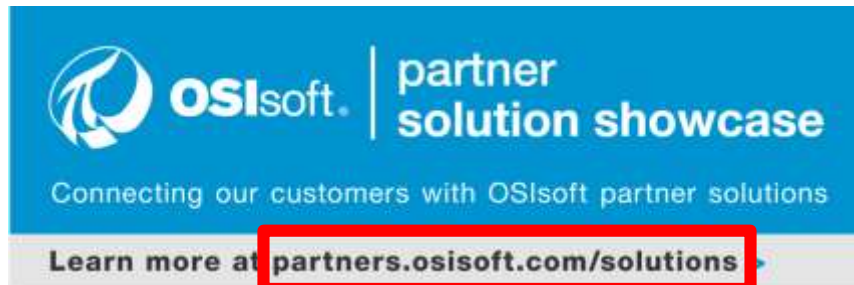
# Mission



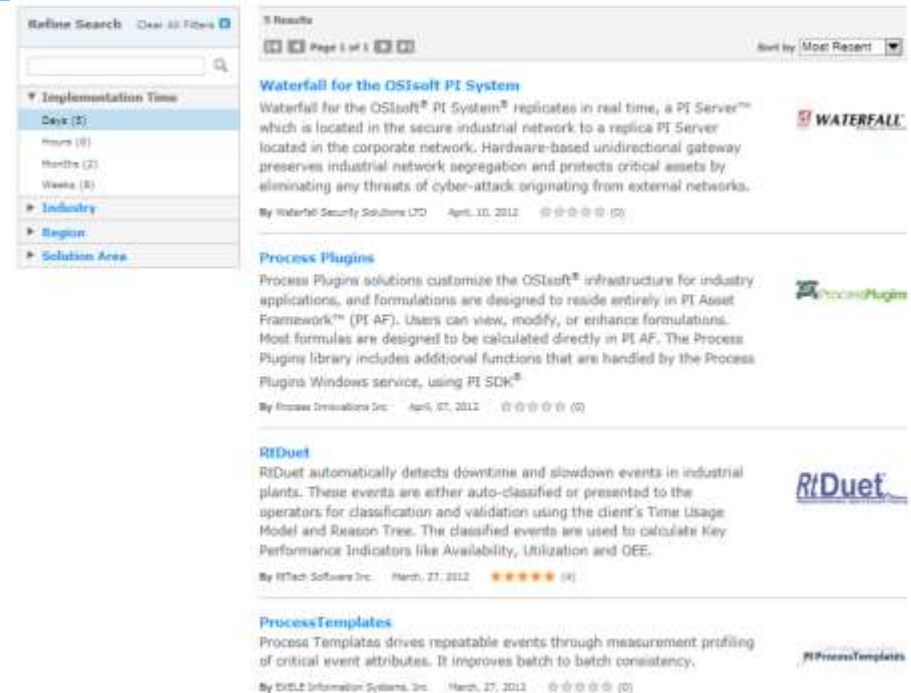
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# Partner Program Manager will inset Customer Introduction slide here

- Information about customer
- Mission
- Website
- Logo
- Etc

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# Presenters

- Customer  
Scottish Power Generation
- Partner  
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## Iberdrola Group and ScottishPower

Combined April 2007 to form the 4<sup>th</sup> largest Energy Utility company in the world

