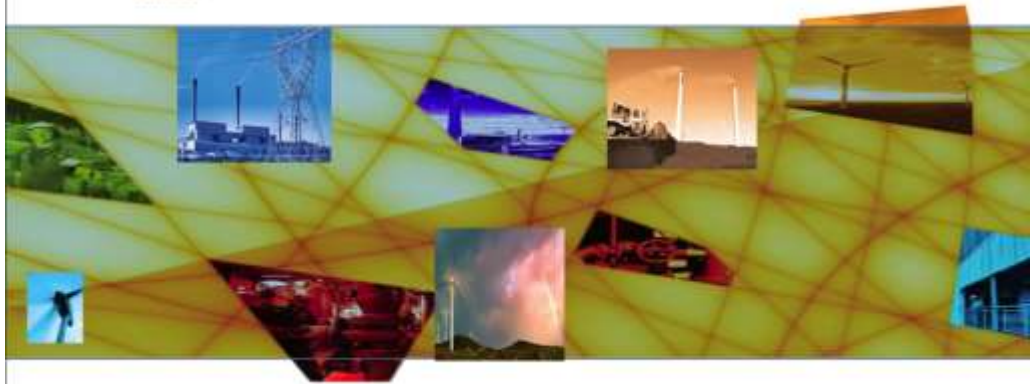# OSIsoft PI System: A Vessel for Change in Verve Energy

Presented by

Francois Mevis, Verve Energy

OSIsoft PI System
A Vessel for Change in Verve Energy

Wednesday, 17 April 2013

Contents

- ‣ Context
  - Company
  - Plant Operational Information Programme
- ‣ Programme set up
- ‣ Technology implementation
- ‣ Business transformation
  - Organising business transformation
  - Benefits realisation
- ‣ Observations
- ‣ Questions and feedback

Verve Energy - Organisation

State owned power generator in Western Australia

- Current company structure established in 2006 after disaggregation of Western Power

- Approximately 620 staff

- 5 major power station and 20 minor, unmanned sites

- Historically site and location focused

▸ Nameplate generation capacity is over 3000 MW

▸ Supply approximately 55% of energy in Western Australia,

▸ Fuel is predominantly coal and gas, with smaller contributions from oil, wind and solar

Verve Energy Portfolio

- 12 Coal fired units
- 18 Gas Turbines
- Wind farms, Wind-diesel units
- Solar farm

Context - Programme

‣ What is the problem?
- Data only accessible on site through different software products
- No integration and no overview over sites
- No easy sharing or implementation of solutions
- Aging workforce - key people will be retiring in next 2 years
- Demand is becoming more challenging; more mid-merid and peak generation

‣ What is the purpose?
- Increase visibility and usability of all operational data through standard toolsets
- "Stop smart people doing stupid work"

Business Case

‣ **Programme justification**
- Increase fuel efficiency
- Optimise asset use and maintenance regimes
- Optimise generation unit dispatch stack
- Record existing operational knowledge and increase accessibility
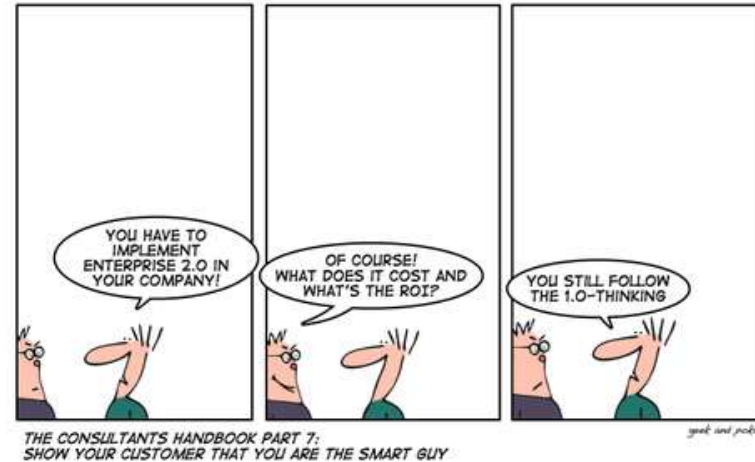
‣ **Approach**
- Establish a central information platform for storing and analysis of operational data
- Establish a 'vessel' for business transformation and benefits realisation

