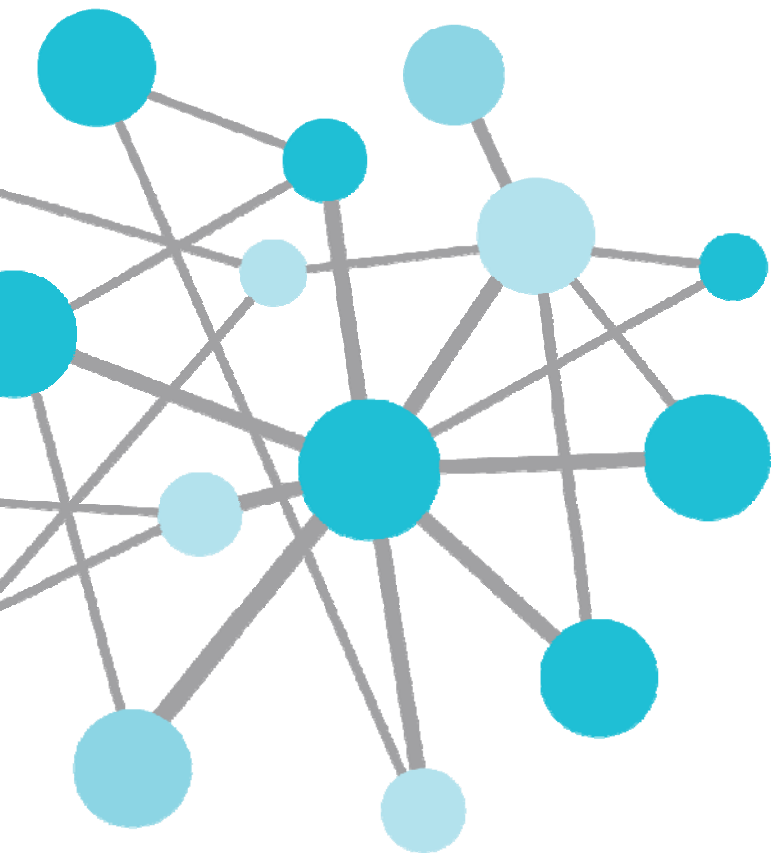




OSIsoft PI System: A Vessel for Change in Synergy

Presented by **Francois Mevis, Synergy**



OSIsoft PI System

A Vessel for Change in Synergy

Thursday, 18 September 2014

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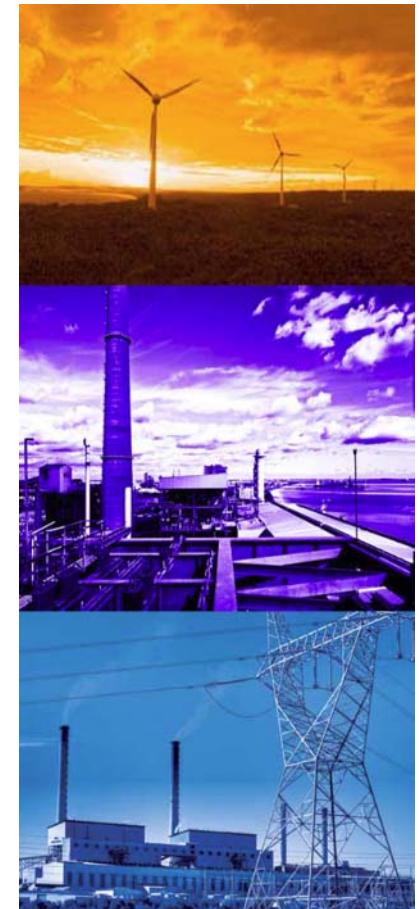
- Context
 - Company
 - Plant Operational Information Program
- Program set up
- Technology implementation
- Business transformation
 - Organising business transformation
 - Benefits realisation
- Observations
- Questions and feedback



About Synergy

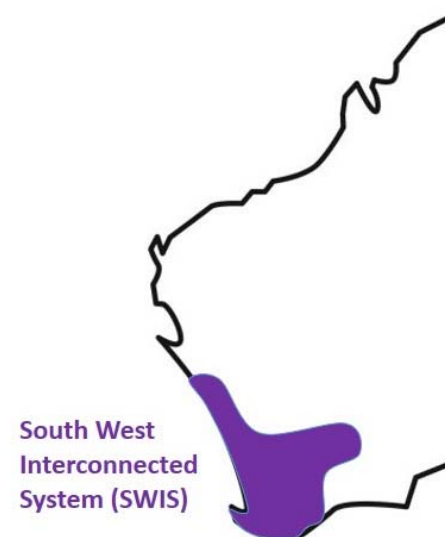
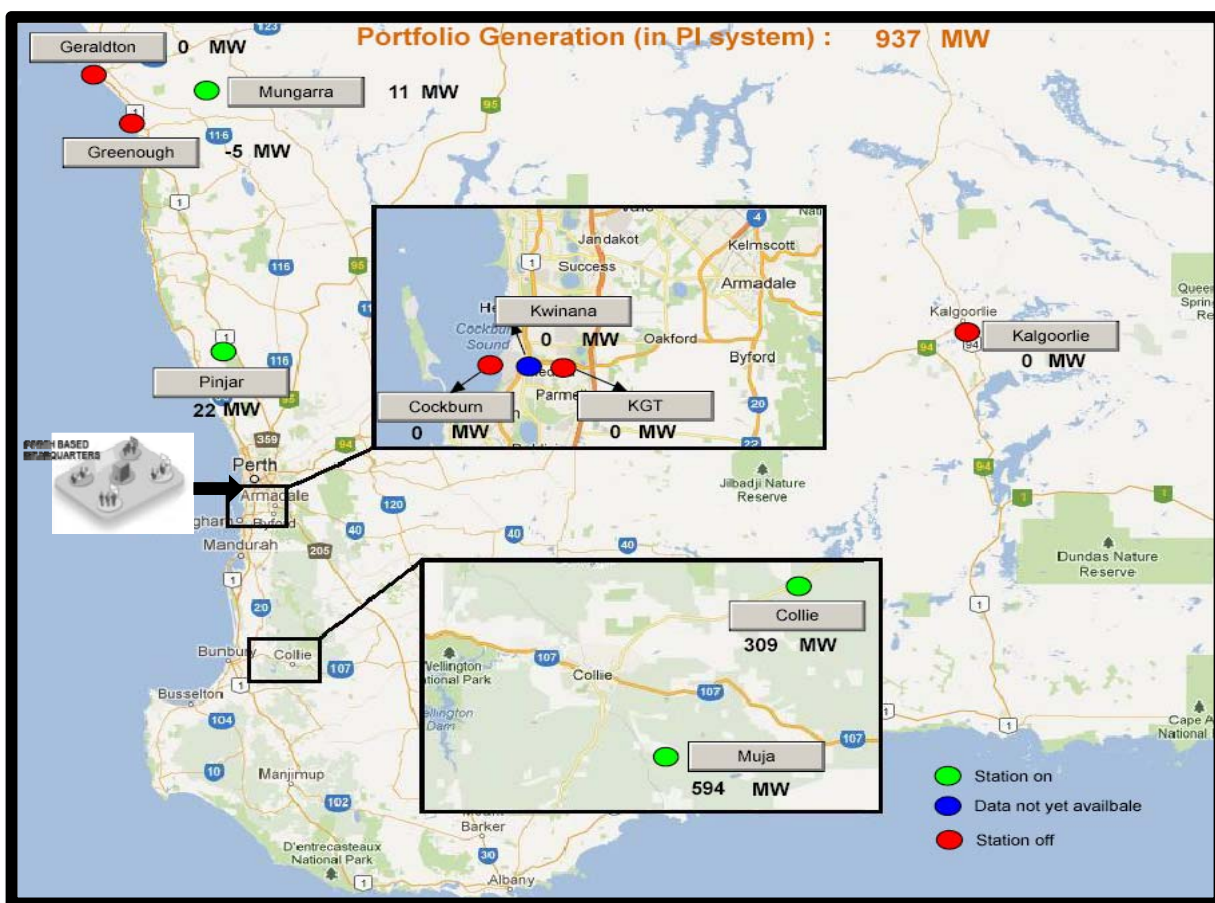
Synergy is Western Australia's largest electricity generator and retailer of gas and electricity

