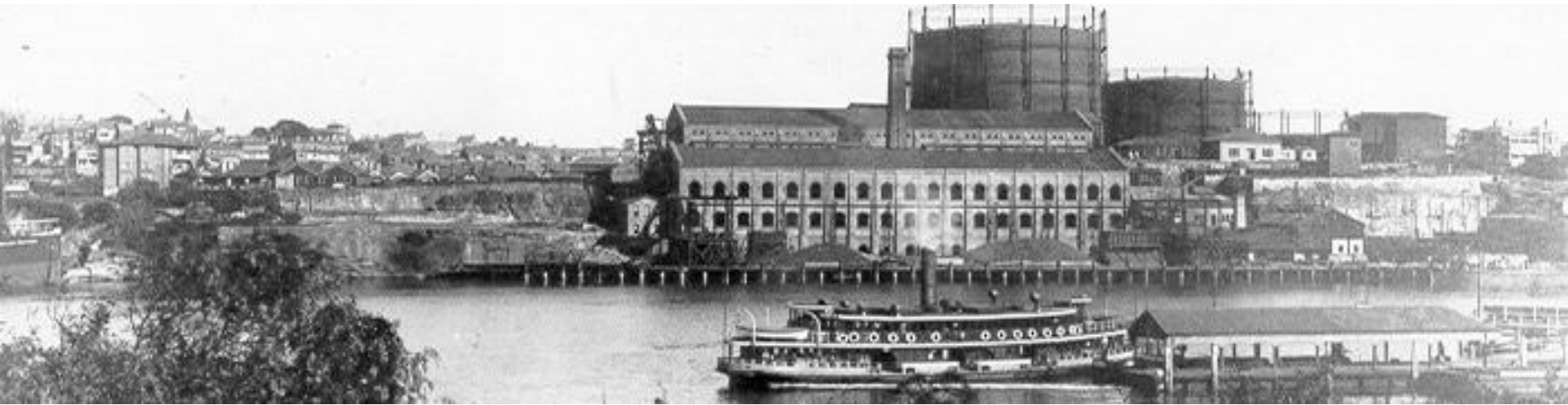




The AGL data journey supported by the OSIsoft EA

Presented by **David Bartolo**

AGL 177 years of energy supply



- Drawing on more than 177 years of experience, we operate retail and merchant energy businesses, power generation assets and an upstream gas portfolio.
- Our Retail Energy Division sells and markets natural gas, electricity and energy related products and services to more than 3.8 million residential and small business customer accounts across New South Wales, Victoria, South Australia and Queensland.



AGL 177 years of energy supply

Early suppliers of gas lighting infrastructure and services

- Since creation in 1837, we are proudly one of Australia's oldest companies
 - 1837. The Australian Gas Light Company was created with 'An Act for Lighting with Gas the Town of Sydney'.
 - 1841. The Australian Gas Light Company lit the first gas lamp in Australia. Within two years there were 165 gas lamps in the city of Sydney.



AGL 177 years of energy supply

The move to electricity

- AGL early history concentrated mainly on supplying gas and related services to customers via investor owned infrastructure
- In the mid 1990's with the set up of the Australian National Electricity Market (NEM) and privatization of retail electricity markets in NSW and Victoria AGL move strongly into this market.
- By 2005 AGL is structured such that it owns and operates two types of businesses:
 - Heavily regulated Gas and Electricity distribution assets
 - Lightly regulated Electricity and Gas retail and upstream supply assets