Operating in over 40 countries to serve 30 million customers

44GW of installed capacity and a world leading 11 GW of renewables





# ScottishPower Overview

ScottishPower is one of the "Big 6" energy

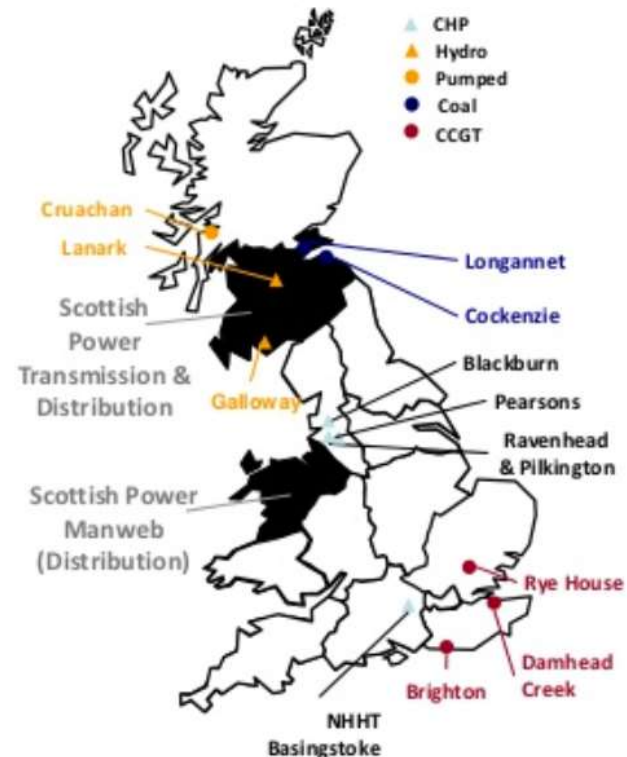
Supply 5.2 million customers

Over 8,000 employees

7GW of coal, gas, wind & hydro generation across the UK

SP Renewables largest onshore wind operator in UK (1200 MW)

Distribution area of over 35,000 square kilometres



**In response to a series of worldwide Process Safety incidents  
ScottishPower Generation developed an Operational Transformation  
Program.**

- **Piper Alpha**
- **Buncefield**
- **Texas City**
- **Deepwater  
Horizon**
- **Esso  
Longford**

**Reduce the risk of a  
major Process Safety  
Incident occurring  
within SP Generation**

# Shift Handover / Reporting Recognised as a RISK

## Operations Management Project Stream

Establishment of common practices across all sites ensuring that all plant is operated within design parameters and in accordance with agreed procedures.

Reconciling satellite spread sheets, black book data, disparate databases & numerous paper logs

# Operational Logging

**Objective** – having front line operators who strive to maintain situational awareness, being highly informed about operations as a whole, not being 'siloed' within their own small sphere of influence

- Automate Event Capture
- Reduce Operator Workload
- Improve Data Reliability
- One Version of the Truth

# Added Value

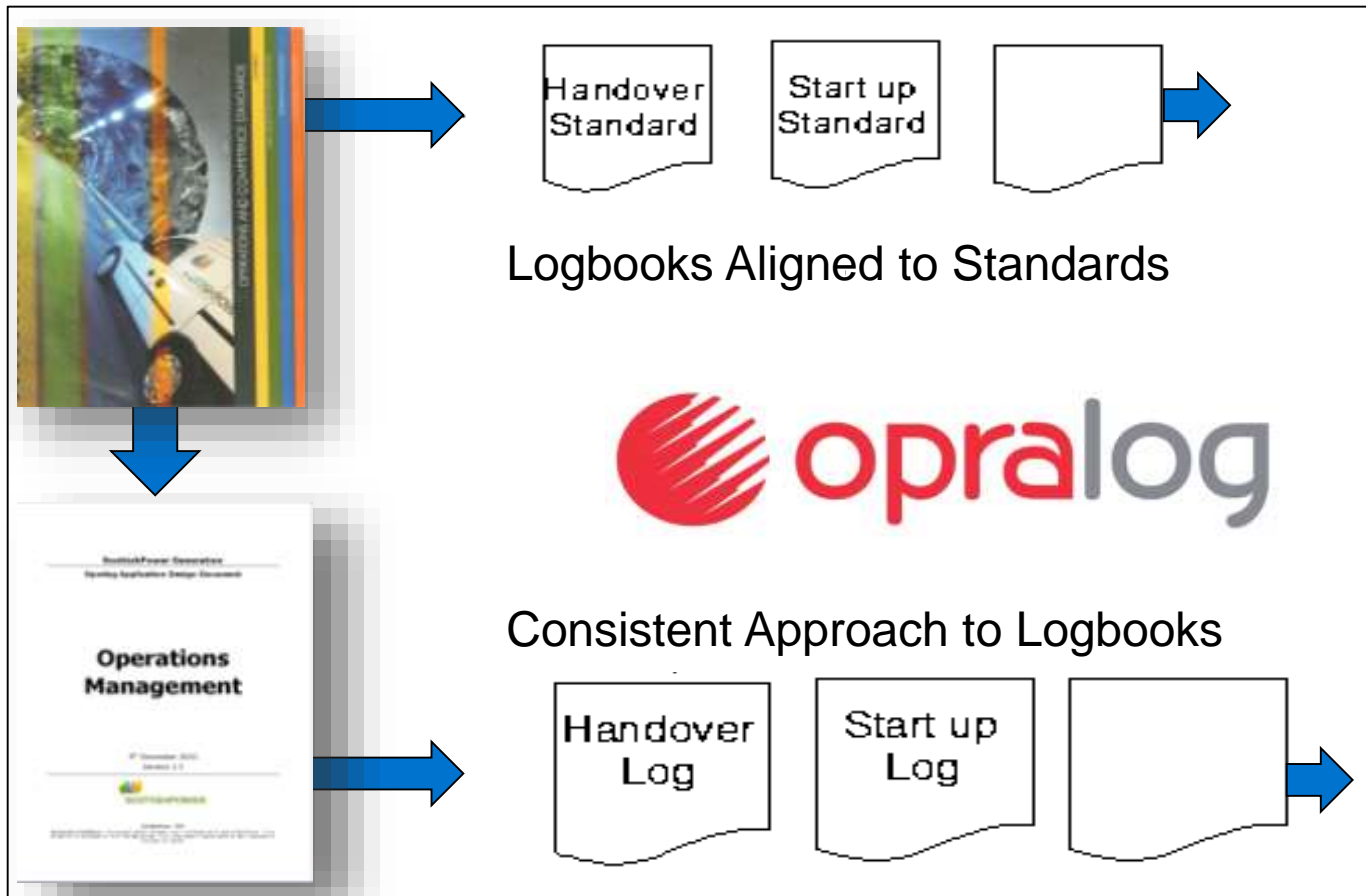
## The PI System told us what happened but not always WHY