‣ **Business Case Justification**

- Conservative target - **$6.97M savings per year in fuel savings alone**

- Outlook is that more than **$10M savings per year** is realistic

  - increased efficiency

  - optimised maintenance

  - optimised availability – reduced capacity payments for forced outages
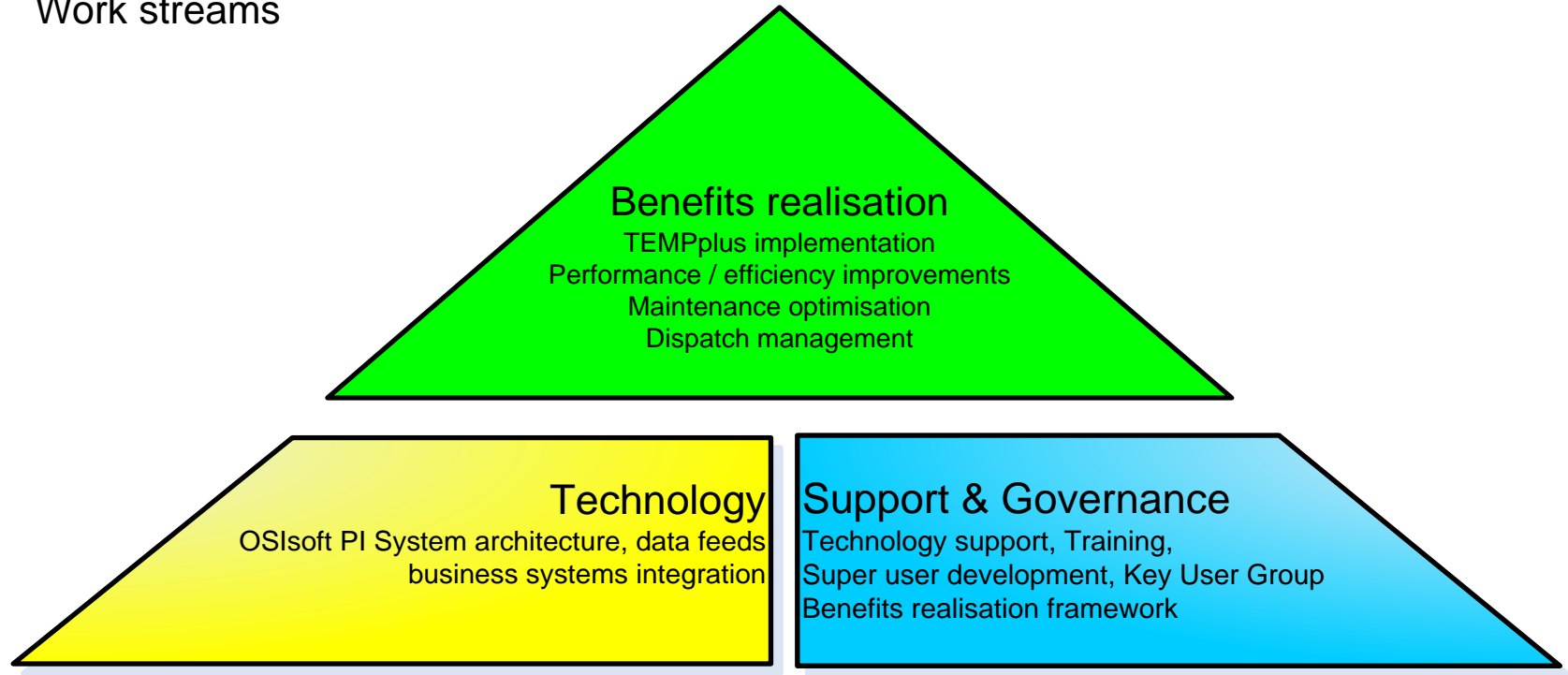
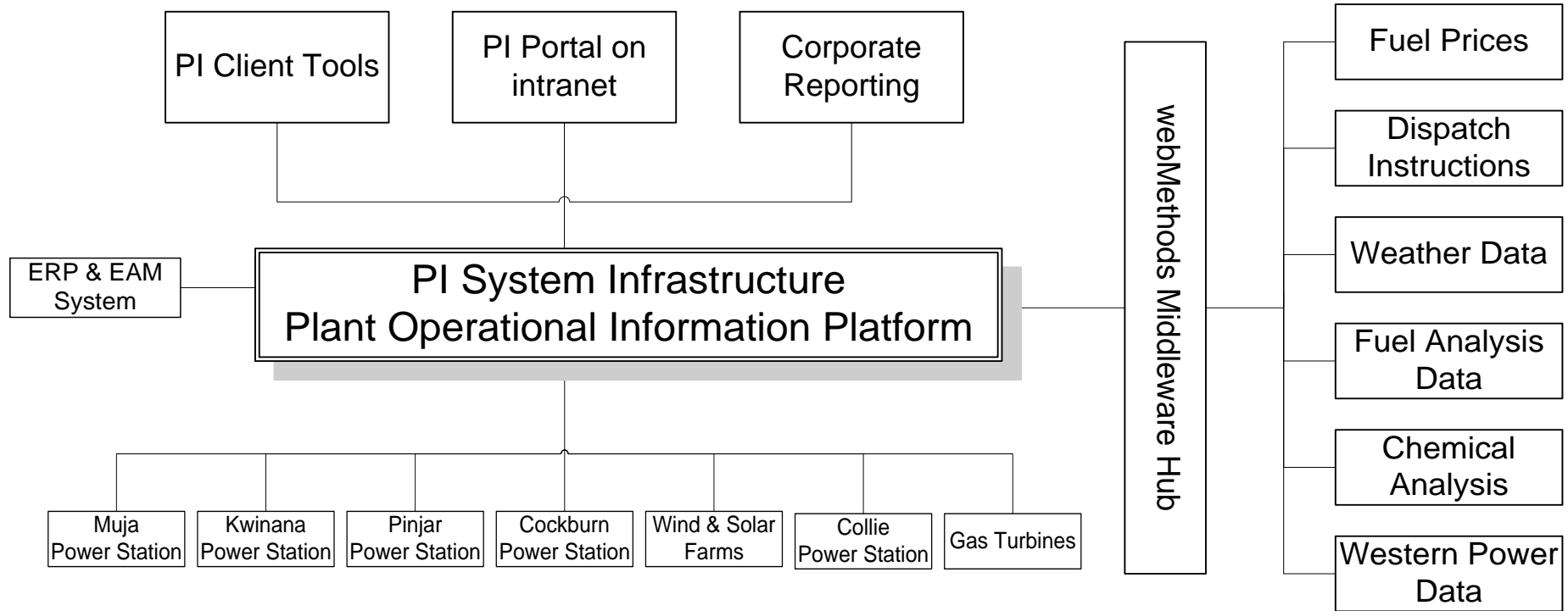☺ **Less than 12 months from installation**

