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FWWD

Autumn 2006

FAST FORWARD WITH **ABB POWER SYSTEMS & PRODUCTS**



Out with the old ...



... In with the new



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Read this issue online:
www.abb.com/ffwd

Published by:
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Climate Change – Is this an opportunity?

Trevor Gregory
ABB UK Managing Director

- > The political parties have finished their conference season with some very powerful messages about how each of them will resolve the Energy Challenge. Technology will play a large part in each of their visions to combat the effects of climate change.
- > ABB is working with many eminent research establishments in conjunction with its own corporate research function to understand how we can develop new and improved products and solutions to help combat the huge energy challenge we all face.
- > It is also important that government and regulators seize the opportunity to work with industry to reduce the barriers to technology that's already in use and is delivering cost-savings elsewhere in the world, but which cannot be deployed here for a variety of reasons. Could this be an opportunity?
- > In order to capitalise on our huge offshore wind resource the problem of getting the energy to the demand centres in the South need to be resolved. We have teams working with the Government and other authorities to demonstrate how modern technology can assist in resolving the issues of planning and environmental effects. Could this be another opportunity?
- > It is important for all parties to allow technology to deliver the benefits they seek, and this can only be realised by ensuring that joined-up policy connects with joined-up technology! ABB looks forward to playing its full part along with its customers in delivering the technology to help address the climate change challenge.
- > As you will see in the pages that follow ABB continues to deliver innovative technology. By working with government, regulators, customers and other stakeholders we hope to help the fight against climate change!





Duncan Botting, head of technology and business development for ABB in the UK, continues his look at the Government's latest Energy Review and the challenges it poses for everyone.

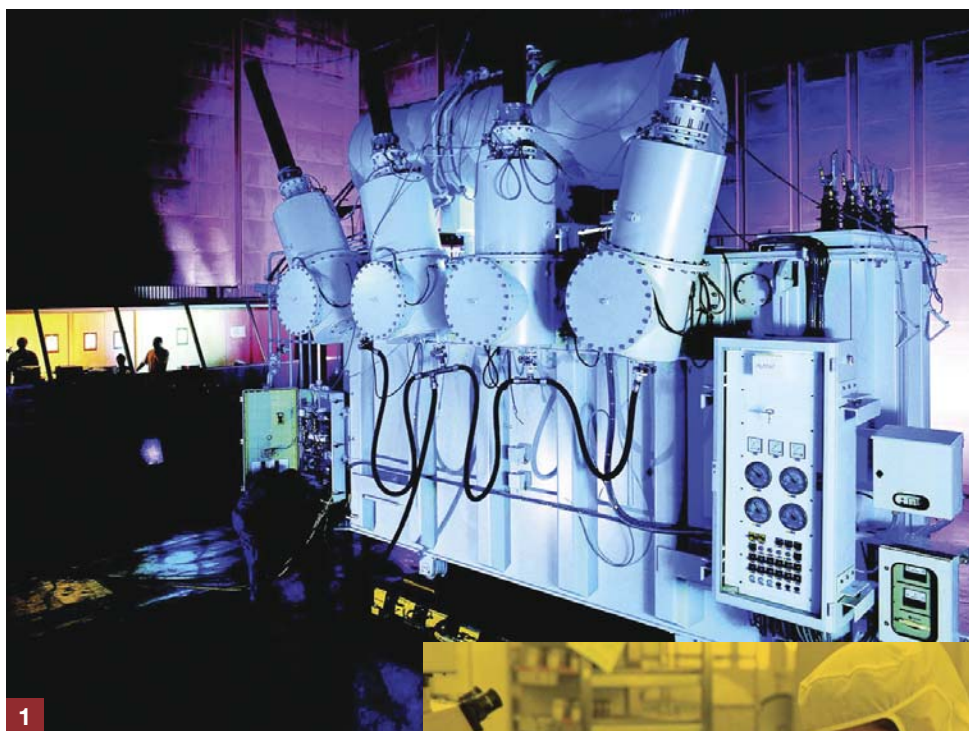
The Energy Challenge – How are you responding?

>> If you are a regular reader of FFWD you will know that ABB brings you many excellent products, solutions and service offerings. You will also have noticed that we like to emphasise HOW we do this: protecting the health & safety of our customers, employees and the general public, safeguarding the environment, delivering appropriate technology, working with government, regulators and customers and all with a passion!

