

# National Grid (UK)

The energy business has seen a substantial change the last years as the infrastructure could barely keep pace with the growth of the general globe population and business. There are clear strategies set by governments to keep up with investments needed to grow GDP at the rate they want to. Dealing with legacy systems in Europe and the USA does not always speed up investment and technology growth. In emerging economies, the infrastructure is built almost from a new blue print, allowing newer concepts and technologies to be used. The next two cases show that these new visualization concepts improve the overall efficiency of the transmission operations. Situational awareness is improved by replacing the semi-static overview picture of a mosaic wall with a real dynamic projection wall using dynamics in color changes, animations, dynamic lay-out changes depending on the real time situation. The two examples shown here are the National grid in the UK, with help of Barco's partner TEW showing GE's EMS system 21xA and PLN in Indonesia, using Siemens EMS system Telegyr.

National Grid (NG) dispatches and transmits electricity currently generated by over 128 generators to suppliers who meet the demands of over 28 million customers throughout England and Wales. Since April 2005 NG have expanded their operation to include Scotland and this has necessitated an upgrade and expansion of the existing facilities to monitor and track the usage of electricity.

TEW were awarded the contract to install a new and dynamic Barco display solution that would enable the NG to extend their coverage to include Scotland. TEW Engineering Ltd provides a unique combination of experience and capabilities in the provision of control and information systems throughout the world. TEW have specialized in the control room environment for the last thirty years and are widely recognized as a market leader for the design, manufacture and installation of systems for a wide variety of market sectors.

Barco acknowledges TEW's expertise and considers TEW a prime utility partner in the UK. The fundamental strength of TEW is the ability to provide clients with a total solution and this is one of the key reasons they were selected by the National Grid for this project. Their total solution approach is made possible with in-house facilities that cover all aspects of design, manufacture, testing, installation, commissioning and training. TEW are also able to provide a lifetime of support and solution upgrades and this has certainly been of benefit to National Grid over the years.

Barco Control Rooms division extensive experience within the utility and process control industry extends far beyond the provision of the display. As well as working closely with TEW on the implementation of this project, Barco is also able to provide an all embracing on going support service directly to NG.

Richard Spencer, Chief Executive at TEW stated "We get particular satisfaction from turnkey projects such as the one at the National Grid where we have the opportunity and privilege to work with a long term customer and provide them with a technology refresh and develop and expand their facilities to meet future needs." Spencer continued "The National Grid were very confident with the Barco solution following visits to other Barco customers and the customer center in Belgium making Barco and TEW the perfect combination for them".





## PLN (Indonesia) upgrading master station Java-Bali control center system

“ New visualization concepts improve the overall efficiency of the transmission operations ”

Work on site commenced in September 2004 with the provision of a temporary screen being installed in front of the existing mimic wall and two Barco projectors were used to provide a continuous display of the network status. The extensive work involved removing the original equipment and building of the new wall and during this time the control room remained in full 24/7 operation negating the need for any operators to be re-located. This was a significant factor to the National Grid.

Before the new wall could be built TEW undertook an ergonomic review of the room and decided that the new wall should, in fact, be slightly curved. The curved wall had implications on the room infrastructure and design and meant quite a few changes to the building layout that TEW eagerly undertook, again, causing minimal disruption to the operation of the room.

The new display wall comprises of 40 (10x4) Barco OVERVIEW 67" rear-projection cubes with dual lamp technology and SXGA resolution - 1280 x 1024 pixels. The total wall resolution is 12800 x 4096 pixels.

The JCC is located in Gandul, a suburb of Jakarta. As the national control center, it is responsible for monitoring and controlling the interconnected 500kV transmission grid within Java-Bali as well as maintaining the interconnected grid frequency stability. The JCC also monitors the 150kV and 70kV networks that fall under the operational jurisdiction of four area control centers within Java, via inter-control center links. The peak load in the Java-Bali control area was recorded at 14821MW.

The Java-Bali Control Center project replaces the existing VAX VMS based Elenas (Cegelec/Areva) SCADA EMS with the latest SUN-platform based SINAUT Spectrum SCADA EMS 4.4 to provide the following critical real-time operation functions:

- Supervisory control and data acquisition to collect and control real-time data from 400 high voltage substations across Java-Bali.
- Data archiving and reporting to provide long term archiving and retrieval facilities for critical historical data.
- Automatic generation control to calculate generation MW correction to regulate the grid frequency to 50Hz and to monitor the system MW and MVAR reserves.
- Network analysis and optimization to calculate and analyze the network load flow in normal and contingency cases; and to provide control settings



to achieve generation cost and network security optimization.

- Dispatcher training simulator to provide a replica of the real-time system in a simulation environment for training new dispatchers and to simulate various normal and contingency operational scenarios.

The hardware and software system was factory implemented and tested at SEMIS Singapore in 2004. It has been commissioned on-site where real-time connections to all 500kV, 150kV and 70kV stations within the Java-Bali network have been tested. The new system has gone live to take over the real-time operational Java-Bali Control System in August 2005.