☺ **$2.5M of savings is covered**

☺ **and more in sight!**

Programme Structure

Work streams

Benefits realisation
TEMPplus implementation
Performance / efficiency improvements
Maintenance optimisation
Dispatch management

Technology
OSIsoft PI System architecture, data feeds
business systems integration

Support & Governance
Technology support, Training,
Super user development, Key User Group
Benefits realisation framework

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Technology Implementation

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Business Transformation

Organising Business Transformation

‣ Guiding principal:
"This is foremost a transformational programme, not a technology implementation"

> ➢ **"All about the people"**

‣ Target both hierarchical and functional leaders
- General Managers
- Chief Engineer, Principal & Senior Engineers
- "Informal leaders"

Business Transformation

Governance model

Verve Organisation

- Chief Engineer Office
- Verve Energy Board
  - Operations
  - Trading & Fuel
  - Finance & Services
  - Business Development

Steering Committee

- Chief Operating Officer
  - Chief Engineer
  - General Manager Trading & Fuel
  - Principal Engineer Plant Performance

Programme Manager

Implementation team

Key User Group

- Principal & Senior Engineers
- Trading Analysts
- Finance Analysts
- IT Solution Architect
- Control & Instrumentation Engineers
- Fuel contracts manager

Business Transformation

Organising Business Transformation

- **Approach to functional leaders**
  - Engaged at the start of the programme
  - Trained in use of the system (PI System Visualisation course)

- **Establish 'Key User Group'**
  - Monthly formal meetings
  - Chief Engineer, Principal Engineers, and 'Informal leaders' from Finance, Trading & Fuel and Business Development BU's
  - Align implementation to business requirements
  - Leading in definition of the system, data and user governance framework; and user support structure
  - Identify opportunities for benefits and actively pursue realisation
  - Identify opportunities to re-use solutions in other locations or BU's
  - Ambassadors in the organisation for the programme and the PI system

Business Transformation - KUG

Key User Group input

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Business Transformation - KUG

