


Industry: Power, Energy

Eskom Holdings Limited

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“Through the Wonderware solution platform and ArchestrA technology, the PDS system has succeeded in bringing the plant automation and information technology worlds within generation together.”

John Viljoen,
Corporate Consultant for Generation Business Engineering, Eskom

Eskom’s PDS project is helping the company see the light!

by Wonderware Southern Africa

Goals:

- To merge the plant information world with the company’s information technology environment;
- To turn plant data into useful information that would be openly available;
- Improved performance indication;
- Improved incident response.

Challenges:

- Structuring a data model in compliance with Eskom’s Generic Plant Breakdown Guide and the ISA-95 standard;
- Conforming to Eskom’s structure adjustments half way through the project.

Wonderware Solution:

- InTouch HMI;
- Wonderware System Platform.

Results:

- Real-time plant data;
- Standardization facilitated the reduction of engineering effort, rapid adaptability to changes and elimination of disparate information solutions;
- Significantly highlighting the benefits that can be derived from open access to real-time and useful plant information;
- Closer relationship between plant and IT and the different needs of both disciplines;
- Numerous applications are now using the PDS data and all the information is available anywhere to any qualified person;
- PDS is a business enabler that improves the ability of people to conduct their business more effectively.

Johannesburg, South Africa - Eskom Holdings Limited is a vertically-integrated operation that generates, transmits and distributes 95% of the electricity used in South Africa. The company is among the top seven utilities in the world in terms of generation capacity and among the top nine in terms of sales.

Eskom Enterprises, the wholly-owned subsidiary of Eskom, together with its subsidiaries, serves as a means by which all the non-regulated activities of Eskom, both inside and outside South Africa, are carried out. Eskom Enterprises' core lines of business are infrastructure development, energy business operations, specialised energy services and the pursuit of key opportunities in related or strategic businesses, such as information technology and telecommunications.

The operations of Eskom are located in South Africa. Eskom Enterprises has operations on the African continent, with its head office being located in Johannesburg, South Africa and other offices in Uganda, Nigeria and Mali.

Oil and electricity are the 21st century's energy hot potatoes. At the start of 2008, South Africans had a small taste of what life without electrical energy would be like - intolerable. That's why Eskom is investing a great deal of energy, finance and technology into understanding the behavior and status of its complex grid and generation facilities on

a national level with an initiative that is known as the Plant Data System or PDS.

Background - Plant Information Issues

“The drive for increased reliability and efficiency of operation requires better plant information in real time,” says John Viljoen, Corporate Consultant for Generation Business Engineering at Eskom. *“The plant condition is deteriorating due to ageing which prompts the need to get a better handle on condition monitoring information and since electricity supply must match the demand at all times, accurate production information is critical.”*

Traditionally, process automation solutions provide operating information to help operators manage their plants more effectively but, according to Viljoen, this is only one aspect of the information spectrum necessary for Eskom to be more effective. *“Engineers, for example need asset information for asset lifecycle management. It's not as if we lack the data, we have masses of it at plant level but useable information is not readily accessible.”*

Information Technology Issues

While Eskom's IT infrastructure focuses on improved business performance and efficiency, it is nevertheless a transactional environment not suited to the real-time world of plant production. *“As far as IT is concerned, plant control systems are black boxes that we don't understand,”* says Vicki Naudé, Senior Advisor for Generation Information Management at Eskom. *“Our integration and storage methods focus on transactional systems in a fragmented and outsourced IT infrastructure that isn't suitable for the real-time plant environment. So the intention is to broaden the scope of IT to include plant information while providing for the necessary levels of security.”*



Figure 1: Eskom's "shop floor". Each of the coal-fired units typically consists of a boiler and a 600MW generator - although this can vary.

This left Eskom with the challenge of managing the escalating complexity of merging its plant

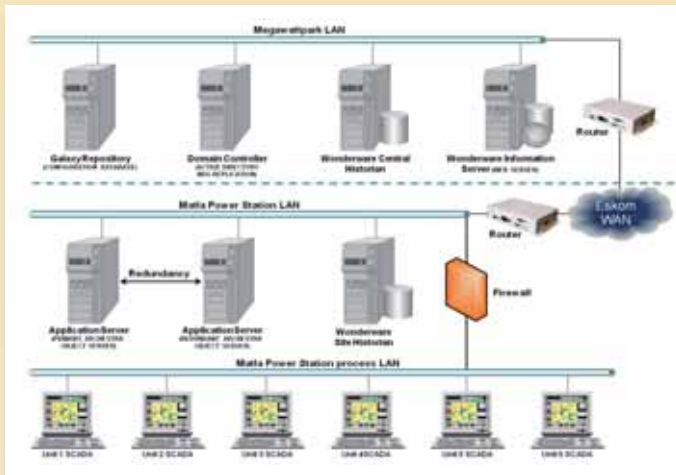


Figure 2: Topology diagram showing the relationship between head office (Megawatt Park) and power stations – only the Matla power station is shown here.

information world with its information technology environment.

Project Objective

The Plant Data System project goal is to make plant data openly accessible, in a standardised format, to every area of the business that can use it to improve the bottom line. In order to do this, plant data would have to be readily transformed into useful plant information in order to meet the specific information needs of personnel at different levels.

Hopefully the more effective use of plant information would have ultimately resulted in more refined performance indicators, better plant optimisation and better resource allocation. Plant data could also be delivered to specialist engineers in order to improve incident response.

Project Requirements

Any solution must meet the need of real time information to support both operational and business decisions while also addressing the issue of standardisation. “Each power station is unique and in the past, there had been no attempt at standardisation so that they all had different control and operational systems,” says Viljoen. “Since the natural tendency is for people to improve their information systems, we didn’t want a proliferation of different solutions with each

power station implementing their own ideas. So, a primary requirement was standardisation that would eliminate duplication of engineering effort, interface development, solution deployment, etc.” Eskom would select a solution based on the least cost but that would provide the required functionality. “Such a requirement would indicate a centralised solution rather than the far more expensive alternative of multiple and diverse information systems,” adds Viljoen. “Another advantage of basing solution selection on cost is that one of the major cost components of such systems is licensing, which is based on tag volume. By purchasing half a million tags for the whole of Eskom, we spent significantly less than if each power station bought, say 50 000 tags of its own. So, according to our structure, buying technology that would meet these requirements was seen as establishing a platform enabling the various parts of the business to improve their performance. In other words, we have installed a business enabler.”

Solution Selection

Eskom issued an open Request For Proposal to the market and the Wonderware solution was deemed to offer the best cost / functional performance ratio. The ArchestrA framework was ideally suited to the rapid deployment of a standardised solution across all the power stations and web based viewing enabled a cost effective method of managing a large number of simultaneous users. The combination of Wonderware System Platform, Wonderware Historian, InTouch HMI (Human Machine Interface) and the Wonderware Information Server met all the specific requirements for real-time data management. Eskom selected ArchestrA-certified system integrator Bytes Technology Group because of the company’s track record of implementing large and small PDS-like solutions on-time and in budget, its existing knowledge of Eskom solutions and its numerous awards for the successful implementation of integrated ArchestrA-based Wonderware solutions.

Plant Data System Project Description

With the project goal of providing a standard platform in order to obtain Generation plant data