Greater knowledge of prevailing plant status and significant events allow speedier and more informed interpretations of the “hard” performance data obtained through the PI System.

# Operations Management Project

- Opralog was implemented across all (11) UK generation plants
- A Bi-directional interface to OSIsoft PI System enables events to be triggered automatically depending on specific data values.
- Time Series PI Data can also be associated with logged events in Opralog giving it context and also making it more visible to users throughout the business
- The Standard Opralog Interface allows connections to other systems such as SAP and IBM Maximo thereby providing operators with all of the operational information they require in the one place

# Opralog Configured Around the Operational Standards



# Integrated Operations

Integration between plant systems was key

A single view of operations from one screen / system

Need to integrate time series data with manual input from operators and other plant systems

- **OSIsoft PI System**
- CMMS (Maximo)
- Incident Management (Cintellate)
- Alarm Management (PAS)
- ISSOW (Eclipse)



# Automated data entry triggered from the PI System

Logbook Events				Times	triggered from the PI System		
Safety And Environmental				03-Nov-2011 08:32	Boiler, Mill Groups, F MILL GROUP, F COAL FEEDER, IN SERVICE	Auto Logger	03-Nov-2011 08:32
Commercial				03-Nov-2011 08:32	Boiler, Mill Groups, F MILL GROUP, F MILL, IN SERVICE	Auto Logger	03-Nov-2011 08:32
Maintenance work in progress				03-Nov-2011 08:32	Boiler, Mill Groups, A MILL GROUP, A COAL FEEDER, IN SERVICE	Auto Logger	03-Nov-2011 08:32
Permit for Work Handover Info				03-Nov-2011 08:01	U1 Start Up, Warm 2 Start, Unit 1 On Load	Alistair Mcleod	03-Nov-2011 08:01
Work Order Cards Created				03-Nov-2011 07:36	Boiler, Mill Groups, D MILL GROUP, D PA FAN, IN SERVICE	Auto Logger	03-Nov-2011 07:36
Unit 1 Trip				03-Nov-2011 07:36	Boiler, Mill Groups, C MILL GROUP, C PA FAN, OUT OF SERVICE	Auto Logger	03-Nov-2011 07:36
Status Of Plant				03-Nov-2011 06:55	Status Of Plant	Alistair Mcleod	03-Nov-2011 06:55
U1 Start Up				03-Nov-2011 06:30	Boiler, Mill Groups, E MILL GROUP, E PA FAN, IN SERVICE	Auto Logger	03-Nov-2011 06:30
Cold Start				03-Nov-2011 06:27	Boiler, Mill Groups, F MILL GROUP, F PA FAN, IN SERVICE	Auto Logger	03-Nov-2011 06:27
Warm 1 Start				03-Nov-2011 06:27	Boiler, Mill Groups, C MILL GROUP, C PA FAN, IN SERVICE	Auto Logger	03-Nov-2011 06:27
Warm 2 Start				03-Nov-2011 06:27	Boiler, Mill Groups, B MILL GROUP, B PA FAN, IN SERVICE	Auto Logger	03-Nov-2011 06:27
Hot Start				03-Nov-2011 06:27	Boiler, Mill Groups, A MILL GROUP, A PA FAN, IN SERVICE	Auto Logger	03-Nov-2011 06:27
U1 Shutdown				03-Nov-2011 06:25	Boiler, Draught Plant, ID Fans, "B" ID Fan, In Service	Auto Logger	03-Nov-2011 06:25
Boiler				03-Nov-2011 06:25	Boiler, Draught Plant, ID Fans, "A" ID Fan, In Service	Auto Logger	03-Nov-2011 06:25