Key User Group input

Business Transformation - KUG
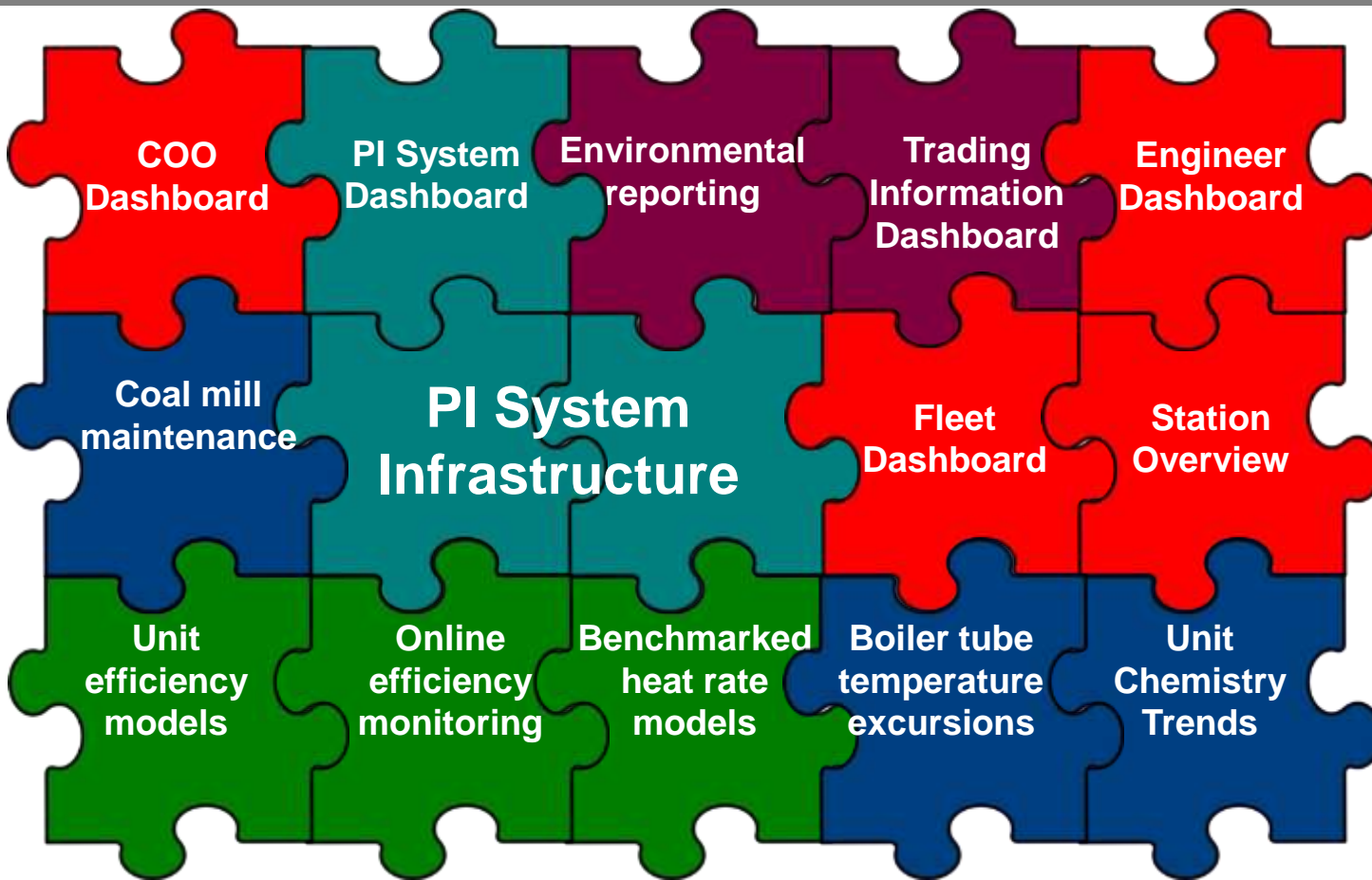
Results Key User Group engagement

‣ 'Rules of Use' are understood and mandated
  - Data and System Governance document is kept alive
  - Governance roles & responsibilities are described in a RACI matrix

‣ Initiatives are appearing in multiple parts of the organisation

‣ Sense of ownership regarding the project and the systems

‣ Fit for use data organisation
  - Asset hierarchy vs Process hierarchy in PI Asset Framework
  - Use of smart tools to allow quick build and change, eg Optimate's AF mapping tool

‣ Critical mass of knowledgeable stake holders
  - The Key User group exists of 17 permanent members
  - Currently 70 people have been trained spread over all relevant business units and locations

Business Transformation - Benefits

‣ Define responsibility and create interest

- Realisation of benefits is embedded in KPI's

- Benefits have 'owners'; the programme structure enables and monitors progress

‣ Enable and support – 'make it easy'

- Periodic user training

- Functional support staff ('super users') are located on all sites

- Existing contractual arrangements with consultancy companies that specialise in the PI System