It will come as no surprise that ABB strives to meet the future challenges of our changing world with a similar approach. In order to achieve this we like to work closely with our customers to develop solutions that are appropriate for their needs. Many of our customers have taken this approach and discovered many of the benefits of doing so but some have yet to realise the power of this approach.

As discussed in previous issues the Government's fundamental Energy Review has led to a deep need to develop future solutions in a more flexible, reliable, energy-efficient and secure manner.

You will see that ABB has the ability to bring huge international experience to these complex questions. We also combine with many of the world's best universities to work with our own scientists and engineers to produce remarkable research and development projects that deliver advanced solutions.



1 A power transformer on test at ABB state-of-the art facilities.

2 Testing silicon wafers for ABB thyristor technology.



We are involved with many learned institutes and standards bodies, and advising policy makers and other stakeholders. So how can this benefit you?

In the following pages you will find examples of individual success stories, business cases and technology advances that have benefited our customers in many or all of the aims described.

- Why then would you not want to benefit from such investment and development?
- How are you going to meet your Energy Challenge?
- We would like to fast-forward your business – we are looking

to work with you and for you. We would like to hear how you are responding to the Energy Challenge?

- Why not share your thoughts and respond to: Duncan.botting@gb.abb.com

Alliance powers up for central England



➤ National Grid has chosen the substation alliance in which ABB is a leading participant as its preferred partner for substation development and construction in central England. The partnership will be carrying out a share of the £2.8 billion National Grid contracts to upgrade and develop the electricity transmission system across England and Wales.

ABB and its partners, Morgan Est and Atkins, will be working across the Midlands, Greater Manchester and Liverpool. The initial five-year contract, with potential for a further five-year extension, will be awarded early next year.

Individual contracts will be costed and awarded project by project.

MV package heads for the Niger Delta

➤ Lilliker Brothers, the Rotherham based electrical installation and power engineering company, has ordered a complete package of MV (Medium Voltage) switchgear and transformers from ABB for a distribution substation project in the oil-rich Niger Delta region of southern Nigeria.

The MV package, comprising ABB's ZX1.2 (33kV) and ZX0 (11kV) ranges of primary gas-insulated switchgear, together with a pair of 7.5MVA, 33/11kV, liquid-filled transformers,

will be installed at Ikot Abasi substation as part of a project by the Niger Delta Development Commission (NDDC) to reinforce the public distribution supply between the towns of Ikot Abasi and Opobo.

The Ikot Abasi substation is in a very remote area. The 33kV supply cables linking it to Opobo substation will be supported on overhead towers in order to negotiate mangrove swamps and then on a bridge to cross the 680m wide Opobo river.

The UK's top rail event

➤ ABB will be exhibiting at Raitex 07, the UK's leading rail show. The company is on stand M34.

The event is taking place at ExCel in East London and runs from 20 to 22 February.

The rail industry is booming with passenger traffic at its highest level since the 1960s. Freight traffic is growing too.

ABB will be showing a wide range of solutions covering both the power systems

and automation technologies sides of its business.

More information on the event can be found at: www.railtex.co.uk



Port Ham moves indoors

➤ As ABB prepares Central Networks' new £12 million 132kV indoor GIS (gas insulated switchgear) station at Port Ham, Gloucester for final commissioning, the old outdoor substation is beginning to disappear from view.



ABB is working with a very experienced contractor, Masterton Demolition, to carry out the 10-week project of removing the old AIS (air insulated switchgear) equipment. As Masterton's site manager, Chris Mann, says, "There is more to the job than simply knocking down the old concrete structures and brick buildings. We need to make sure that the old transformers are drained of oil, that obsolete cables are removed and live cables are fully protected, that copper earthing strips are cut out, that the small amount of asbestos insulation is handled correctly and culverts and trenches are back-filled. And, of course, we are adhering to the very high health and safety standards set by ABB. When we have finished, the site will be left as flat ground, covered by loose chippings."