AGL 177 years of energy supply

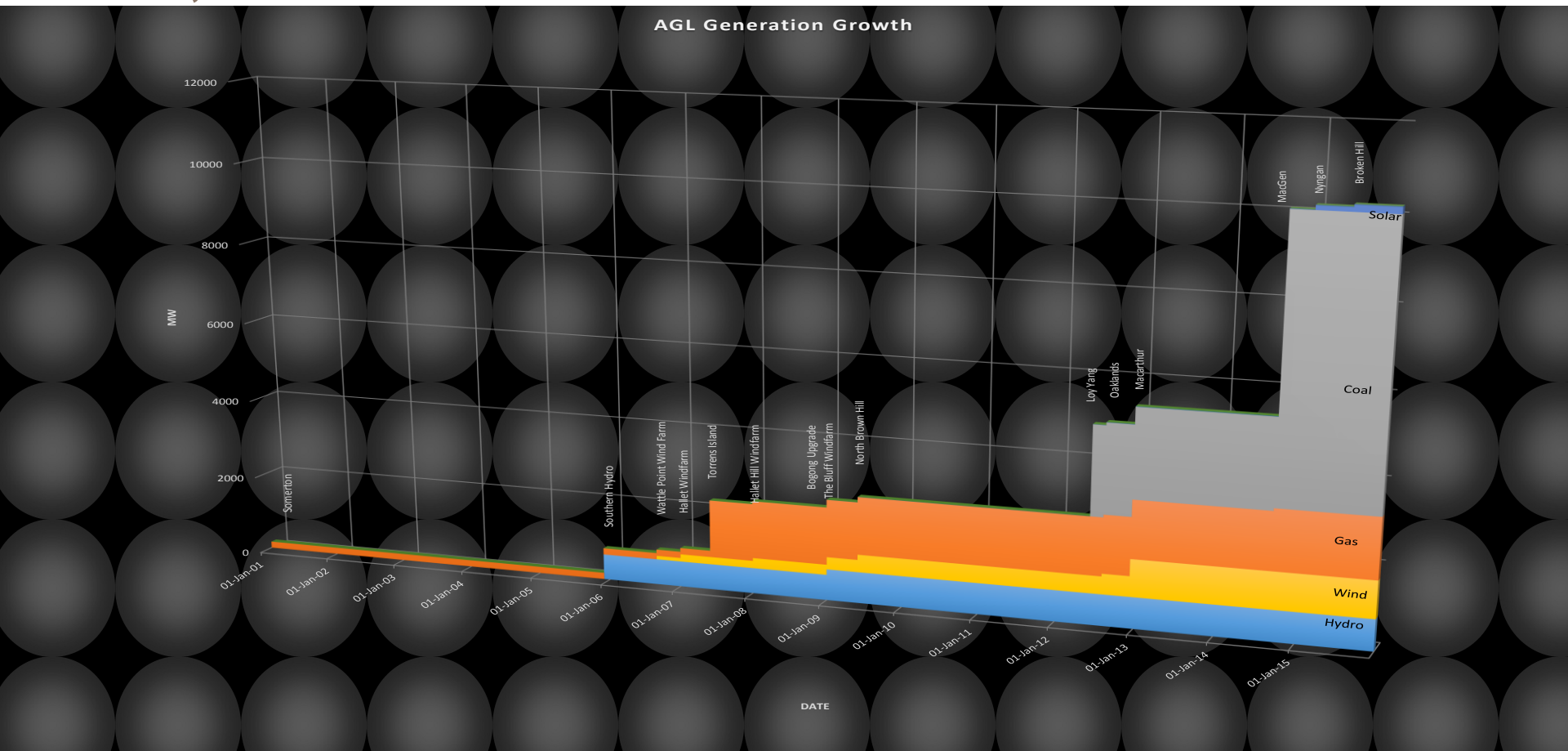
2006 a new strategy is born

In 2006 AGL restructures its business announcing its “Vertically Integrated Energy Strategy” that focused on supplying customers via the National Electricity and Gas markets, ensuring market position was supported by AGL owned and controlled upstream supply assets (including power generation and gas production/ storage assets). As such regulated distribution assets were sold, raising much needed capital to help fund the purchase of assets that would directly support the new strategy.



Growth of the MO Generation Fleet

300-10,000MW in 9 Years



AGL Merchant Operations Generation Fleet

2015

- Merchant Operations is responsible for the physical operation and maintenance of AGL's growing portfolio of wind, hydro, gas fired, coal fired and solar generation plants.

HYDRO	MW	Units	Stations
NSW Stations	49	6	5
Dartmouth / Banimboola	192	4	2
Kiewa Scheme	391	14	4
Eildon / Rubicon	133	10	5
Yarrowonga	10	2	1
Cair Curran	2	1	1
Total	777	37	16

WIND	MW	Units	Stations
Hallet WF (1) SA	95	45	1
Hallet Hill WF (2) SA	71	34	1
N Brown Hill WF (4) SA	132	63	1
The Bluff WF (5) SA	53	25	1
Wattle point WF SA	91	55	1
Macarthur WF, VIC	420	140	1
Oaklands WF VIC	67	32	1
Total	929	394	7

