

RADIUS



Integrated Utility Services client newsletter

Sweet success

Liquorice Park win puts IUS on the map in the North West

Brain power

Learning from uni experience

Midlands mission

Central Network keeps team busy

Hawking solutions

Flying in to help the jet builders

Welcome to the second edition of RADIUS, the client newsletter of Integrated Utility Services (IUS). It has information about how IUS has helped customers including Network Rail, Central Networks, BAE Systems and the University of Birmingham.

If you would like to find out more about the case studies in this edition, or you would like to discover what IUS could do for you, please contact:

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Expanding: the project management team in Hucknall.

A university challenge

With its appetite for electricity having doubled over the past seven years – and with ambitious plans for considerable further growth – the University of Birmingham has to keep its power supply constantly ahead of demand.

In particular, aspirations to double the number of students and increase the research programme at the School of Medicine called for special attention.

“The fact that the original electricity supply to the School of Medicine was a single dead-end feeder meant that security of supply was an

issue – particularly for medical experiments, some of which have been continuing for many years,” said the university’s area maintenance officer, Ian Petrie.

“Although we had installed our own substations some time ago, we now wanted to upgrade the feeder to a self-healing ring main which would provide the security we need, and also to increase the power capacity to enable planned growth in the future.”

IUS won the competitive tender, and moved into action against a rigid timetable which called for minimal disruption to normal working in the university buildings.

“The clock was ticking; we had to complete the first change-over to a tight schedule but we were up for the challenge,” said IUS project manager, Dave Harker.

“The second challenge was to co-ordinate the routing of the cable, as we needed to cross both a road bridge and a canal bridge to reach the various buildings involved. There was a lot of project management involved with the client and the local council to achieve our goal.”

All told, IUS installed 4,000m of 185mm HV cable through the landscaped university grounds and across public highways.

Time was of the essence

in all stages of the project. Five substations were also upgraded, with the first posing particular time pressures, as the replacement transformer, HV switchgear and new LV pillar had to be completed in just a single weekend to protect supplies to sensitive computer equipment.

If time was the challenge throughout much of the project, access to the final substation in the School of Medicine’s basement proved a problem at the final stage in the link. To overcome this, IUS arranged for the new switchgear to be craned over the building to its new position before



Right at the heart of Central Networks

As Britain's largest electricity Distribution Network Operator (DNO), Central Networks brings power to 4.8 million customers across the East and West Midlands through 133,000km of underground and overhead cables and via almost 97,000 substations.

That all adds up to a very busy life for the team of 100 IUS people who not only inspect and maintain this vast infrastructure under a framework contract, but also provide tree management services and carry out a programme of major installation projects.

As general manager of the IUS team, Lee Maxwell is keenly aware that his team – which is likely to expand by around 50% in the next twelve months – has to deliver against clearly-defined targets set by the client on cost, performance, safety and customer service.

"Just as Central Networks has to provide a reliable electricity supply to all its customers, from the Peak District in the North to

parts of Bristol in the South, and from the Welsh Borders right across to the Lincolnshire coast, so we have to make sure we have all the skills and resources needed to support them," he said.

Operating from its base in Hucknall and a supply depot in Grantham – soon to be joined by another in Cannock – the team recorded some impressive statistics in a single year when, in addition to inspecting 10,000 substations and more than 8,000km of overhead line on foot and by helicopter, they laid more than 140km of new cable, maintained 329 substations, carried out almost 2,000 service replacements and installed almost 700 new LV connections.

This year's programme is equally diverse and wide-ranging, including a mix of inspections – almost all using non-intrusive techniques – maintenance, new cable installations, civil refurbishments at 500 sites

as well as another batch of service replacements and new connections. The team also provides out-of-hours stand-by cover for faults and emergencies.

Major projects currently on the go include providing an increased supply to RAF Coningsby – home of the first RAF Typhoon squadron as well as the famous Battle of Britain Memorial Flight – which involves modifications to the Sleaford and Tattershall primary substations as well as the installation of 20km of 33kV cable.

Work has also started recently to reinforce the electricity supply to the Toyota car factory in Derby which will see the commissioning of a 132/11kV grid transformer, while other projects include installing a new primary substation at Northampton East, and relocating another substation in Sleaford Road, Boston as part of a development by supermarket giant Asda.

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completing the installation.

"As many as 70 vital experiments could have been lost had the power gone off, but we were very pleased with the way IUS kept everything energised throughout the project," said Ian Petrie.

"We now have a ring main which will be completely monitored and able to maintain supplies even if there is a problem with a particular cable. Future growth for the next 40 years is now feasible, which will help us to meet government requirements for more students and more research."