‣ Create a process for identifying, starting and tracking of initiatives

- All initiatives are tracked against a benefits realisation dashboard

- Programme funds approved initiatives

Business Transformation - Benefits

COO Dashboard	PI System Dashboard	Environmental reporting	Trading Information Dashboard	Engineer Dashboard
Coal mill maintenance	PI System Infrastructure		Fleet Dashboard	Station Overview
Unit efficiency models	Online efficiency monitoring	Benchmarked heat rate models	Boiler tube temperature excursions	Unit Chemistry Trends

Capability Development

PI System Infrastructure & data feeds

Integration with Intranet, create awareness

Explore expert systems:

- Performance Optimisation

- Asset use optimisation, predictive monitoring

Relate other data sources:

- Advanced analysis & process tuning

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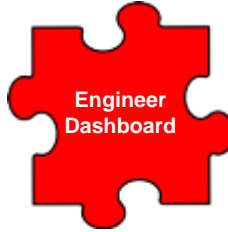
Map overview > Site > Unit > Detail
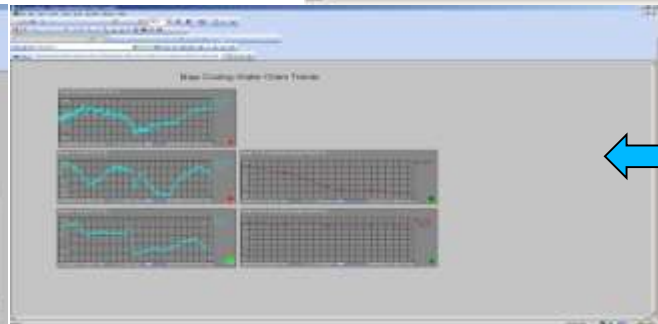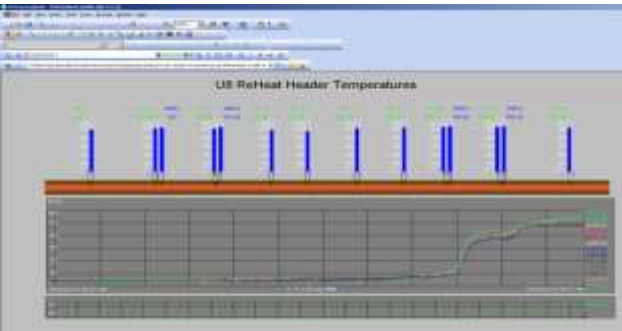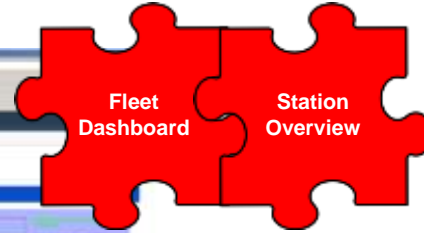
Examples - Role Based Views

Station overview Cockburn

Engineer Dashboard
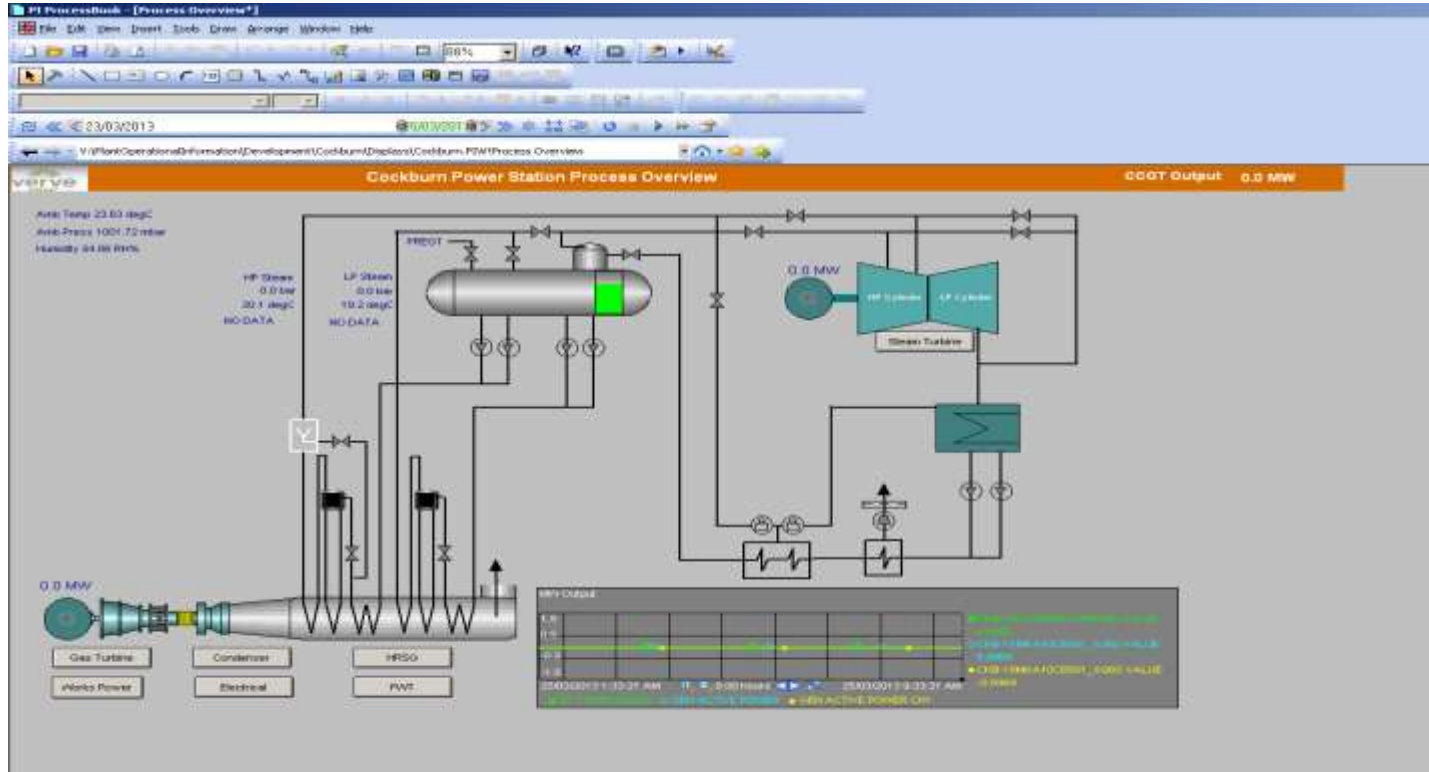
Examples - Role Based Views