Alternator				03-Nov-2011 06:25	Boiler, Draught Plant, FD Fans, B FD Fan, In Service	Auto Logger	03-Nov-2011 06:25
Turbine				03-Nov-2011 06:25	Boiler, Draught Plant, FD Fans, A FD Fan, In Service	Auto Logger	03-Nov-2011 06:25
LP Feed System				03-Nov-2011 06:06	U1 Start Up, Hot Start, Boiler Stop V/V's opened	James Dobbie	03-Nov-2011 06:06
HP Feed System				03-Nov-2011 06:06	U1 Start Up, Hot Start, RAPs In service	James Dobbie	03-Nov-2011 06:06
Condensate System				03-Nov-2011 06:06	U1 Start Up, Hot Start, Gland Steam Extractor Fans In Service	James Dobbie	03-Nov-2011 06:06
Aux Cw System				03-Nov-2011 06:06	U1 Start Up, Hot Start, Chest Warming On	James Dobbie	03-Nov-2011 06:06
Electrical Systems				03-Nov-2011 06:06	U1 Start Up, Hot Start, Turbine Stop V/V's cracked	James Dobbie	03-Nov-2011 06:06
Chemistry				03-Nov-2011 06:06	U1 Start Up, Hot Start, LP Hood Sprays On	James Dobbie	03-Nov-2011 06:06
Control Systems				03-Nov-2011 06:00	Status Of Plant	Event Scheduler	03-Nov-2011 06:00
Common Plant				03-Nov-2011 06:00	Plant Controller Handheld Routines	Event Scheduler	03-Nov-2011 06:00
Relief Unit Controller				03-Nov-2011 06:00	HP Feed System, MBPT	Phillip Wilson	03-Nov-2011 06:00
Unit Periodic Routines				03-Nov-2011 06:00	Boiler, Mill Groups, E MILL GROUP, E COAL FEEDER	David McLeod	03-Nov-2011 06:00
Plant Controller Daily Routines				03-Nov-2011 06:00	Alternator, H2 Birlec Drier.	Phillip Wilson	03-Nov-2011 06:00
Plant Controller Handheld Routines				03-Nov-2011 06:00	Common Plant	Gerald Codona	03-Nov-2011 06:00
				03-Nov-2011 06:00	Alternator	Gerald Codona	03-Nov-2011 06:00
				03-Nov-2011 06:00	Boiler, General	Peter Hillhouse	03-Nov-2011 06:00
				03-Nov-2011 06:00	Work Order Cards Created	John Talman	03-Nov-2011 06:00
				03-Nov-2011 06:00	Turbine, Defects	Martin Quinn	03-Nov-2011 06:00

# Automated events from Maximo

The screenshot displays the Maximo Logbook Events interface. On the left, a sidebar lists navigation options: Unit 1, Unit 2, Unit 3, Unit 4, Common Plant, and LT Unmatched Defects. The main window shows a table of events with columns for Time Stamp, Logbook Entry, Summary, Event Type, and Event Date. One event is highlighted in green.

Time Stamp	Logbook Entry	Summary	Event Type	Event Date
03-Nov-2011 12:45	Common Plant	LT11/106299, W/SAP, CP NO 11 CONV CHUTE NO 11 TO 13 AND 15 CONV FLAP VALVE. WELD AN EXTERNAL PATCH TO CHUTE.	Auto Logger	03-Nov-2011 12:45:34 03-Nov-2011
03-Nov-2011 12:42	Common Plant	LT11/106294, W/SAP, TW RECIRC TANK'S COMMON OVERFLOW P/WORK: REPLACE CORRODED SECTION OF PIPE IN DOMESTIC WATER PUMP HOUSE.	Auto Logger	03-Nov-2011 12:42:34 03-Nov-2011
03-Nov-2011 12:41	Common Plant	LT11/103564, COMP, CP NO 11 CONV: CARRY OUT QUARTERLY MECHANICAL ROUTINE INSPECTION OF CONVEYOR DRIVE.	Auto Logger	03-Nov-2011 12:41:35 03-Nov-2011
03-Nov-2011 12:40	Unit 2, U2 Boiler and Combustion Systems	LT11/106257, SAPD, 2A MILL GRAY FEEDER CARRY OUT CALIBRATION PRINTER BY MINOR PUMP AS PFR 1MP.	Auto Logger	03-Nov-2011 12:41:34 03-Nov-2011