STEAM TURBINE	MW	Units	Stations
Torrens Island (SA, Gas fired)	1,280	8	2
Loy Yang Power Station (Vic, Brown Coal)	2,210	4	1
Liddel (NSW, Black Coal)	2,640	4	1
Bayswater (NSW, Black Coal)	2,000	4	1
Total	8,130	20	5

SOLAR	MW	Units	Stations
Nyngan	102	1	1
Broken Hill	53	1	1
Total	155	2	2

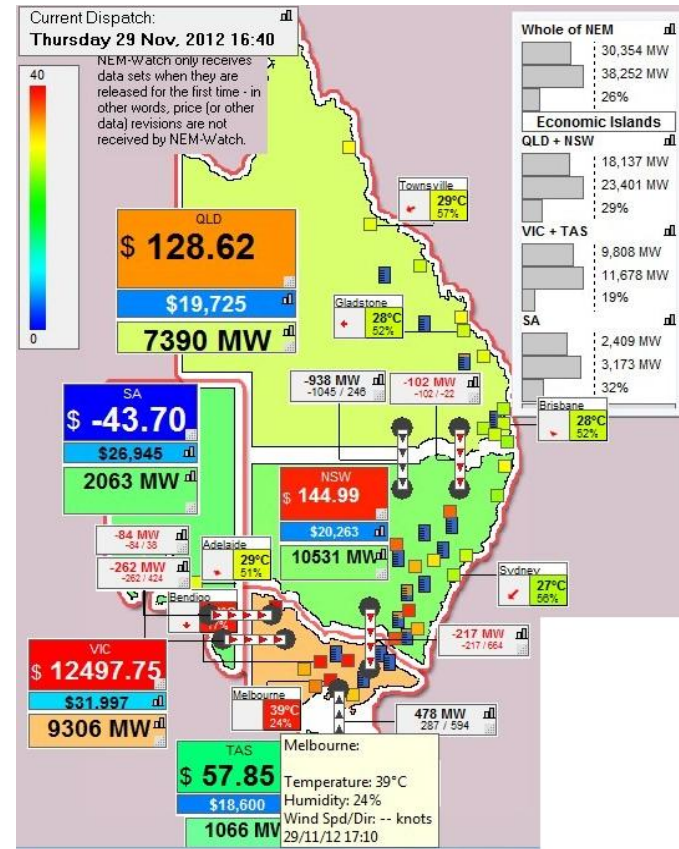
OPEN CYCLE GAS TURBINE (GAS FIRED)	MW	Units	Stations
Somerton (VIC)	170	4	1

	MW	Units	Stations
Fleet Total (operational)	10,161	457	31

Australian National Electricity Market

2006 a new strategy is born

- The NEM interconnects five regional market jurisdictions (Queensland, New South Wales, Victoria, South Australia and Tasmania).
- The transport of electricity from generators to consumers is facilitated through a 'pool', or spot market, where the output from all generators is aggregated and scheduled at five minute intervals to meet demand.
- Supports 19 million residents.
- At over 5,000 km from far north Queensland to Tasmania, and west to Adelaide and Port Augusta, is the longest alternating current system in the world.
- Has about 40,000 km of transmission lines and cables.
- Supplies about 200 TWh of energy to businesses and households each year.
- Is long and linear compared with Europe and North America.



Merchant Operations Early 2012

- Generation Fleet at approximately 2500MW
- Loy Yang Power Station (2200MW) purchase looking probable
- Centralised Asset Management Team established and PAS55 standard for Asset Management being used affectively to improve MO business performance, concentrating mainly in the areas of strategic planning and risk based investment
- BUT, Real time data systems are disparate and problematic

Data Landscape MO Early 2012

- Data issues facing AGL MO
 - Limited deployment
 - Live “Read Only” SCADA screens being used for real time visualization
 - Data skill set not transferable
 - High reliance on human data champions at each site to provide data
 - Data precision and tractability poor
 - Many data collection processes still manual
 - Data “black spots” reducing capability to investigate asset performance and incidents effectively
 - Centralised human resources hampered by poor access to asset data
 - No capability to efficiently execute any type of Data Analytics across the portfolio

AGL MO was projected to grow to 9000+ MW within 4 years! A data solution that matched our growth strategy was urgently required.....