SVA puts Stalybridge substation protection and automation systems to the test

>> The System Verification Area (SVA) at ABB's Stone engineering facility is currently packed with 60 panels of substation protection and automation equipment as it undertakes out what is probably the largest automated FAT (Factory Acceptance Test) of its type ever carried out in the UK. The equipment, all based on National Grid's standardised NICAP (National scheme for Integrated Control And Protection) philosophy, is destined to play a key role at the new indoor 275kV GIS (gas insulated switchgear) substation that ABB is constructing at Stalybridge, near Manchester.

The Stalybridge NICAP scheme comprises a variety of individual systems that work together to provide complete protection and control of the new 275kV substation and an adjacent 400kV substation, covering feeders, transformers, mesh corners, bus couplers and the overall substation control systems. Over a three-month period, the systems are being given a series of gruelling tests that simulate the behaviour of substation plant such as circuit breakers, disconnectors and earthing switches. The automated FAT, witnessed by National Grid, will provide a complete record of all the tests carried out and, on satisfactory completion, the panels will receive certification for delivery to site.



ABB's unique SVA facility at Stone.

Power supply boost for York

>> ABB has won a £3.3 million turnkey contract to reinforce CE Electric UK's Melrosegate 132/33kV substation – a major 33kV supply point for the city of York. The Melrosegate project will enable CE Electric to respond to load growth in the area by providing the necessary reinforcement to meet the increased demand for power.

The reinforcement work will cover the supply, installation and commissioning of a new ABB 132/33kV 90MVA transformer and associated 33kV switchgear on spare land within the existing

Melrosegate site. It includes the establishment of a new 33kV switch house and control room and all associated civil works, protection/auxiliary equipment and 33kV cable circuit transfers.

CE Electric UK distributes electricity in the North East, Yorkshire and Northern Lincolnshire through its subsidiary companies NEDL and YEDL. The company's electricity distribution network supplies more than 3.7m premises in a 25,000 square kilometre area through a network consisting of more than 31,000 substations, 33,000km of overhead line and 66,800km of underground cable.

INTERNATIONAL NEWS

CHINA

Expanding wind power commitment
China, which is investing more in renewable energy than any other country, is installing a range of ABB equipment in two major schemes: the 150MW Jiangsu Rudong wind park near Shanghai and the 100MW Jilin Tongyu project in north-eastern China. ABB is providing compact secondary substations, distribution transformers, ring main units and pad-mounted transformers.

ALGERIA

Power grid gets \$70 million boost
Sonelgaz, Algeria's state-owned utility, has placed three orders with ABB, worth \$70 million in total. The equipment to be supplied includes two mobile substations, for use where fixed substations are being built, and a package including gas-insulated switchgear, transformers and associated equipment.

MEXICO

Strengthening the power network
CFE, the Mexican state utility has placed a \$50 million order with ABB for substations and other high-voltage equipment to improve the country's distribution and transmission network. The work also includes the installation of 1.8MVA power reactors and a 30km extension to a 115kV transmission line.

SWEDEN

Sun block
ABB has delivered a giant three-limbed transformer to a nuclear plant that has been frequently affected by black-outs caused by solar flares. The three-phase 825MVA, 420/21kV generator transformer contains one of the largest and heaviest cores ever produced by ABB. With three limbs instead of the usual five, the transformer is designed to improve availability and protect the Oskarshamn 2 nuclear power plant from solar flares or storms.

STEEL INDUSTRY

AC system raises steel power quality
Orders totalling \$15 million have been placed with ABB for flexible AC transmission systems (FACTS) for steel plants in China, Oman, Spain and Turkey. Orders include static var compensators, which use FACTS technology to improve the security, capacity and flexibility of power transmission and distribution. ABB has some 200 installations in the steel industry worldwide.

Bernard Johnson, programme controller for the ABB Mowlem Southern Region Power Supply Upgrade (SRPU) team, explains how detailed planning, coordination, collaborative working and an uncompromising approach to health and safety helped make the project so successful that in the end nobody noticed it!

Model railway project



» In 2003, Network Rail embarked on its three-year Southern Region Power Upgrade (SRPU) programme to support the introduction of 2,000 new, more comfortable, carriages. Thanks to features such as central door locking, CCTV and air conditioning, the Bombardier Class 375/376 Electrostar and Siemens Class 450 Desiros trains draw around 23 per cent more power than the old rolling stock from the 750V traction power supply system – the reason for the upgrade.