- Approximately 1300 staff
 - 5 major power station and 20 minor, unmanned sites
 - Over 1 million residential & commercial customers
 - The Generation BU is historically site and location focused
- Nameplate generation capacity is over 3000 MW
- Supply approximately 52% of energy in Western Australia, and about 55% of the contestable gas load in the commercial market
- Fuel is predominantly coal and gas, with smaller contributions from oil, wind and solar



Synergy Generation Portfolio

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



Context - Program

► 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



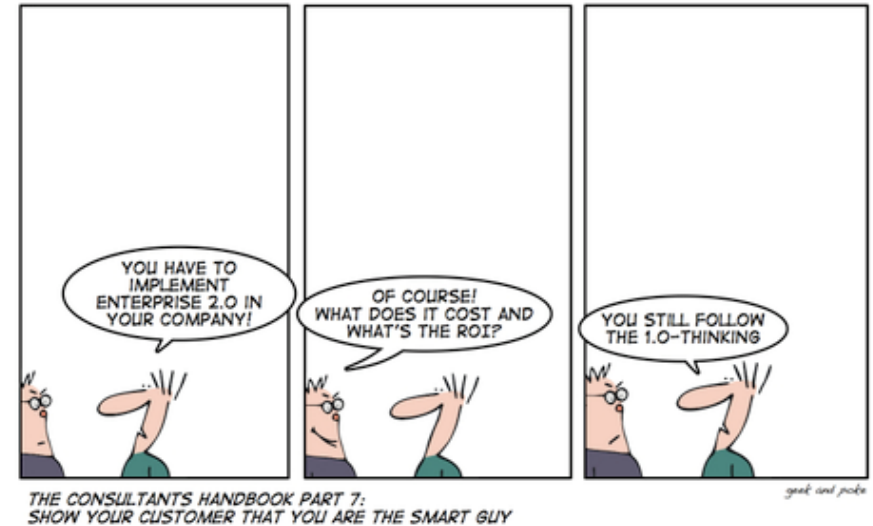
► What is the purpose?

- Increase visibility and usability of all operational data through standard toolsets
- “Stop smart people doing stupid work”

Business Case

Program 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 – 15 months later

▶ Business Case Justification

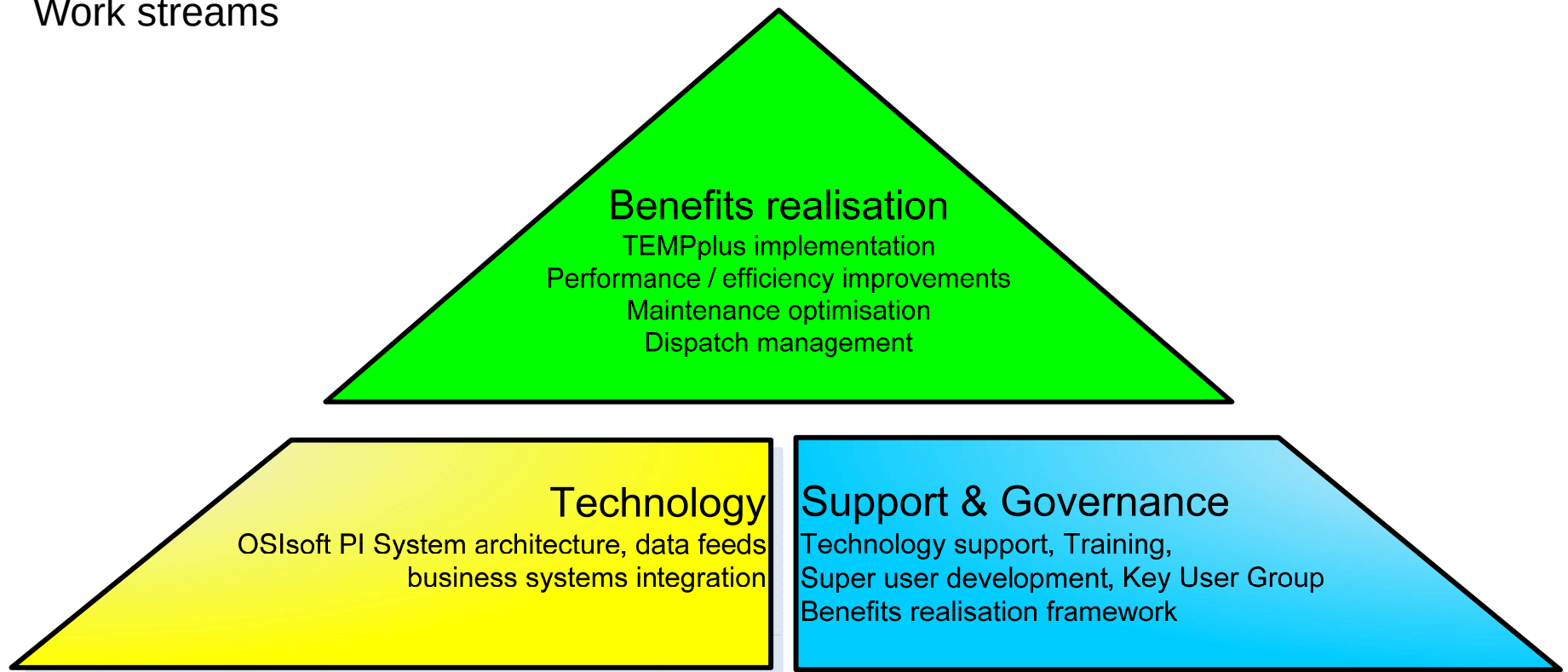
- Long term target is \$6.97M savings per year
 - increased efficiency
 - optimised maintenance
 - optimised availability – reduced capacity payments for forced outages

▶ Current state

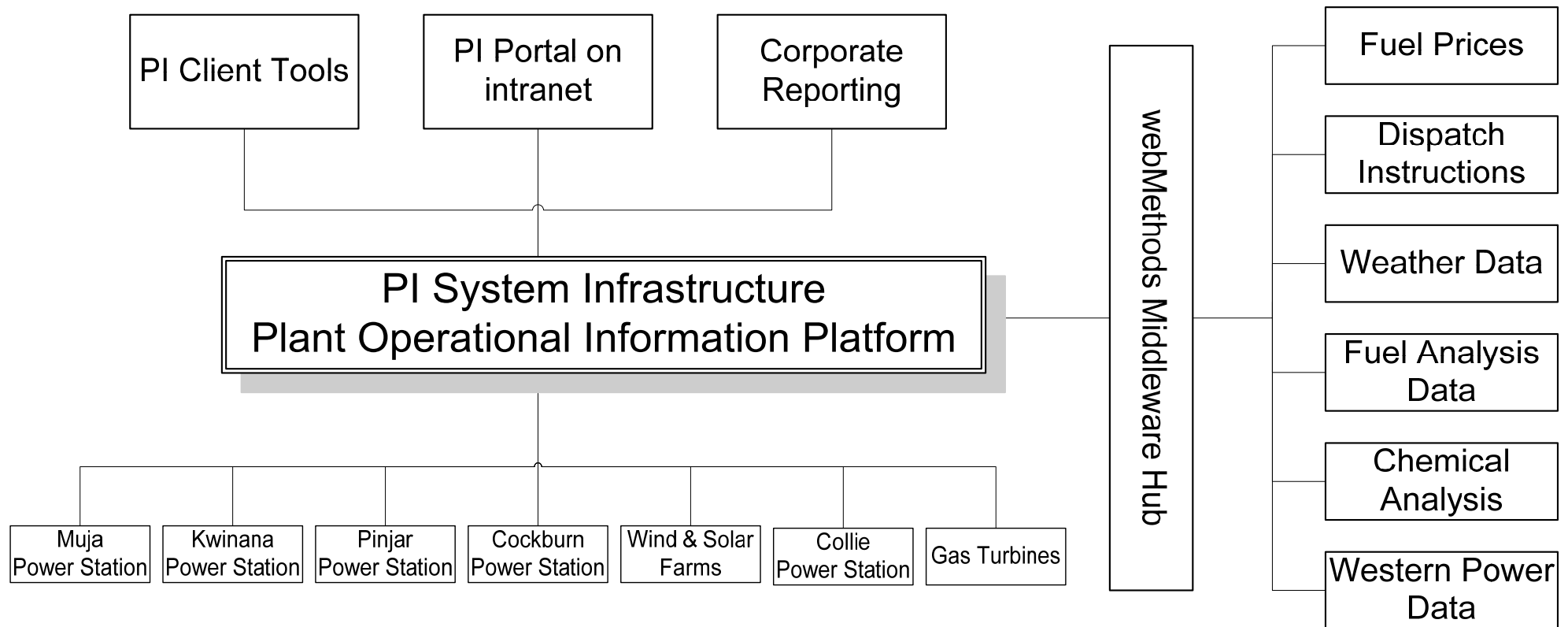
- We have 35 benefits realization initiatives identified, 12 completed
- Projected savings of \$2.5 million in initiatives