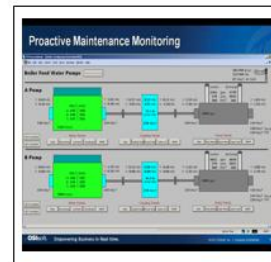
OSIsoft's PI System chosen as the AGL MO real time data solution



Single Real Time Data Historian

Advanced Visualisation Tools

Advanced Analytics Capability and Tools



High performance from standard infrastructure

Capability to connect to all AGL DCS/PLC/SCADA



Partner products can accelerate the road to value for AGL

Improved data search efficiency

Proven Generation Assets History

Transferable human resource data skill set



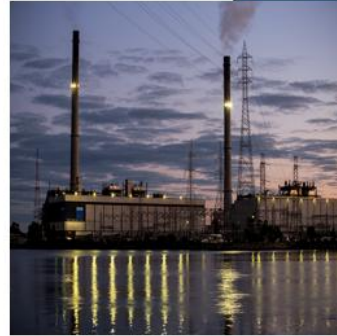
One source of truth



OSIsoft PI System: What type of partnership?



Standard
Maintenance
or
Enterprise
Agreement ?



OSIsoft Enterprise Agreement (EA)

Reducing Risk to AGL

Architecture

- EA Technical Support
- EA Rollout Plan
- System performance monitored

Data Culture

- Training Services
- Unlimited user Licences

Scalability

- Flexible EA
- Easy to include new assets

Value Realisation

- EA assists value realisation program



OSIsoft EA at work for AGL from day 1

Value Realisation Program

- › Value realisation program started early with OSIsoft assisting stakeholders to understand capabilities and pursue value

Rollout Plan

- › AGL and OSIsoft's technical resources work as one team to plan and effect product deployment

Training Program

- › EA includes a significant training program that has greatly assisted AGL achieve strong uptake of the new capability

Partner Solutions

- › EA used to assist AGL to adopt OSIsoft's partner solutions quickly and efficiently (RtDuet, Predict It)

Installation

- › EA Tech support used extensively during installation phase
- › EA Tech support services able to quickly respond to unforeseeable issues during complex install
- › EA assists AGL to pursue two phase deployment due to budget constraints (Central instance delayed)

Roadmap

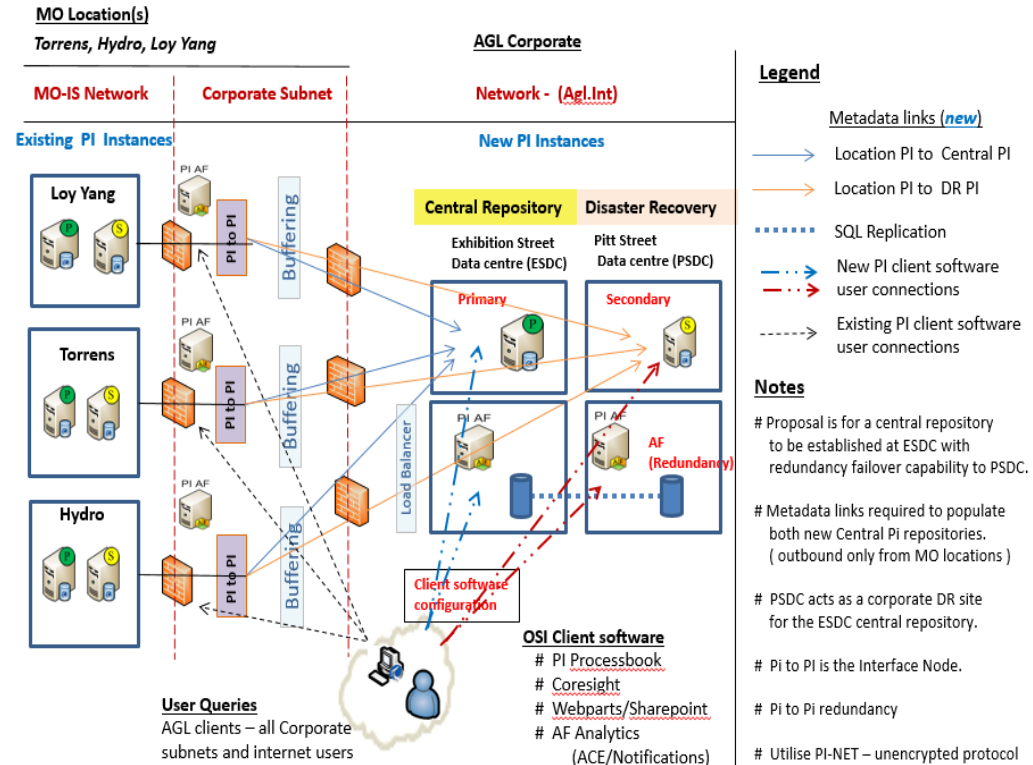
- › OSIsoft assists AGL to build an appropriate product road map to ensure the product matures such that value realisation is continual

OSIsoft PI System: AGL Merchant Operations 2015

- Over 200,000 tags and 1000 key pieces of equipment.
- Building AFs for easy navigation
- Established Corp-PI System instance
- Creating one true secure source of information available to everyone.