With 3,196 miles of track, Southern Region is the UK's largest private operator of an electrical distribution system. And we believe that the upgrade was the largest DC project of its type undertaken anywhere in the world.

KENT REGION

ABB in a consortium with Mowlem Railways was one of four regional contractors appointed initially by Network Rail, and was awarded the 'Kent' region – extending from Ramsgate on the coast through to Cannon Street substation in central London. Between 2003 and 2006 the consortium carried out around £80 million of project work, including the construction or upgrading of 27 substations and 17 feeders and installing around 100 panels of ABB ZX1.2 gas insulated MV switchgear and 25km of 33kV cable.

Working on one of the world's busiest rail networks presented a whole raft of challenges and constraints as all site deliveries, possessions and outages had to be planned down to the finest detail. This was especially important because, while the SRPU project was vital for Network Rail's future plans, its over riding need was of course to keep the trains running every day, so potential disruption and delays had to be kept to an absolute minimum.

It was clear that communication and coordination at all stages, from definition, through design, tender for the individual work packages to execution, would be key to the success of this project. So we took the unusual step of co-locating the consortium team alongside the client team in Network Rail's project office in central London. This ensured that, right from there start, there was no 'us and them', but rather



2

- 1 A train passing the new Beckenham substation.
- 2 The new Vauxhall substation located underneath a disused railway arch.
- 3 Craning a containerised substation into position.



3

a seamless partnership that enabled issues to be solved before they became problems.

POSSESSIONS

Management of ‘possessions’ – the windows of opportunity when we could gain access to work on individual sites – was a core element handled by specific team members. This was particularly challenging, as six months is a normal period of notice for a possession, while on some of the busiest routes access was only available at Christmas, so they had to be planned 12 months ahead. Added to this, Network Rail’s operational requirements sometimes meant that planned possessions had to be cancelled at the last moment, calling for the team to think on its feet to reorganise work programmes to maintain the overall project momentum.

Much of the site work was carried out at night and weekends. We also became particularly adept at ‘piggybacking’ on access to sites that had already been granted to Network Rail’s own team for routine track maintenance. Of course, with two different teams on site working with different objectives, careful planning was needed to ensure there was no clash of priorities.

DELIVERIES

Hand in hand with the planning of possessions, the delivery of equipment to the sites was planned with military precision. A great deal of effort went into making this a ‘non-rail’ project where possible, using road access rather than rail to deliver equipment, although there were a number of ‘rail-locked’ sites with no road access. On some sites, the limited access called for specialised rail-mounted cranes to manoeuvre heavy equipment into position. Again this required long-term planning as there are only three such cranes in the country.

In order to keep on-site work and costs down, we made substantial use of containerised substations, housed in robust, long-lasting stainless steel enclosures, which were fitted out off site.

HEALTH AND SAFETY

An uncompromising approach to creating a safe working environment was paramount throughout the project, with the emphasis on minimising potential risk to site operatives. And this was reflected in a remarkable safety record. All work on the infrastructure was undertaken with the RIMINI plan system, which is used to make sure the safest system of work is used when ‘on the line’. In addition we kitted out a safety coach, known affectionately as ‘Thunderbird 3’. This was despatched to the various sites to show videos and provide information and handouts about the specific safety issues that the working gangs might encounter on that site.

INNOVATIVE TEAM APPROACH

Mid-way through the project, we started a substantial work package for the north Kent ring of substations. Because of the way the substations in the ring are linked together we could not take two out of service at the same time without disrupting the network. So we took an innovative approach by constituting a separate, dedicated planning team with representatives from all interested parties. The team was led by Network Rail, and as well as the consortium it also included the SCADA team, the network controller, the outage planner and representatives from the team working on the inner London region of the SRPU, since our work could also impinge on their area. By meeting every week the 12-strong planning team

ensured that the north Kent ring work package proceeded without a hitch.

UNDERNEATH THE ARCHES

The innovative side of the consortium really came to the fore in constructing a new substation in Vauxhall. Space is at a premium in this part of London, and it was difficult to see where the substation could be placed. We hit on the idea of utilising two dilapidated arches of a railway bridge to create a smart new indoor substation. As well as special cladding to make the substation watertight, ventilation and fire detection systems were installed to ensure the complete safety of the enclosed transformer.

