

## **Control system grows with photovoltaic plant as Azerbaijan builds national renewable power network**

**Operators of a 22MW photovoltaic park in the Naxçıvan Autonomous Republic in Azerbaijan can control all its 8000 solar panels from one SCADA interface, which is designed to be easy and intuitive to use. The control system has been configured so that it is simple routine to accommodate extra equipment as the facility grows over the coming years.**

Naxçıvan solar plant is located between Turkey, Iran and the Caspian Sea and has steadily been modernising its infrastructure and developing its economy in recent years. A mineral rich nation it has a long history of mining and quarrying, mainly located in its desert and rocky upland regions. About one-third of the country is fertile plains, so it also has a strong agricultural sector. However, it wants to develop a complementary range of modern industries, hoping that diversity will increase economic stability.

In order to foster a healthy and vibrant economy which is also sustainable, the government is pursuing a policy of developing an integrated electricity grid. This is based in a large part on balancing renewable generating sources, including wind, hydro, thermal, biofuel and solar.

The Naxçıvan solar plant is the largest photovoltaic installation in Azerbaijan and plans are in place to grow it further, in stages as demand increases. For this reason, the control system was designed to be flexible and expandable, while also being as easy to use as possible.

One of the key characteristics of the SCADA system is its ability to instantly identify faults and autocorrect them wherever possible. If a fault cannot be autocorrected an alarm is triggered to alert the operators so that they can take appropriate action promptly.

The control system is based on Progea's Movicon.NExT platform, which is available in the UK through Products4Automation. This is a revolutionary modular SCADA (supervisory control and data acquisition) system that can be expanded and adapted to meet the changing needs of the plant it is controlling. Systems are developed simply by selecting and integrating the desired modules and can be extended or adapted just as easily.

To enhance this futureproofing, Movicon.NExT is also 'open' so can be integrated with control equipment and field devices from a wide range of different manufacturers. At the Naxçıvan photoelectric park the Movicon NExT is installed in a central control room and has been designed so that one single bespoke interface is used to monitor and control the whole site.

The network includes inverters, network analysers, protection equipment and sensors to monitor plant status and production output. It also checks and records environmental conditions, such as sunlight levels, temperature, wind speed and direction so that full performance analyses of the plant can be carried out.

Equipment from many different manufacturers is used throughout the plant and it all connects seamlessly with the Movicon.NExT. The control system can automatically detect any plant malfunction and initiate automated correction procedures so that the site quickly returns to normal working order with virtually no disruption or production downtime. It also logs all incidents for later assessment.

The archiving system stores all operational data relating to the site's inverters and other equipment, along with output levels and environmental conditions so that subsequent analysis can be run on efficiency and performance. Real time and historical data can be presented as graphs, tables or in bespoke graphic displays to help operators quickly verify how well all the site's devices are working.

The user interfaces of the control system have been designed to be clear and simple so that even less experienced operators can quickly build confidence and capability. Higher level information is password protected and available only to senior engineers and managers.

A plant the size of the Naxçivan photovoltaic park naturally produces enormous quantities of data collected from its field devices, in this case about seven million separate pieces of information a month. Therefore, the Movicon.NExT system has been configured to reprocess information at regular intervals by means of the SCADA's scripts and MySQL procedures and centralised it in optimised database tables. These tables are then used to manage data analysis and produce reports on long term operations.

The plant's engineers say the Movicon.NExT system performs well, particularly in managing alarms and helping resolve malfunctions efficiently and effectively. They like the fact that information is immediately displayed on the SCADA screens as well as being logged in the historian. One of the main advantages of this is that in the event of a plant malfunction, the operator can quickly access real time information to determine the nature of the problem, and thus correct it with minimal time loss – often without even leaving the control room.

#### **Photo Captions:**

**Photo 1:** Operators of a 22MW photovoltaic park in the Naxçivan Autonomous Republic in Azerbaijan can control all its 8000 solar panels from one SCADA interface, which is designed to be easy and intuitive to use.

**Photo 2:** One of the key characteristics of the SCADA system is its ability to instantly identify faults and autocorrect them wherever possible.

**Photo 3:** The Naxçivan solar plant is the largest photovoltaic installation in Azerbaijan and plans are in place to grow it further, in stages as demand increases.

## **About Products4Automation**

Products4Automation (P4A) is a specialist supplier of new and innovative software and hardware solutions to the UK market. Product ranges available from P4A include the latest touch-screen HMI's and flat panel PCs, SCADA software and plug-ins, a wide range of SCADA enabled hardware, Alarm plug-in software for large automation systems, and a full range of Production Intelligence software solutions.

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