Program Structure

Work streams



Technology Implementation



Business Transformation

Organising Business Transformation

▶ Guiding principal:

“This is foremost a transformational program, not a technology implementation”

➤ **“All about the people”**

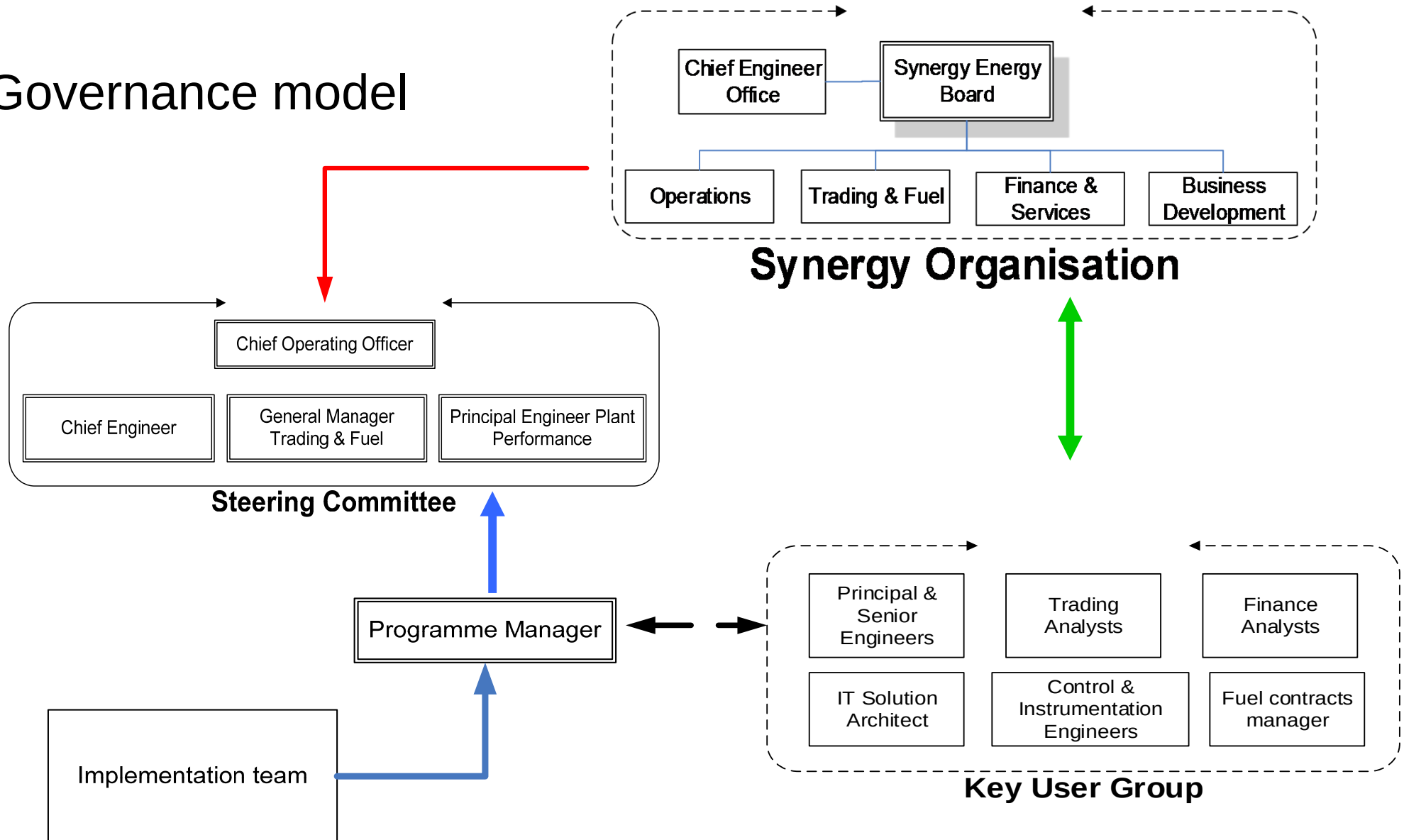
▶ Target both hierarchical and functional leaders

- General Managers
- Chief Engineer, Principal & Senior Engineers
- “Informal leaders”



Business Transformation

Governance model



Business Transformation

Organising Business Transformation

- ▶ Approach to functional leaders
 - Engaged at the start of the program
 - 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 program and the PI system



Business Transformation - KUG

Key User Group input

Microsoft Excel - VV_n3446720_v5_POIP_-_OSISOFT_PI_SUPPORT_RACI

	A	B	C	D	E
1	Operational State - Component/Activities	Server Support (ASG)	Database Support (ASG)	Application Support (IBN)	IT Service Management
2	Training - Advanced (ProcessBook / DataLink)				
3	Training - General (Web Based Tools)				
4	Training - System Administration				
5	Server OS	R		C	A
6	Network Hardware			C	A
7	Server Hardware	R		C	A
8	Desktop SOE			C	A
9	Database Administration		R	C	A
10	SharePoint Portal Administration			R	A
11	Create New Site Historian Tag & map to hierarchy				
12	Change Existing Site Historian Tag				
13	Delete Existing Site Historian Tag				
14	Create New Central Historian Tag				
15	Change Existing Central Historian Tag				
16	Delete Existing Central Historian Tag				
17	Ellipse - New Equipment				A
18	PI Asset Framework - New Equipment/System (includes tag mapping)				
19	PI Asset Framework - Change Equipment/System (incl tag mapping)				

PIAFPRD01\VerveProcessHierarchy - PI System Explorer

File Edit View Go Tools Help

Database Query Date Back Check In Refresh New Element New Attribute

Elements

- Verve Energy
 - Coal Fired
 - Collie
 - Unit 1
 - Air And Gas Systems
 - Auxiliary Air System
 - Flue Gas System
 - ID Fan
 - Precipitator
 - Primary Air System
 - PA Fan
 - Secondary Air System
 - Air Heater
 - FD Fan
 - Sec Air Damper
 - Kwinana
 - Muja
 - Corporate
 - Gas Turbines
 - Joint Ventures
 - Renewables