PEOPLE

The success of the SRPU project was not just down to procedures. A key aspect was the excellent people we had working as a team across the board – civils, engineering, project management and installation and commissioning staff, supported along the way by admin and specialist safety and possession staff.

At the peak in January 2005, there were around 140 ABB Mowlem project staff, along with many other installation, civils, cable pulling contractors and site staff.

THE FINAL VERDICT

By November 2005 all the new trains were in service, with not one train introduction delayed due to a lack of power, and Network Rail’s view of the overall Southern Region Power Upgrade project was: ‘the project was so successful that in the end nobody noticed it!’

In its unrelenting push for safer working in better environments, ABB has been refining its reporting and monitoring procedures.

Driving for safety and environmental goals

>> Over the years, ABB has earned itself an enviable reputation for safe working on its sites. There is no room for complacency, but a continuous drive over many years is having its effect: minimising accidents and strengthening adherence to safety procedures. Sitting right alongside this priority is a growing focus on environmental issues.

National Grid has introduced a new health & safety scoring system based on the accident triangle. Contractors are given negative scores for accidents and incidents happening on construction sites, but can regain positive scores for successful SHE visits and contacts.

The focus is not just on avoiding incidents but also staying on top of the preventative measures. Training and regular inspections play important parts in reinforcing the positive safety culture that ABB and National Grid regard as paramount.

The safety triangle is updated monthly and shows at a glance how people are performing. The scores of all key suppliers are compared and the best performers will be rewarded.

GROWING AWARENESS

For an organisation the size of ABB, the level of incidents is remarkably low. There were no lost time incidents in one of the latest monthly reports. However, a total of 48 near misses were recorded and these reports have resulted in the removal of the potential hazards.

Overall, there is clear evidence of growing safety awareness among



1 Aerial view of the Stalybridge site.

2 Old structures turned to crushed stone at Norton.

ABB employees, which is reinforced by frequent training and effective management.

SUSTAINABILITY PAYS

ABB pays great attention to environmental issues too. Below we look at some of the most recent examples of how the company is taking a positive approach to sustainability in its processes and on its sites.

CRUSHING VICTORY FOR THE ENVIRONMENT AT NORTON

You might expect the demolition of a large outdoor AIS substation compound to create large amounts of rubble for disposal by landfill. Not so at Norton, near Stockton on Tees, where ABB has constructed a new indoor GIS substation for CE Electric UK that occupies just one-sixth of the space taken up by its AIS predecessor.

After stripping the old mechanical and electrical parts from the old equipment, ABB removed and stored the concrete



2

structures and bases and then brought in specialist plant to reduce them to crushed stone. This material was then utilised for sub-bases, back filling and other civil requirements across the site. Around 1,100 tonnes of concrete has been crushed and reused.

HONOURABLE DISCHARGE

Excavation work for National Grid's Stalybridge substation, being constructed by ABB, required the removal of contaminated ground water.

In order to minimise any effect on the environment, as well as meeting the conditions of the sewer discharge licence, and ensure that the groundwater was contained and treated before disposal, ABB brought in a specialist company to install a water control system.

In the excavation phase, a containment bund and rainwater drain pump feeding the treatment system oil and water separator was

constructed. Water treatment equipment was installed to remove other impurities and a strict regular sampling and reporting regime put in place.

This attention to detail is being maintained during the construction phase.

RECYCLING BLOOMS

Environmental matters are always to the fore at a National Grid substation in Leeds, which also hosts an environmental centre dedicated to sustainable development. When ABB carried out a major upgrade, the whole site team caught the recycling bug.

A large amount of overgrown greenery was cut back and turned into mulch and then dug into the flower borders; some old concrete bases were crushed and used to supplement the top soil for land levelling.

Some trees which had to be removed were used to make flower tubs and decking for the environment trail, and even the packing cases in which equipment was delivered was recycled into shuttering for the new concrete.



Flower tubs made from recycled wood

When the Valhall offshore complex is upgraded in 2009, it will no longer be generating its own power but will be supplied using HVDC Light technology, from the mainland almost 300km away. The result will be safer, more cost-effective energy production and substantially less greenhouse gases.

Bridging the North Sea energy gap with PFS



>> The major redevelopment of BP's Valhall production complex, which includes the construction of a new production and living-quarters platform, will enable the facility to maintain output right through to the middle of the 21st century.