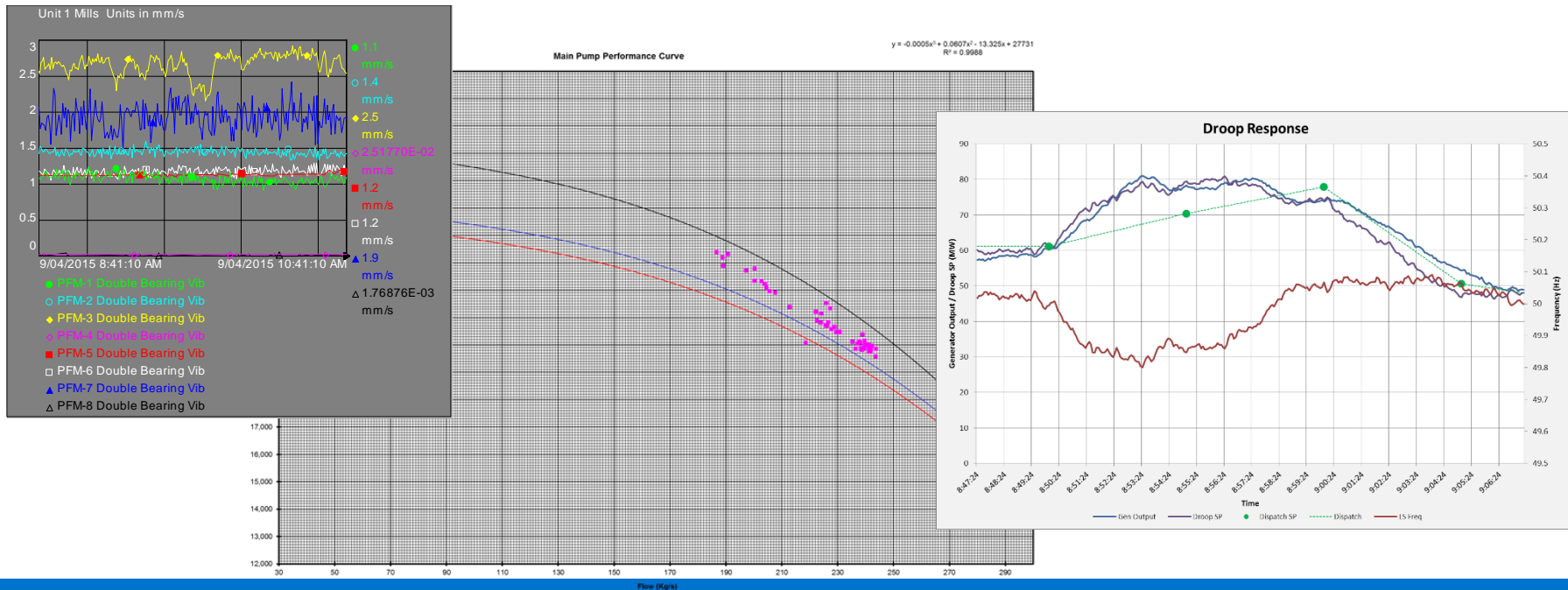
Central PI Instance – Concept Overview

Date: May 2014



OSIsoft PI System Early Value: A new data culture

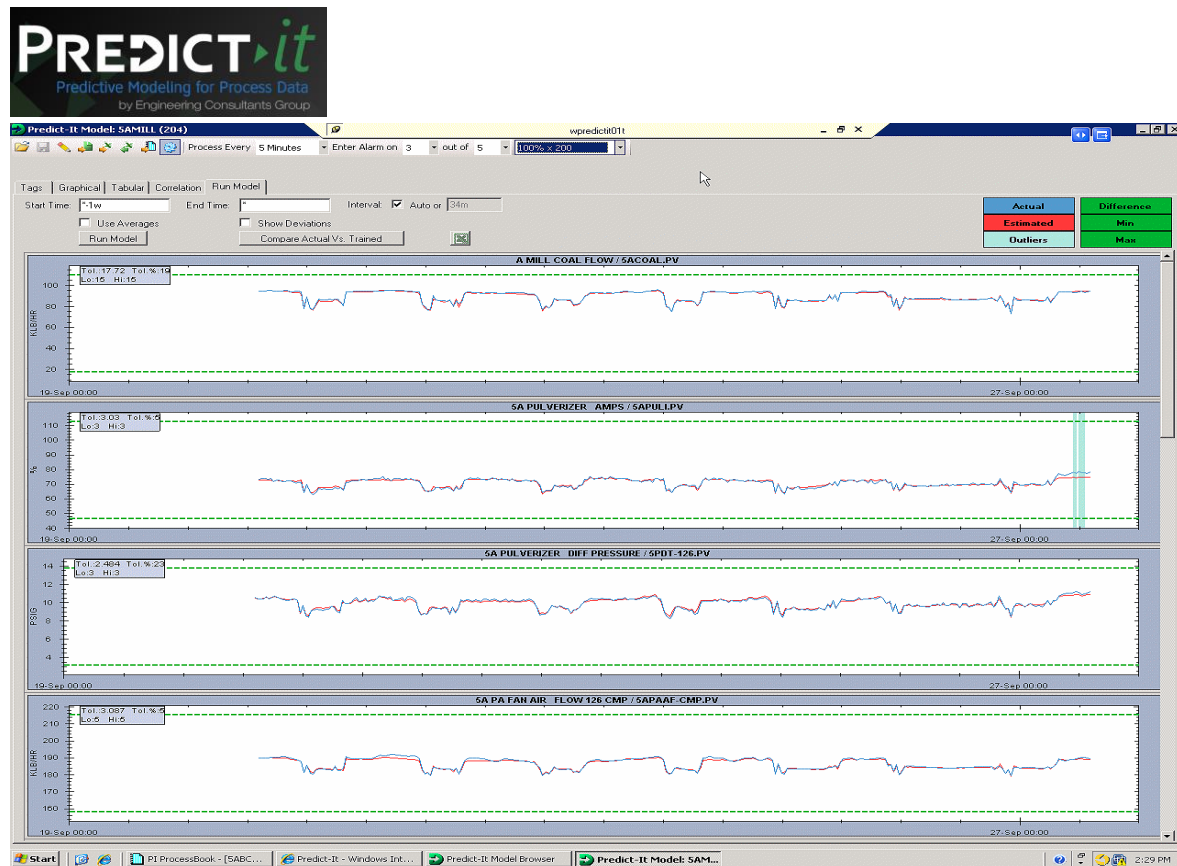
- Engineers & Maintainers setting up Process Book and Coresight pages to monitor assets (asset owners have a better understanding of asset health and performance).
- Data mining time reduced across MO. Quality of reporting starts to improve.