FD Fan

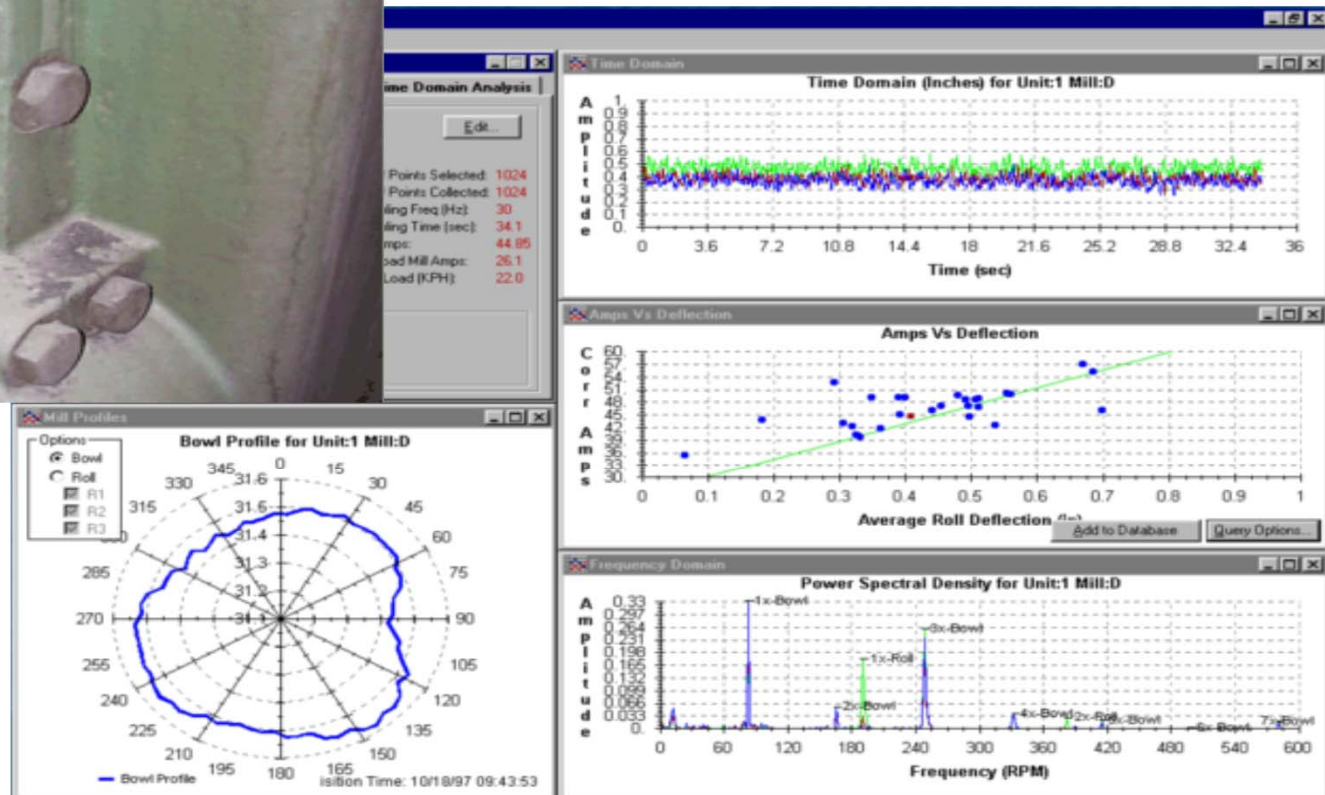
General Child Elements Attributes Ports Version

Filter

Name	Value
Air Flow To Windbox East	91.80052 kg/s
Air Flow To Windbox West	96.05302 kg/s
Air Heater Outlet Temp E	369.69 °C
Air Heater Outlet Temp W	368.82 °C
Air Htr Inlet Air Temp	34.63499 °C
Air Htr Outlet Air Press	1.0852 kPa
Air Temp To Windbox E	351.9178 °C
Air Temp To Windbox W	351.2079 °C
Ambient Air Temp FD Fan	31.62 °C
FD Fan Bearing Temp De	65.4975 °C
FD Fan Bearing Temp Nde	61.98 °C
FD Fan Motor Current	0
FD Fan Mtr Winding Temp	66.76498 °C
Furnace Pressure Median	-0.2000008 kPa
Steam Air Htr Inlet Air	1.729999 kPa
Steam Air Htr Outlet Air	1.890799 kPa

Business Transformation - KUG

Key User Group input



Business Transformation - Benefits

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
- 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



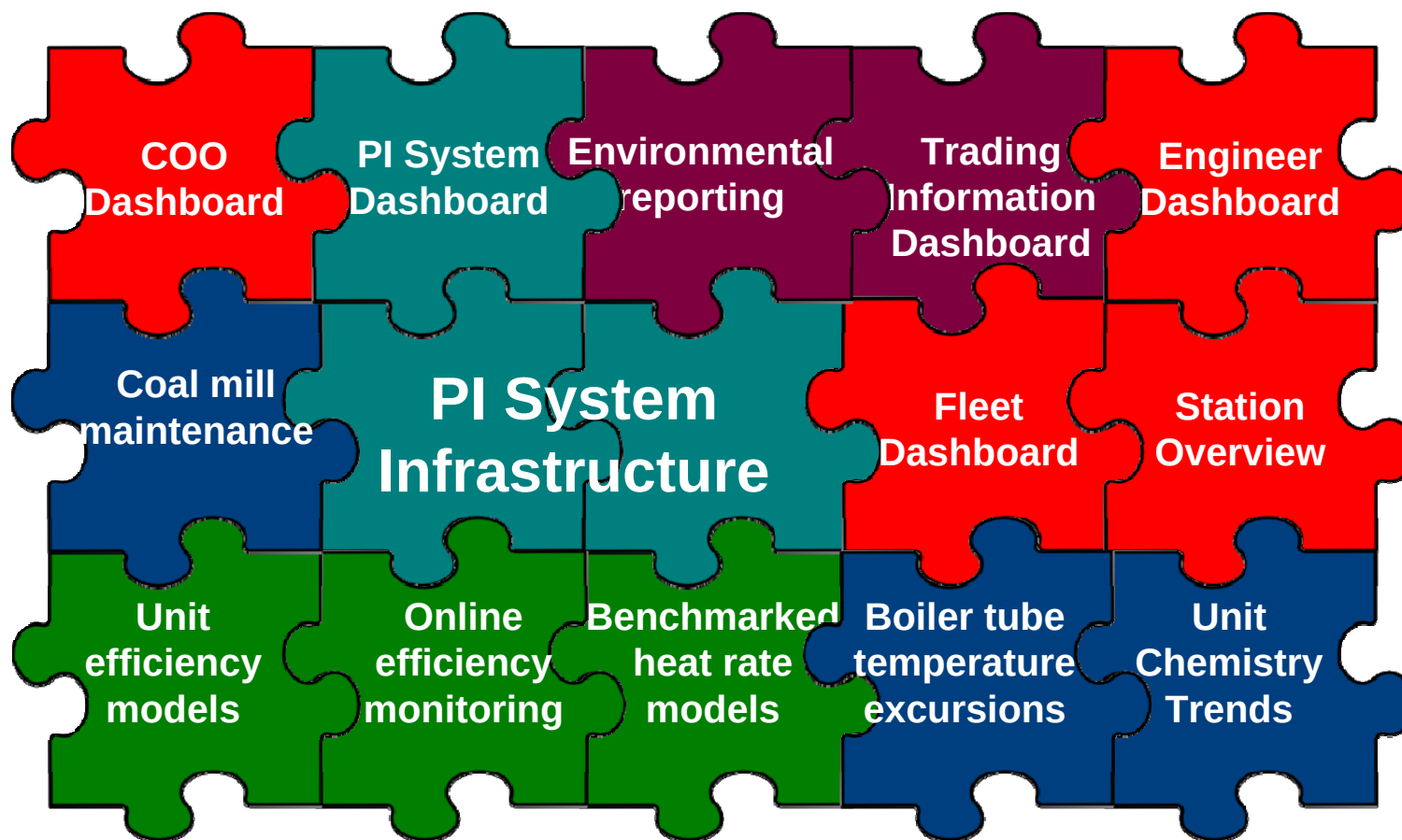
Recently we have split the KUG in a **Service Delivery Team** and an **Innovation Forum**

- Increase focus on and momentum of benefits realisation
- **Service Delivery Team:** run & maintain, data management, security management
- **Innovation Forum:** Benefits Realisation Initiatives, Product demonstrations, Proof of Concepts