Below the table, the 'Additional Information' tab is selected, showing details for the highlighted event (Document No: 201106770).

Document No	201106770
Type	PFV
Status	ISSUED
Authorised By	EP030844
WOC URL	http://0.8.1.235:7003/maximo/ul/maximo.jsp?event=loadapp&value=wotrack&uniqueid=1657714
RKS No	09ECC11
WOC No	LT11/03564
WOC Description	CP NO 11 CONV: CARRY OUT QUARTERLY MECHANICAL ROUTINE INSPECTION OF CONVEYOR DRIVE.
Parent WOC No	
WOC Status	COMP
Status Date	03-11-11 12:40
WO Type	PM
WO Sub Type	
WO Location Priority	S
WO Priority	1
Calculated Priority	S
Owner	
Owner Group	NOREC
Reported By	TC601221

# Events Shared Across Logbooks

The image displays three overlapping screenshots of the OSIsoft Logbook software interface, demonstrating how events are shared across different logbooks. The top window, titled "Logbook: CK Unit1 Handover - Day03 November 2011 (starting Thursday, Nov 3, 2011 08:00)", shows a "Commercial" event at 03-Nov-2011 08:01. The middle window, titled "Logbook: CK Performance - Day03 November 2011 (starting Thursday, Nov 3, 2011 08:00)", shows a "UNIT 1" event at 03-Nov-2011 08:01. The bottom window, titled "Logbook: CK Shift Manager Handover - Day03 November 2011 (starting Thursday, Nov 3, 2011 08:00) (Report Locked)", shows a "Unit 1" event at 03-Nov-2011 08:01 and a "Turbine / Alternator" event at 03-Nov-2011 08:00. A green circle highlights the "UNIT 1" event in the middle window, and a green arrow points from this event to the "Unit 1" event in the bottom window, illustrating the sharing of events across logbooks. The bottom window also shows a "UNIT PLANT STATE" table with columns for STATE, HP METAL TEMP, and ADDITIONAL COMMENTS.

**Logbook: CK Unit1 Handover - Day03 November 2011 (starting Thursday, Nov 3, 2011 08:00)**

Shift Summary Information:

Shift: Day03 November 2011

Start: 03-Nov-2011 06:00 am

End: 03-Nov-2011 12:00 pm

Locked: Yes :- at 03-Nov-2011 12:40 pm

Signed off: No

Log Period:

**Commercial**

03-Nov-2011 08:01 Unit 1 Start Up, Warm 2 Start, Unit 1 On Load

**Logbook: CK Performance - Day03 November 2011 (starting Thursday, Nov 3, 2011 08:00)**

Shift Summary Information:

Shift: Day03 November 2011

Start: 03-Nov-2011 08:00 am

End: 03-Nov-2011 02:00 pm

Locked: Yes :- at 03-Nov-2011 01:38 pm

Signed off: Yes :- at 03-Nov-2011 02:06 pm

Log Period: Days

**UNIT 1**

03-Nov-2011 08:01 Unit 1, Availability Restrictions

Original Timestamp: 14-Sep-2010 08:52

03-Nov-2011 08:01 Unit 1 Start Up, Warm 2 Start, Unit 1 On Load

**Logbook: CK Shift Manager Handover - Day03 November 2011 (starting Thursday, Nov 3, 2011 08:00) (Report Locked)**

Shift Summary Information:

Shift: Day03 November 2011

Start: 03-Nov-2011 08:00 am

End: 03-Nov-2011 02:00 pm

Locked: Yes :- at 03-Nov-2011 01:38 pm

Signed off: Yes :- at 03-Nov-2011 02:06 pm

Log Period: Days

**Unit 1**

03-Nov-2011 08:01 Unit 1, Availability Restrictions

Original Timestamp: 14-Sep-2010 08:52

03-Nov-2011 08:01 Unit 1 Start Up, Warm 2 Start, Unit 1 On Load

**Turbine / Alternator**

03-Nov-2011 08:00 Unit 1, Turbine / Alternator, Event

Original Timestamp: 31-Oct-2011 09:58

Driven phase marker Failed from 6%

Additional Information Attachments

**UNIT PLANT STATE**

STATE	HP METAL TEMP	ADDITIONAL COMMENTS
ON-LOAD		On Load 08:00 Hot start



# Real-time Data from the PI System Associated with Logged Events

Logbook: DC STE Handover - 03-11-2011 Nights (sta)

Logbook Structure

- Health & Safety/Process Safety
- Environment
- Key Operational Events
- Plant & Commercial Status
- Critical & Emergency Systems
- OMS & Routines
- Work Orders Raised
- Safety Document Status
- Blocks, Forces & Overrides
- Shift Information
- Shift Handover Summary

Shift Summary Information

Shift: 03-11-2011 N  
Start: 03-Nov-2011  
End: 04-Nov-2011

## Plant & Commercial Status

### Module Status

04-Nov-2011 06:00 Plant & Commercial Status, Module Status, Plant Status at 06:00/18:00

### Commercial Status

04-Nov-2011 06:00 Plant & Commercial Status, Module Status, Plant Status at 06:00/18:00

Additional Information Attachments

#### Plant Status at 06:00/18:00

##### Environmental

	GT1 Ilox (mg/M3)	GT2 Ilox (mg/M3)	W/Water (pH)	W/Water (deg C)	Ambient (deg C)	Ambient (mbar)	Wind (M/s)
Max (12h)	39.6	45.0	8.2	19.0	15.6	993	10.3
Current	28.2	31.3	7.7	14.9	13.6	992	6.4
Min (12h)	26.2	20.7	7.6	14.7	13.5	989	1.6

##### Generation

	MEL (MW)	Output (MW)	PII (MW)	SEL (MW)	Freq (Hz)	Reac (MVARs)	GT1 (MW)	GT2 (MW)	ST (MW)
Max (12h)	785.0	745.1	750.0		50.15	49.7	259.7	257.2	250.9
Current	785.0	713.4	700.0	500.0	49.96	-257.6	245.1	246.3	217.1
Min (12h)	785.0	598.5	657.0		49.82	-333.5	203.2	205.0	200.0

##### BOP

Cond MU (12hr Ave)	3.52
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<< Previous Report      Next Report >>      Report View      Documentation Library      Search Entries

Refresh in 9 min 54 sec

# Business Reports with Data from Multiple Logbooks



## Generation Report

03-11-2011

### Plant & Commercial Status

#### Gas Group

04Nov 06:15

Gas Group Plant Status				
	Damhead	Rye House	Shoreham	
LOAD	638	-2	305	
MEL	785	610	385	
PN	657	0	315	
Amb Temp (oC)	14	13	17	
Amb Pressure (mB)	992	986	991	

#### Coal Group

04Nov 06:15

Coal Group Plant Status								
	LT U1	LT U2	LT U3	LT U4	CK U1	CK U2	CK U3	CK U4
LOAD	475	560	548	0	227	209	0	223
MEL					230	210	0	225
MILL AVAILABILITY	7	7	8	8				
Smoke Density	16.2	24.7	13.6	0.0				
Chimney NOx	440	473	454	0	599	397	624	845
BACK PRESSURE (mb)	48	64	54	0	40	38	0	58
MAKE-UP (%)	47	44	28	2				



# Benefits of an Integrated System

- Provide single view for operations and plant status reporting
- Improved shift handover and reliability of information recorded
- Automate event capture and reduce operator workload
- Ensures important plant events do not get missed
- Allows PI Data to be more easily accessible

# Opralog Demonstration

# Summary

An integrated approach to Operations Management is essential

**The PI System tells us WHAT– Opralog tells us WHY**

Supports business drivers of:

Improving plant availability, reliability and cost reduction

Reduces the Frequency and Severity of system failures and their impacts.

Arrange a demo

- [www.infotechnics.co.uk](http://www.infotechnics.co.uk)
- [sales@infotechnics.co.uk](mailto:sales@infotechnics.co.uk)



# Questions?

# Partner Solution Showcase Webinar Series

Date	Title
June 19 <sup>th</sup> , 2013	Magion Universe: Driving Real-time Operational, Process and Workflow Improvements with muSuite and muProMon

# Webinar Recordings

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# Thank you

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