OSIsoft's Partner Products Accelerate Value Realisation

Operational Diagnostics Centre: Advanced Pattern Recognition

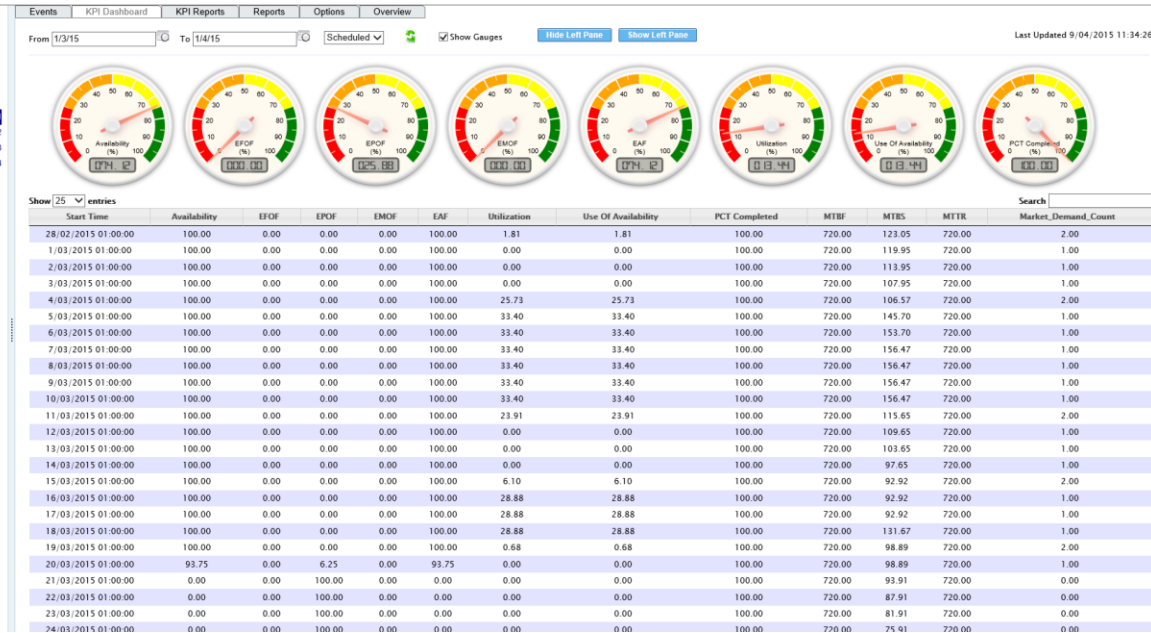
- > New capability
- > Complements site CM efforts and asset health assessment efforts
- > Maximises P-F time for many failure modes
- > Alternative to preventative maintenance (Save \$, Increase Reliability)
- > Increases chance of detecting destructive and costly failure modes
- > Works on PI System data base (read from and write to)
- > Easy to set up and tune (fast value with minimum human resources)
- > Well priced
- > **Easy to install and deploy, with the support of the OSIsoft EA**



OSIsoft's Partner Products Accelerate Value Realisation

New tool for accurate tracking of Asset Performance

- Accurate and repeatable asset performance data
- Automatic allocation of loss codes
- Works on PI System data base (read from and write to)
- Reporting Governance platform
- Scalable solution that can produce higher resolution data as AGL matures
 - Corporate reporting resolution now
 - Reliability management resolution in the future
- Well priced
- Easy to install and deploy, with the support of the OSIsoft EA**



2015 Expansion: AGL Macquarie and Solar

- OSIsoft PI System licence increase by 4795MW (4 power stations)
- OSIsoft EA extended by 7 years
- OSIsoft PI System adopted as standard data historian system for AGL Merchants Operations (31 power stations, 10,161MW)



What next?

Short term 12 – 18 months

- AGL Macquarie and Solar PI System role out
- Build PI System alarms and events capability
- Build SAP BW to OSIsoft PI System connection
- Phase two of RtDuet configuration (eliminate all excel spread sheets from reporting data chain)
- Continue ODC PredictIt capability build program
- Role out ODC and RtDuet to AGL Macquarie
- Continue to develop SharePoint site

Medium to Long term 18 – 36 months

- ODC APR capability actively used to improve maintenance effectiveness and maximise reliability
- ODC Thermodynamic tracking in place and actively reducing fuel throughput, reducing fuel cost and associated maintenance cost
- Most reporting functions automated and controlled
- Improved maintenance alarm system developed
- Healthy data culture driving all AGL MO stake holders to make the best possible decisions day to day

Continuously Utilise OSIsoft EA to:

- Ensure data culture at all sites continues to improve
- Support value realisation program
- Assist PI System changes
- Pursue value from new PI System capabilities
- Assist in introduction of new data tools

The AGL 'Operational Excellence' journey continues

In a highly volatile yet oversupplied electricity market only the Generation Assets that have the lowest cost and highest performance levels can survive. AGL will continue to utilise the OSIsoft PI System data infrastructure and the associated EA to assist the journey to Operational Excellence to ensure our company is positioned as best as possible.

Having our real time data in one place has opened a world of possibility!



Business Challenges

- A. Fast growth had led to disparate and broken data systems
- B. Good quality data is not available to ensure best decisions are made
- C. Capability to transition to condition based maintenance is hampered

Solution(s)

- A. OSIsoft PI System data infrastructure supported by EA relationship
- B. DATA culture transformation at all levels
- C. OSIsoft Partner products assist value realization (Predict It, RtDuet)

Results and Benefits

- Asset Performance improvement (failure modes being sensed early and managed optimally)
- Asset Performance Data precision improving
- Legacy data solutions starting to be decommissioned
- Future maintenance savings are now possible via APR

Questions

Please wait for the **microphone**
before asking your questions

State your
name & company





THANK YOU

Knowledge, if it does not determine action, is dead to us.

[Plotinus](#)

Roman philosopher (205 AD - 270 AD)