Business Transformation - Benefits

- Define responsibility and create interest
 - Realisation of benefits is embedded in KPI's
 - Benefits have 'owners'; the program structure enables and monitors progress
- Enable and support – 'make it easy'
 - Periodic user training
 - Functional support staff ('super users') are located on all sites, invested in hiring SME's
 - Existing contractual arrangements with consultancy companies that specialise in the PI System
 - Quick Reference Guide, how-to videos and user guides
- Create a process for identifying, starting and tracking of initiatives
 - All initiatives are tracked against a benefits realisation dashboard
 - Program funds approved initiatives

Business Transformation - Benefits



Capability Development

PI System Infrastructure & data feeds
Integration with Intranet, create awareness

Explore expert systems:

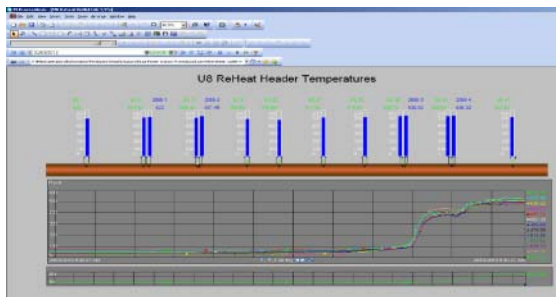
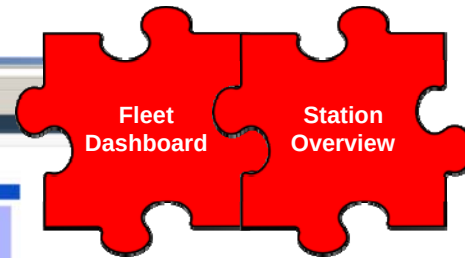
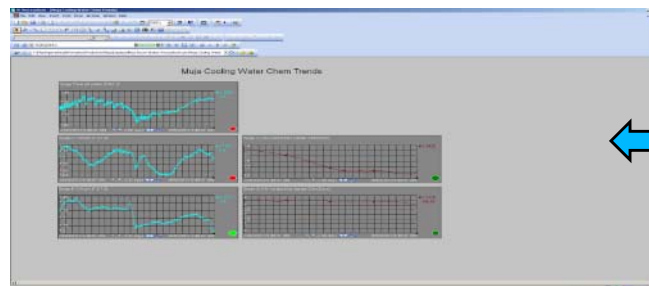
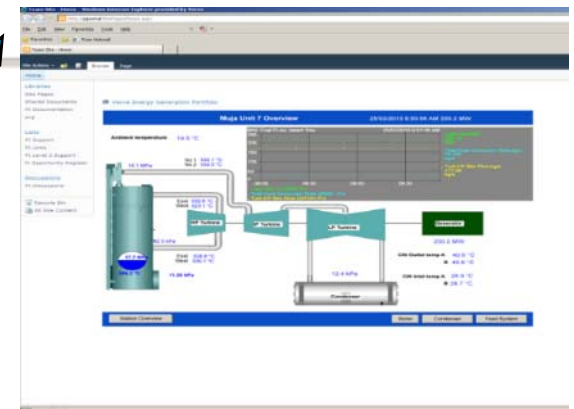
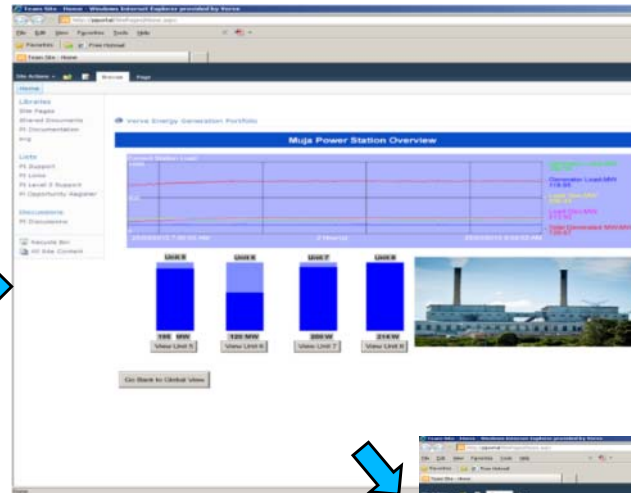
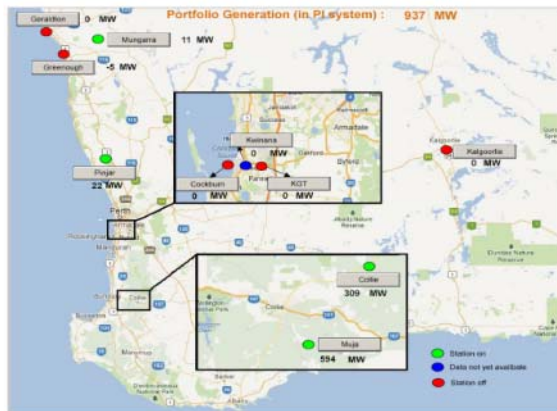
- Performance Optimisation
- Asset use optimisation, predictive monitoring

Relate other data sources:

- Advanced analysis & process tuning

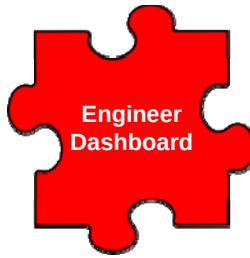
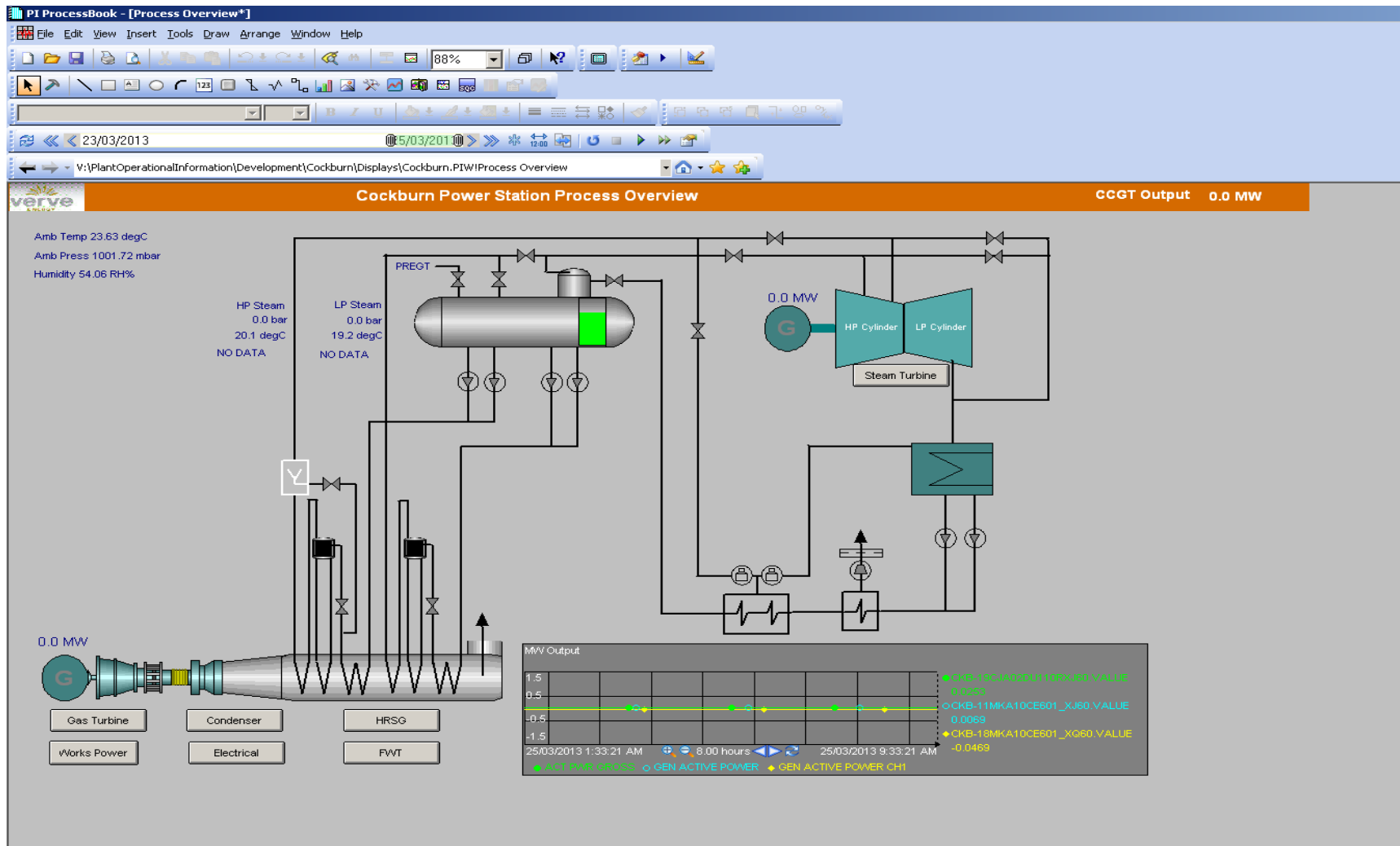
Examples – General Dashboard