An important feature of the upgrade project is the replacement of existing offshore gas turbines, currently providing power for the five-bridge linked complex, with power from the shore (PFS) electricity delivered directly from the Norwegian mainland 300km away.

Oil is supplied from the platform in the Ekofisk field to

Teesside in the UK, while gas is delivered into Norpipe through which it is transported to Germany.

Since the facility was installed in 1981-82, reserves have grown from 247 million barrels to 1,050 million barrels. It is estimated that 529 million barrels remain to be produced, although the company hopes that it may be able to extract considerably more than this.

Output is running at 150,000 barrels of oil per day, 200,000 barrels of other liquids per day and 5 million m³ of gas per day.

The installation has been experiencing reservoir compaction, seabed subsidence, which has increased water depth by about 5.4 metres over the years. This was a factor in deciding to replace the

original production and compression platform with a new production-hotel facility designed to meet the site needs until 2050.

COST AND ENVIRONMENTAL SAVINGS

Power supply is critical to the performance of the Valhall facility, and with such a long life ahead of it, it is essential to meet strict economic and environmental criteria.

At present power is generated on the field by gas turbines. These will be replaced by a 292km powerlink direct from the shore – an

unprecedented distance for an offshore installation.

ABB's HVDC Light technology will be used to transmit the power from the mainland. This involves taking AC power at 300kV from the Norwegian grid, converting it to high voltage direct current (HVDC), and transmitting it at 150kV through a subsea power cable to the platform, and converting back to AC at 11kV for use on the field. The total power requirement is 78MW-.

This solution is not only cost-effective but it also offers clear environmental benefits - at peak it will eliminate an annual 300,000 tonnes of CO₂ and 250 tonnes of nitrogen oxide, compared with a combined-cycle power plant operating with low NOx gas turbines.

Grid power in Norway is for the most part clean power generated by hydro-electric plants.

Reducing CO₂ output will also cut

costs. This is because such emissions from offshore installations are taxed in Norway. Another benefit is that ABB's HVDC Light system offers very high availability of 98.5-99 per cent – and requires much lower maintenance than on-platform gas turbines.

An onshore converter station is to be built at Lista near Norway's southern tip, and on the platform, conversion of the HVDC power will take place in a dedicated module designed to protect equipment from the effects of salty, humid air.

ABB's new transformer remanufacturing service offers a new lease of life for ageing or faulty power transformers

A new lease of life for power transformers

ABB's new transformer remanufacturing service enables ageing or faulty power transformers to be completely rebuilt and returned to as-new condition, or even upgraded to a higher specification. A remanufactured transformer provides the same performance as a new transformer at a much lower cost. However, the main advantage is ABB's fast turnaround that can have a customer's transformer back in operation in around one-third of the normal delivery time for a new unit.

The UK transformer remanufacturing service has been developed by Mark Turner, operations and quality manager for ABB's worldwide network of transformer service centres, who said: "The re-manufacturing service is targeted at medium and large power transformers from any manufacturer, not just ABB. The comprehensive service includes on-site assessment of the transformer's condition, and arranging for it to be collected and delivered to our factory in Drammen, Norway. At the factory the transformer is stripped down to its component parts and rebuilt with the same care and attention to detail as our new transformers. We then return the unit to site and install and commission it.