Boiler tubes over nameplate temperature
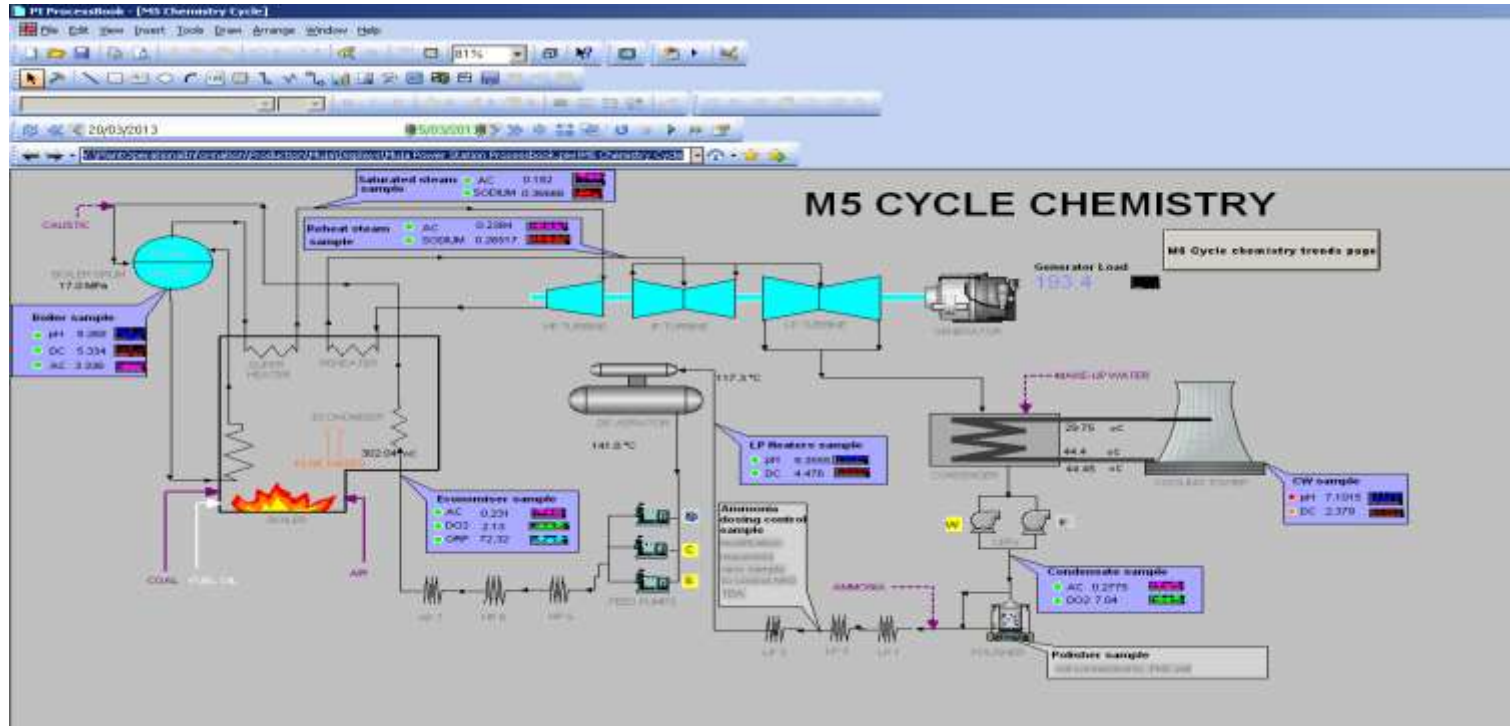
Boiler tube temperature excursions