Map overview > Site > Unit > Detail



Examples - Role Based Views

Station overview Cockburn



Examples - Role Based Views

Boiler tubes over nameplate temperature

Microsoft Excel - U7 Final Stage RH HDR Temps

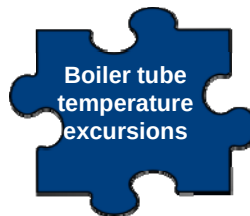
File Edit View Insert Format Tools Data Window PI Help Adobe PDF

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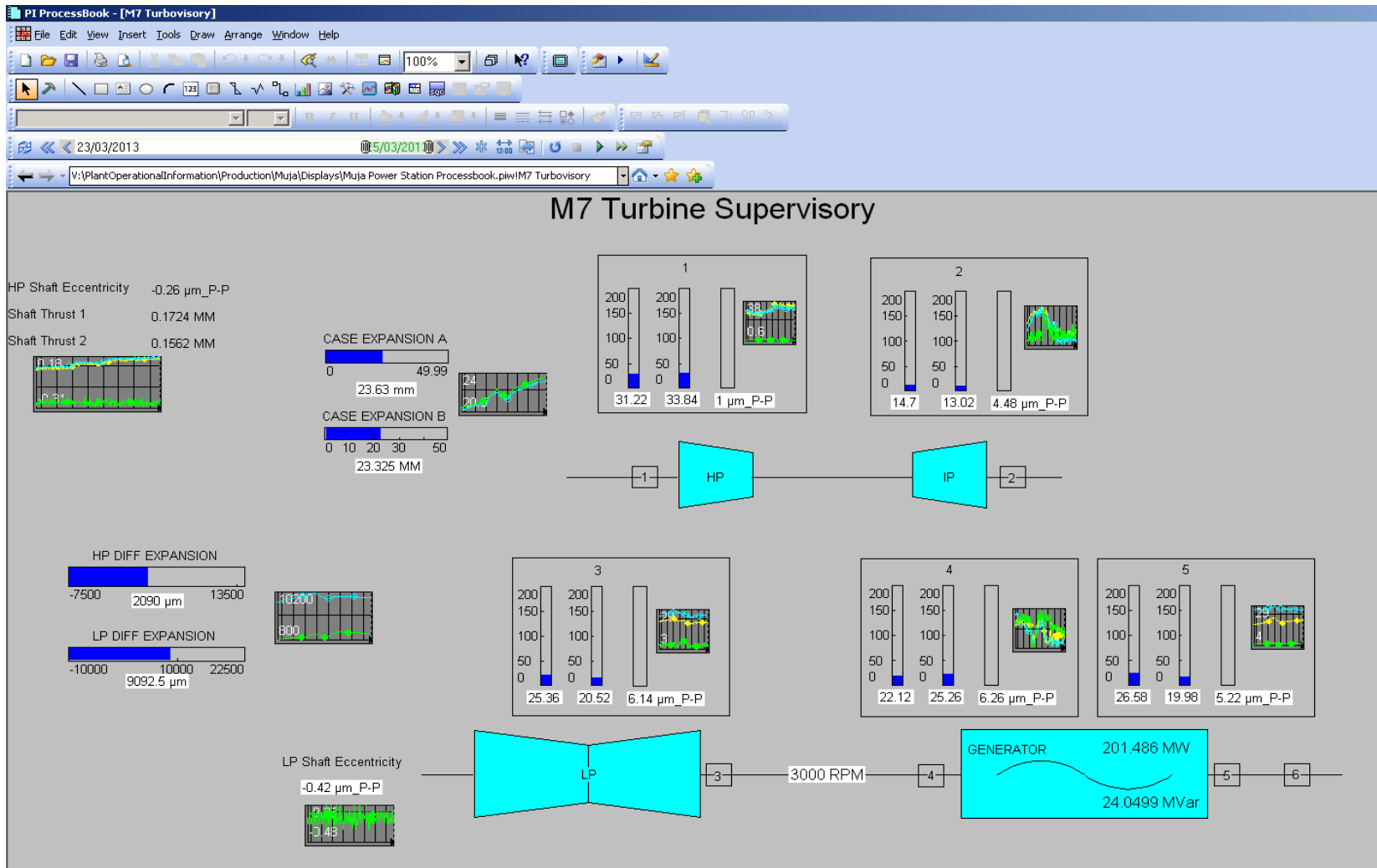
F22 fx

	A	C	D	E	F	G
1		U7 Final Stage R/H Header Temperatures				
2	Start Time					
3	1/05/2012					
4	End Time					
5	30/06/2012					
6						
7	Stub T/C's	Maximum Date/Time	Maximum Value	Minutes > 560degC		
8	MPS-7-RHS-TE-2055-1-XQ01	21-May-12 12:14:07	581.94	42.60		
9	MPS-7-RHS-TE-2055-2-XQ01	19-May-12 05:09:55	581.88	849.57		
10	MPS-7-RHS-TE-2055-3-XQ01	11-Jun-12 08:23:11	584.70	1045.75		
11	MPS-7-RHS-TE-2055-4-XQ01	[-11059] No Good Data F	[-11059] No Good Da	0.00		
12	Header T/C's					
13	MPS-7-RHS-TE-3103-1-XQ01	07-Jun-12 07:24:20	543.96	0.00		
14	MPS-7-RHS-TE-3103-11-XQ01	07-Jun-12 07:24:23	576.42	26.10		
15	MPS-7-RHS-TE-3103-17-XQ01	07-Jun-12 07:22:39	574.20	31.67		
16	MPS-7-RHS-TE-3103-22-XQ01	19-May-12 05:10:06	563.64	27.33		
17	MPS-7-RHS-TE-3103-27-XQ01	19-May-12 05:10:23	574.50	89.72		
18	MPS-7-RHS-TE-3103-32-XQ01	07-Jun-12 07:24:09	577.38	60.40		
19	MPS-7-RHS-TE-3103-38-XQ01	07-Jun-12 07:21:55	577.80	27.97		
20	MPS-7-RHS-TE-3103-42-XQ01	10-Jun-12 11:05:41	552.60	0.00		
21	MPS-7-RHS-TE-3103-47-XQ01	03-May-12 03:44:29	491.94	0.00		
22	MPS-7-RHS-TE-3103-6-XQ01	07-Jun-12 07:24:41	580.68	58.78		
23						
24						
25						
26						