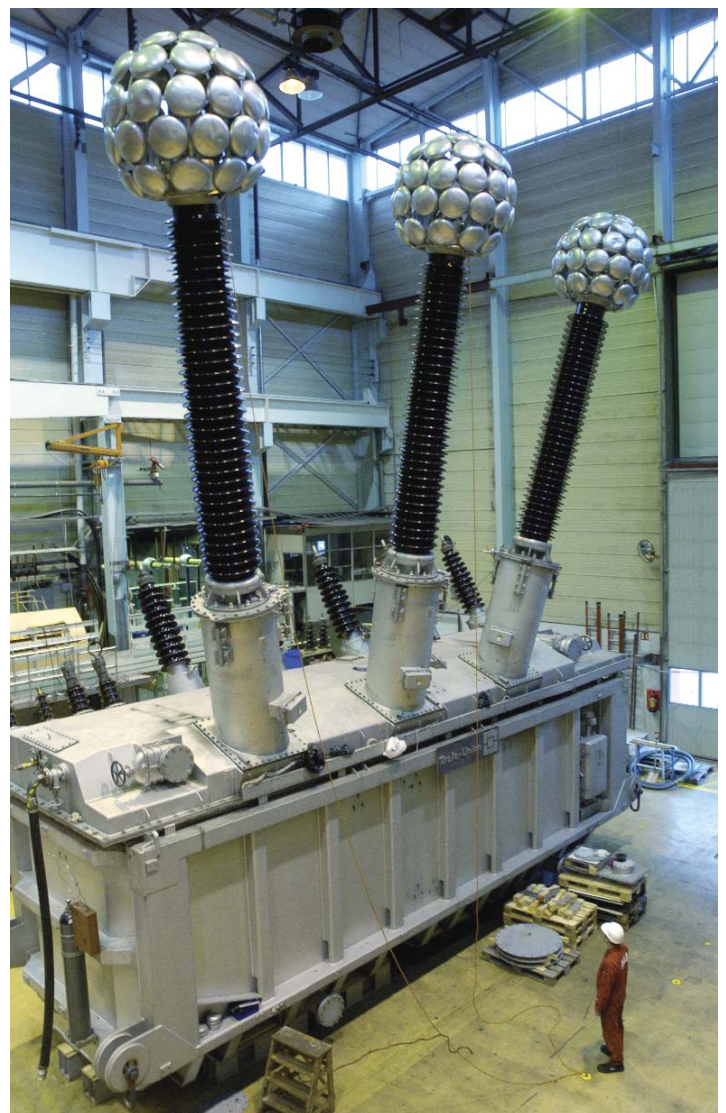
"The cost of remanufacturing a transformer will vary from case to case. But typically, we would expect to have it back in service at around 60 to 70 per cent of the cost of a new unit. However, it is delivery, rather than cost, that will be crucial for many customers, especially as the current growth in demand world-wide for HV equipment is resulting in ever increasing delivery lead-times.

We can have a remanufactured large power transformer back in service in around six months. That's one third of the 18-month delivery schedules now being quoted for new large power transformers."

BETTER THAN NEW

The flexibility of ABB's transformer remanufacturing service enables customers to opt for an upgrade to 'better than new' specification. This could be as simple as a change in voltage rating or could extend to taking advantage of ABB's state-of-the-art computerised design tools to have the transformer completely redesigned to a higher power rating. Other upgrade possibilities include enhanced cooling or rewinding the coils with Nomex® high-temperature insulation material that boosts power, as well as offering significant improvements in lifetime and reliability.

The remanufacturing service will be particularly attractive for the UK's vast installed base of power transformers, many of which were installed in the 1960s and are now near the end of their useful working life. However, the




The Drammen transformer re-manufacturing facility in Norway.

service is also ideal for newer transformers that may have developed a fault or have been damaged by a network event. Whatever the age of the unit,

once it has been remanufactured by ABB, the reborn transformer will be able to look forward to another full working life of between 25 to 50 years.

ABB has developed a specialist retrofitting service for HV surge arresters that provide a cost-effective route to update outdoor substations to modern specifications.

HV surge arresters provide lightning protection

 ABB's surge arrester retrofit service enables the transformer circuits in outdoor high voltage substations, typically up to 400kV, to be upgraded to a high level of protection against the damaging over-voltages created by lightning strikes. This provides an efficient and cost-effective method for increasing the security and reliability of the substation operation and minimising interruptions to the power supply delivered to consumers.



The retrofit service utilises ABB's well-proven Pexlim surge arresters. These use zinc oxide (ZnO) blocks in a composite silicone rubber housing that is extremely resistant to environmental pollution and vandalism. The material offers the very highest safety levels since it is self-extinguishing and will fail safely rather than exploding when over-stressed.

In new substation projects, the additional cost and complication of installing surge arresters is relatively small. However, retrofitting surge arresters to existing installations is much more challenging, as suitable overhead mounting gantries, typically of a 'goalpost' design 20m high and 21m in span, have to be transported on site and erected by crane. There may also be a need for additional foundation works and possibly piling.