Keeping ahead of demand: Ian Petrie

Essential research

The School of Medicine at the University of Birmingham is a major international centre for research and education, with one of the largest intakes of undergraduate students in the UK.

It employs more than 1,000 teaching, research, technical, support and administrative staff and is completing a programme to improve and expand its research and teaching facilities.

It works closely with teaching hospitals and more than 50 primary care training practices across the West Midlands and has become an acknowledged world leader in the areas of immunity and infection, cancer studies, organ transplantation, endocrinology and neuroscience.

IUS performance on the right rails

IUS has recently completed a two year design and build project to upgrade the 33kV AC and 750V DC electrical infrastructure in the Southern Territory.

This prestigious Network Rail project will facilitate the introduction of 2,500 new units to replace the old "slam door" carriages across the region. IUS's rail director, Ian Harding was delighted to report that the contract had been delivered on time, to budget and against safety targets.

Meanwhile, IUS has won a contract with Westinghouse Rail Systems Ltd (WRSL) to provide power to new signal boxes between Knottingley and Ferrybridge in Yorkshire. It involves the design, supply and installation of low voltage boards, transformers, UPS systems and

signalling panels together with all interconnecting cables.

The project is linked to the installation by WRSL of a modern signalling system capable of dealing with the heavy freight traffic that operates over 107 signalled routes, 35 track miles and 120 route miles.

Non-traction power maintenance is vital for the rail industry, if everything is to run smoothly and it's a field in which IUS has particular expertise. IUS has secured a framework agreement to inspect and maintain 11kV apparatus at locations from Newcastle to Kings Cross.

Project engineer, Andy Martin commented: "IUS develops a team ethic with Network Rail staff and our core skills ideally complement each other."



Southern comfort: a completed Power Supply Upgrade substation near Redhill in Surrey

DID YOU KNOW?

IUS holds:
■ Current Contractors Assurance Case and Link UP accreditation to carry out HV work for Network Rail

Liquorice Park project win secured on cost and quality grounds

Liquorice all sorted

Deregulation enabled Independent Connections Providers (ICPs) to bid for high voltage contracts in any part of the UK. As an accredited ICP, IUS has entered this relatively new arena of opportunity. An early key success was the securing of a contract in the North West of England.

IUS has successfully completed the installation of the electrical infrastructure of the largest new commercial and industrial complex in Manchester's Trafford Park for longstanding client Marshall Construction (West Yorkshire) Ltd.

Marshall's chose IUS following a competitive tender involving a number of bidders, including

the incumbent Distribution Network Operator (DNO). The task was to design, install and commission two 6.6kV/433V substations together with an associated 433V cable network serving all three sections of what was originally called Liquorice Park.

The site is a mixture of some 16 trade, commercial and industrial units – varying in size from 5,000 sq ft to 36,000 sq ft – are attracting their first occupants and cementing Trafford Park's status as Manchester's premier industrial location.

"We have used IUS on a number of projects in the North East and Yorkshire,

and it was on the basis of this previous experience that we asked them to tender for the Liquorice Park project, which they won on quality and on cost," explained a spokesperson for the construction company.

For IUS, the appointment brought a requirement not only to satisfy Marshall Construction as client in terms of cost and performance, but also to work to the specifications and procedures set by the host DNO.

"As any deviation from the DNO's requirements and procedures could have delayed the project, it was important that we established strong relationships with

them," said IUS project manager, Dave Burrow.

"In effect, we had two clients who both needed to be kept happy, and we succeeded in doing this while presenting a single face to Marshall Construction.

"Despite challenging hurdles, such as the need to fill some under-road ducts with Bentonite to enable the cables to retain their original rated value, we managed to deliver the entire job on time and to cost.

"This was a high-profile contract, and it has provided compelling evidence of our ability to win contestable connection works and deliver them to an adoptable standard."

Home to Roost

BAE Systems' site in Brough, near Hull, is 'The Home Of The Hawk' – made famous by the RAF Red Arrows display team and acknowledged as the world's most successful jet trainer.

With recent orders from Bahrain and India as well as the RAF, the Brough site is working hard on production of the Hawk Mk.128. IUS has also been busy as the site's resident HV contractor, with recent contracts involving the installation of two replacement 1,000kVA transformers and associated LV cables in the Operations Substation, which provides essential power to the site's computer suites and Mission Systems Development Laboratories.

'We need a power system we can rely on'

"IUS has assisted in combining two existing substations into a single bus-coupled unit with a new 5.8 metre-long LV panel," explained Paul Willingham, of BAE Systems' Site Facilities Department.

"These two transformers will serve buildings that are strategically important to the site as a whole, because they contain our IT infrastructure and software development areas. This is the second phase in the upgrade of our site's older substations."

Aircraft that never leave the ground will play a vital role in keeping safe those that do fly.