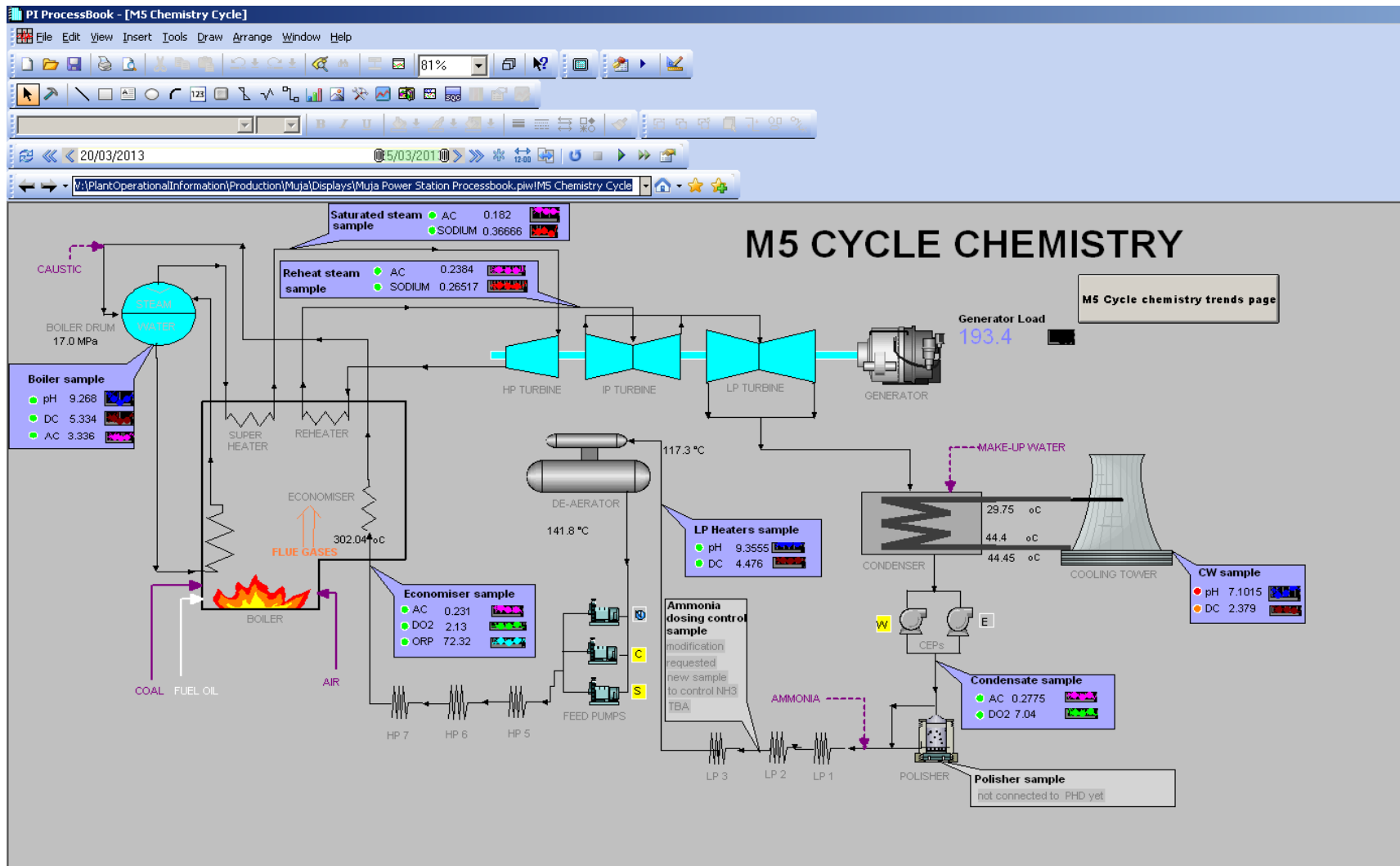
Examples - Role Based Views

Generating Unit Supervisory Display



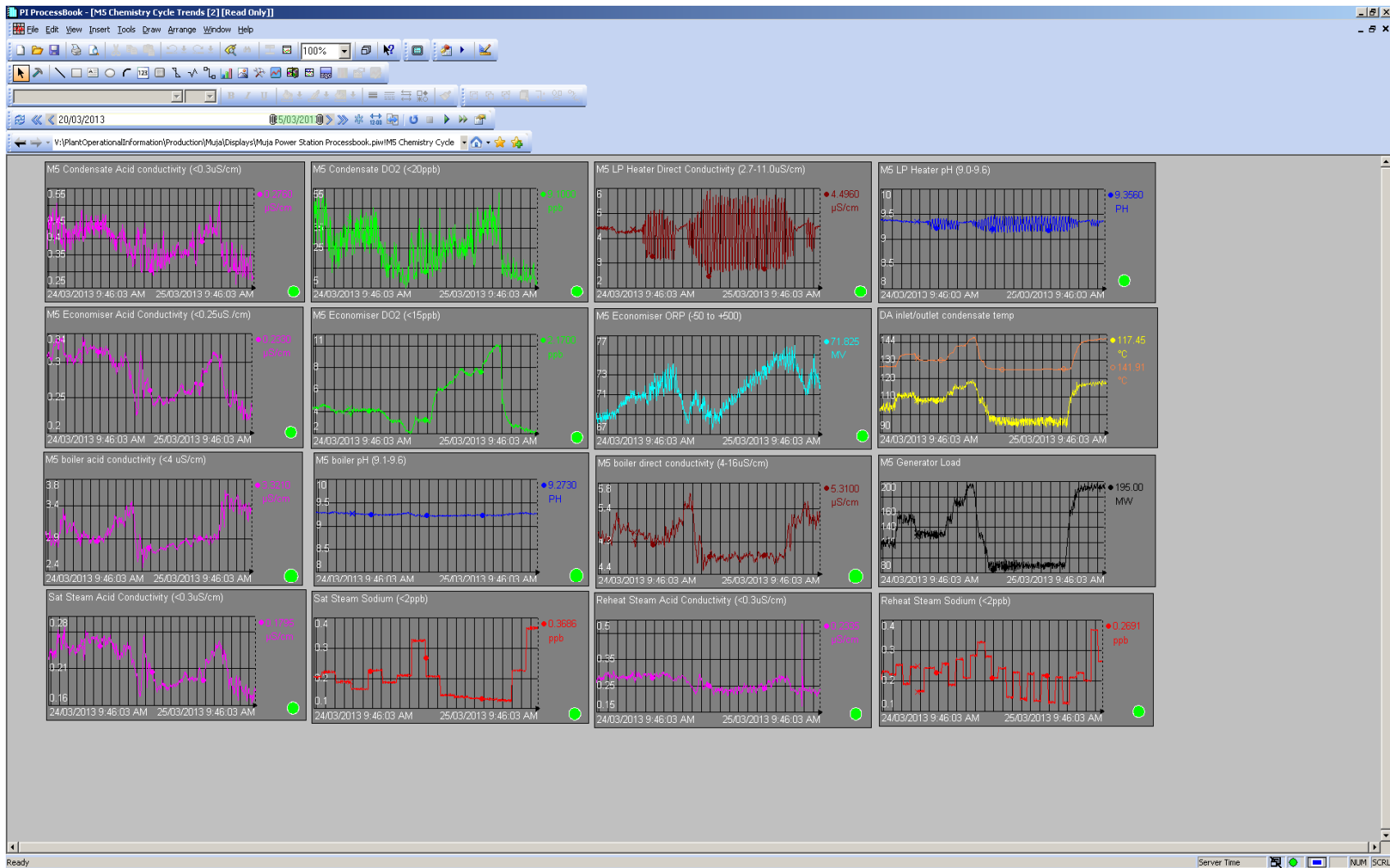
Examples - Role Based Views

Cycle Chemistry for Muja Unit 5



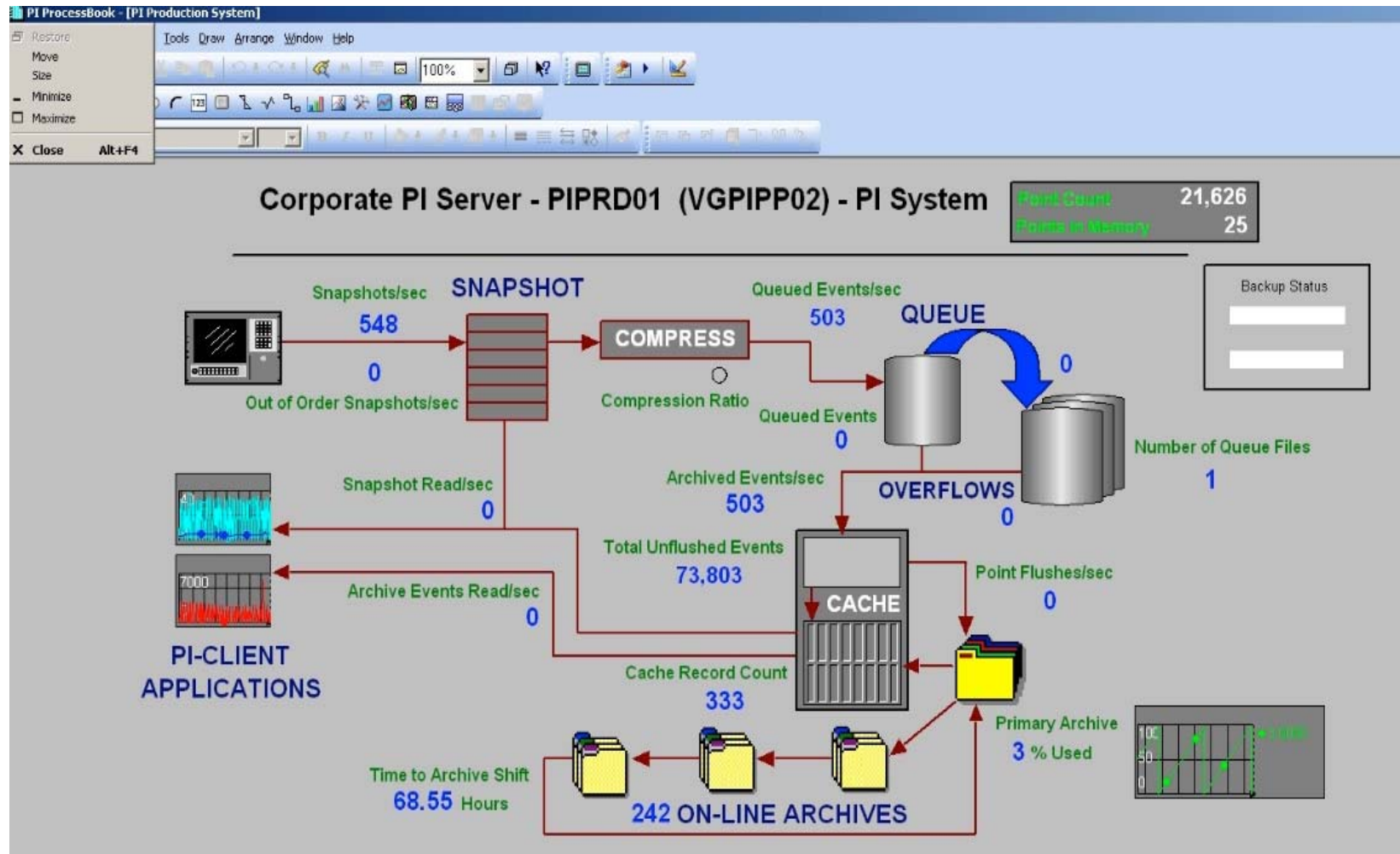
Examples - Role Based Views

Cycle Chemistry trends Muja Unit 5



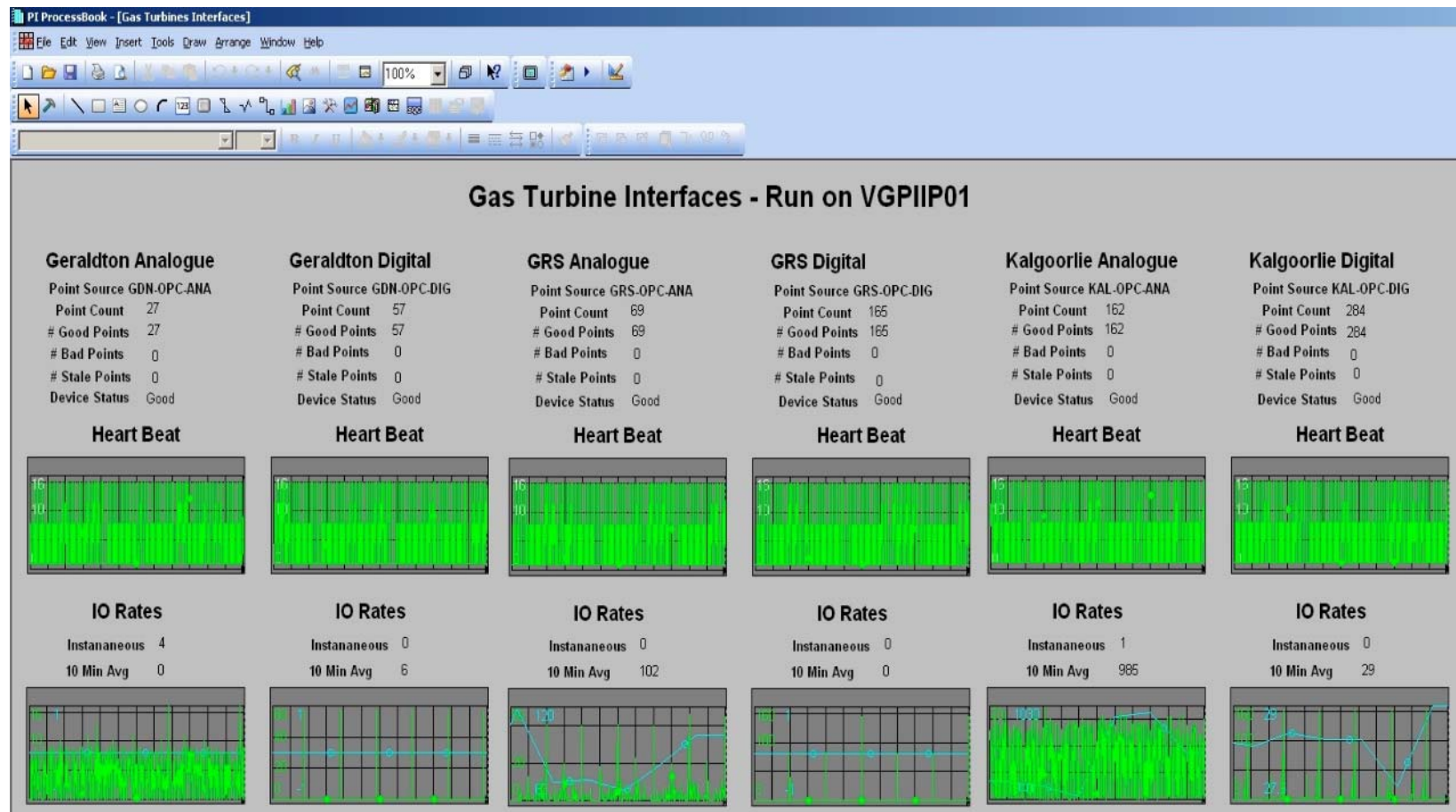
Examples - Role Based Views

Data flow overview



Examples - Role Based Views

Interface status



Benefits – Bottom Line

- ▶ Substantial part of projected savings target is underway in less than 12 months – and we are just scratching the surface
- ▶ The intent is not to limit our scope of activities to just one or two projects
- ▶ What's next:
 - ▶ Integration with Asset Management system and data
 - ▶ Advanced data analytics – predictive analytics
 - ▶ Event driven visualisation – “what you need to know right now”

Observations

Technology implementation is not a major issue

- Adequate design and preparation
- Focus on standardisation and robustness
- Real-time visibility of data feeds and system parameters is important
 - Be prepared for 'dirty data'

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

Observations

Formalise and facilitate benefits realisation

- ▶ Make it important
- ▶ Make it easy
- ▶ Make it visible

Questions & Feedback



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Manager ICT Generation

Synergy



THANK YOU

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