Tom Smith, ABB project manager responsible for the surge arrester installation service, says: "Our surge arrester retrofit has refined its skills in 39 installations already completed successfully for UK customers. Having experience of just about every possible permutation enables us to provide very fast turnaround, with installation usually completed within a week.

"A key aspect of the service is the careful advance planning and coordination we provide to ensure that the installation work ties in with planned outages, so that we can minimise potential disruption to the substation operation. And we have developed safe working methods that enable us to carry out a significant proportion of the civil works, even piling for foundations, without having to take an outage."

ABB's COM 610 is an embedded communication gateway designed for both industrial and electrical utility applications.

Integrated electrical network monitoring and control

ABB's new COM 610 meets the challenge of providing plant managers and users with a truly integrated electrical network monitoring and control system that does not rely on specifying a single manufacturer for all equipment. It acts as a reliable, cost-effective hub for connecting protection relays and terminals with differing protocols to the network control centre.

The COM 610's communication architecture is based upon proven protocol implementations, utilising OPC frameworks (that provide open connectivity via open standards) that guarantee the flexible and extensive use of information. There are no theoretical limits on the number of master/slave protocols, lines or devices, providing fully flexible configuration. It is delivered with pre-installed software, so all the installer needs to do is to connect it and download the cross connection configuration.

INDUSTRIAL DESIGN

The COM 610 features a compact and robust design that makes it ideal for harsh environments. Its enclosure offers protection to IP50 and it has no moving or other vulnerable parts, while its modular software architecture guarantees easy expandability and ease of use.

SAVINGS IN COMMISSIONING

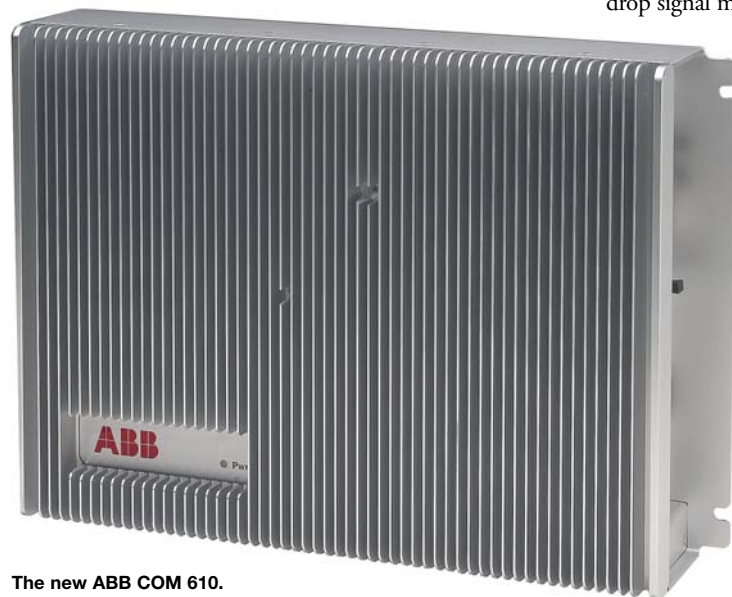
Information modelling within the COM 610 gateway is based on the IEC 61850 standard that ensures open and flexible information management. The intuitive configuration tool utilises pre-defined data templates for easy drag-and-drop operation. When the configuration is complete, it is downloaded to the gateway over a TCP/IP connection, and the COM 610 is ready to use.

HIGH LEVEL OF INTEGRATION

The COM 610 gateway is open to any master system using *de facto* master protocols. It is also fully compatible with ABB's MicroSCADA technology – for the creation of complete automation solutions.

OPTIMISED SUPERVISION

Monitoring the COM 610 is made simple by using either the CET configuration tool, based on the IEC 618570-7 model with drag-and-drop signal mapping, or a standard web browser.



The new ABB COM 610.

CONTACTS

For further information about any of these subjects please visit www.abb.com/ffwd or contact us as follows:

| | | | |
|---------------|----------------|------------------|----------------|
| Substations | – 01785 825050 | Power Quality | – 0151 3578400 |
| HV Switchgear | – 01925 741457 | Transformers | – 01925 741469 |
| MV Switchgear | – 01925 741433 | Asset Management | – 01785 825050 |
| Automation | – 01785 825050 | Wind Power | – 01785 825050 |
| Service | – 0845 6011946 | General Enquires | – 01785 825050 |