Examples - Role Based Views

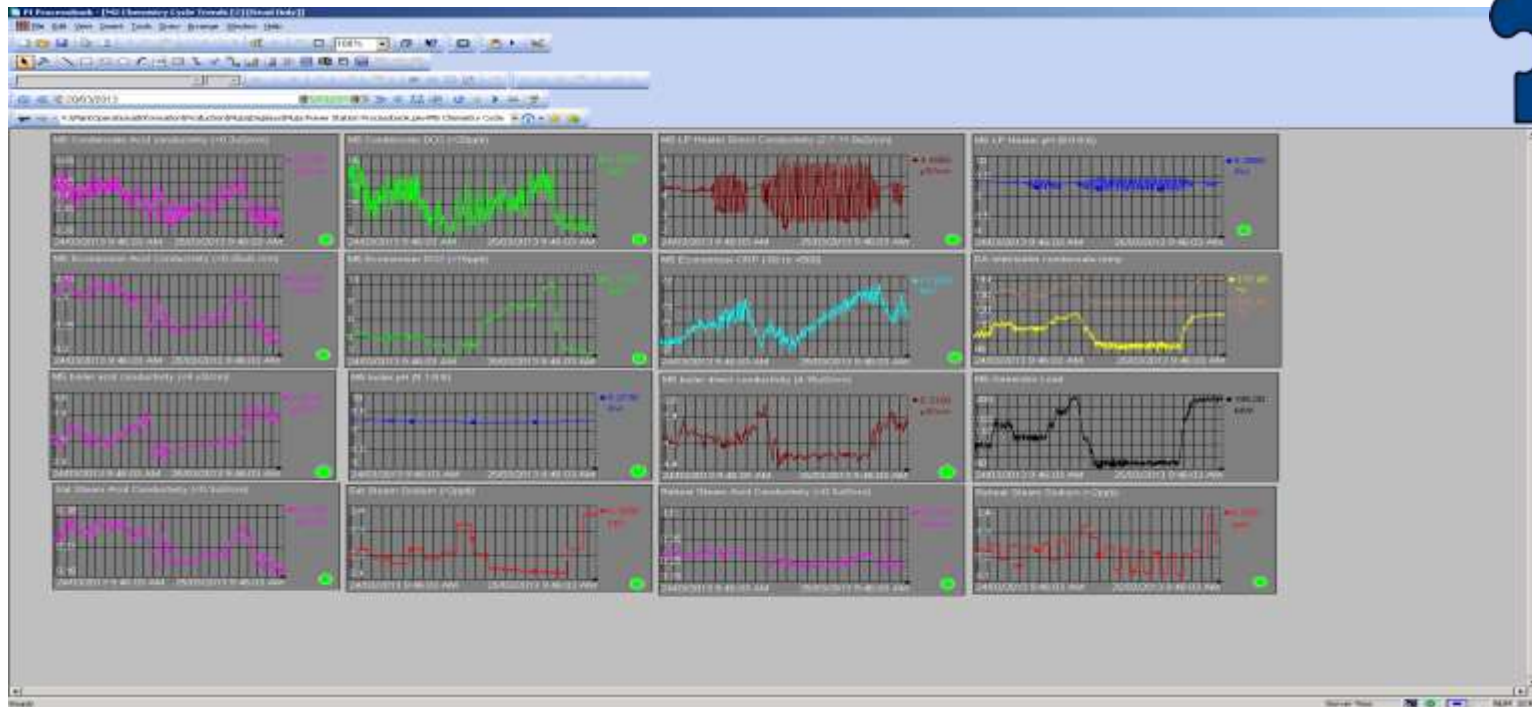Generating Unit Supervisory Display
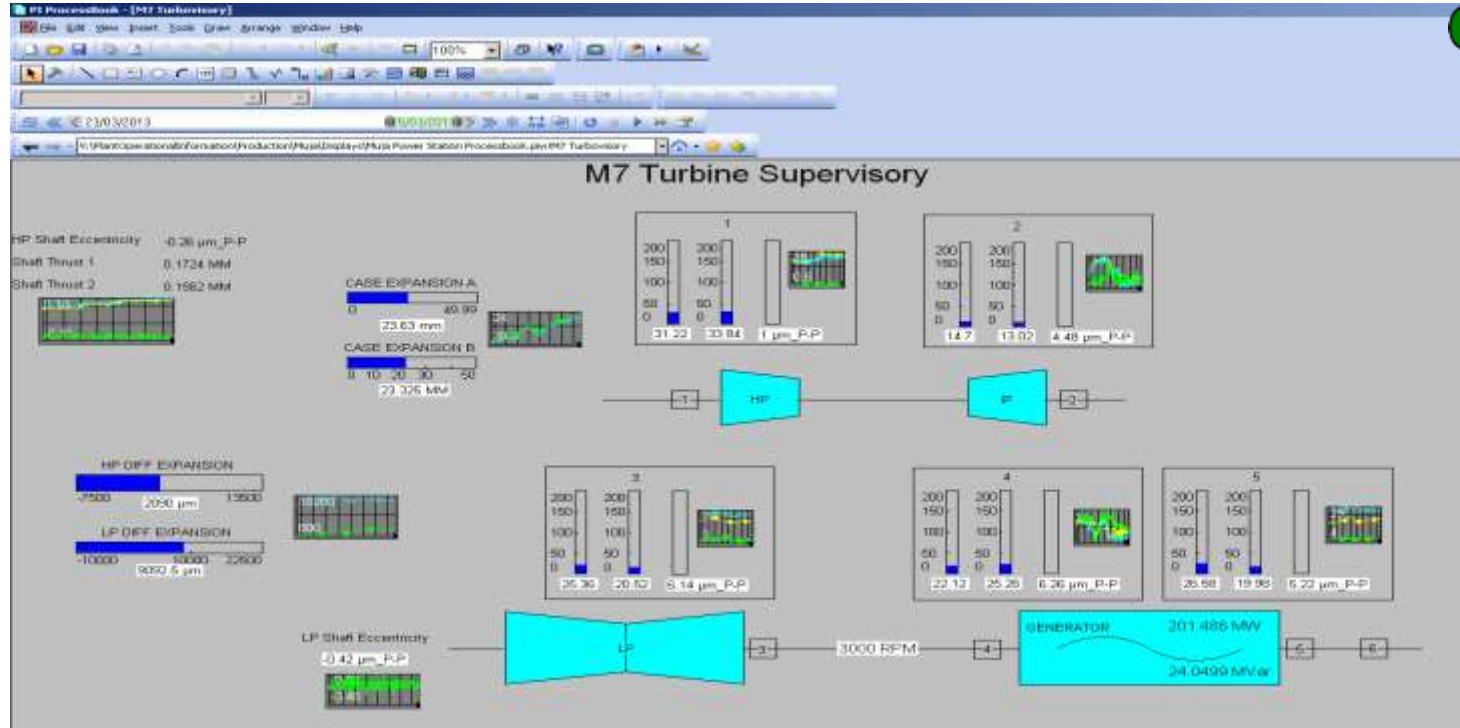
Examples - Role Based Views

Cycle Chemistry for Muja Unit 5

Examples - Role Based Views

Cycle Chemistry trends Muja Unit 5

Benefits – Bottom Line

‣ Substantial part of fuel savings target is underway in less than 12 months – and we are just scratching the surface

‣ We can see additional value within reach in predictive analysis to improve maintenance and other initiatives

‣ The intent is not to limit our scope of activities to just one or two projects

‣ We are having some C-level discussions about the need to support over 10+ initiatives in business improvement running in parallel

- In January we had 1 benefits realisation initiative that was well defined and economically sound

- In March we have 22!

Observations

Technology implementation – if adequate preparation is done – is not a major issue

Observations

Business transformation is the hard part

‣ The basis of data management has to be in place
  - Ownership of data
  - Change management in data feeds
  - Naming conventions, hierarchy structures
  - Establish a 'publish' process for reports, PI ProcessBook displays, web pages

‣ Training is key
  - Classroom training (baseline)
  - Advanced 'training' (value add)

‣ Allow for a learning curve
  - Allow experiments (and accept occasional rework); avoid "analysis – paralysis"
  - Facilitate exchange of ideas and solutions, both inside as with the external user community

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Observations

Formalise and facilitate benefits realisation

‣ Make it important

‣ Make it easy

‣ Make it visible

Questions & Feedback

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