The rigs on which the earth-bound airframes of future aircraft will be fatigue-

tested, over thousands of simulated flying hours, will draw their power from a substation installed by IUS at the Brough site.

The new substation consists of an oil-filled transformer, close-coupled to an 11kV ring main unit complete with relay protection. It is one of several projects completed by IUS under a long-running relationship with BAE Systems at Brough, which also includes an operation and maintenance contract of the site's HV switchgear.

The first aircraft to be fatigue-tested from this supply will be the new Nimrod MRA4 Marine Reconnaissance Aircraft, which has been developed by

BAE Systems under a £2 billion contract. The rig will subject the wings, spanning 127 feet with their attached section of fuselage, to stresses calculated to replicate those that will be experienced in service.

This platform will be followed by the new Joint Strike Fighter, which will be fatigue-tested on a second rig, also drawing electrical power from the new substation.

"We need a power system we can rely on, which is available 365 days a year apart from pre-planned outages for maintenance every three years," said Peter Fish, who is engineering support group team leader in the Site Facilities Department at Brough.

"IUS has done work on this site for many years. We have used alternative HV contractors to do a number of installations in the past, but we always come back to using IUS, which has achieved our HV maintenance programmes every year.

"They have always operated safely with flexible working times, and have responded superbly when we have had a fault – they have never yet failed to attend within the call-out period.

"Over the time they have acted as our HV contractors, IUS's people have shown that they know exactly what's required – they have the experience we need, and we're more than happy with what they are doing, day in and day out."



Mission accomplished:
Peter Fish and
Paul Willingham

High voltage in safe hands

More and more organisations are recognising that the care, maintenance and repair of high voltage equipment are all far too important to be left to chance.

That's the reason behind the continued growth of the High Voltage Customer Service (HVCS) provided by IUS, which is now expanding into the East and West Midlands following the opening of a second HVCS regional base at Hucknall, near Nottingham.

High profile customers such as Northumbrian Water, Network Rail, Queen Elizabeth Hospital (Gateshead), and the University of Leeds have been joined recently by HM Prison Service – for whom HVCS now maintains HV equipment at seven prisons.

What they and all other customers receive is the reassurance that their vital high voltage equipment is in safe hands and covered by a maintenance and management system that not only complies with all legal requirements, but is also an effective safeguard against unexpected faults.

While time-based maintenance remains at the very heart of the service provided by the HVCS teams in

Middlesbrough and Hucknall, non-intrusive condition-based monitoring, such as live oil sampling and partial discharge testing, are being used increasingly to predict potential problems and keep high voltage equipment operating at peak efficiency.

Both time-based and non-intrusive condition-based maintenance techniques are included in the latest HSG230 guidelines for the safe operation of high voltage private networks, and HVCS provides a fully-comprehensive service across its maintenance contracts.

"We have the equipment and skills that make us market leaders in non-intrusive maintenance such as live oil sampling and partial discharge testing, which we view as an intelligent enhancement to regular, time-based maintenance," said HVCS manager, Neil Mole.

"Analysis of samples from oil-filled transformers and switchgear provides an accurate view of the overall condition of the equipment, while partial discharge testing – using either ultrasonic or magnetic technology – offers



Testing times: a member of the HVCS team doing partial discharge testing

the ability to monitor discharges from switchgear equipment over a period of time, and to pinpoint latent problems well before they become serious.

"We tailor our package of time-based and non-intrusive testing to meet each client's maintenance requirements, and provide clients with properly-maintained system diagrams and records."

Specialists from the HVCS team inspect more than 3,000 substations every year in North East England, Yorkshire, and the East and West Midlands. You can contact them by calling the Middlesbrough and Hucknall teams on 0800 073 73 73

Safety is Golden

IUS achieved the highest Gold Award from the Royal Society for the Prevention of Accidents (RoSPA) at its first attempt in 2004 and has retained this in 2005.

This accolade follows a complete year in which no member of IUS staff has suffered an injury resulting in time off work.

"This is a quite exceptional record, which emphasises the fact that occupational health, safety and environmental protection are always at the very top of our agenda," said operations manager, John Mackenzie.

Rising to the occasion with Global Cake Company

Leyland-based Global Cake Company – part of the giant US-based Schwan Food Company – put together a business plan to take over an empty cake bakery factory and quickly realised the site's electricity supply needed urgent upgrading.

"Not only did the obsolete HV switches need replacing with modern equipment, but we also required extra distribution capacity to provide the power for an additional production line, as well as to cater for potential future expansion," said the company's

operations director, Miles Lilley.

"Getting this work done quickly was critical to our plan, and I commend IUS for the way they got us up and running on a fast track with no problems."

Within days, IUS's Bill Heward had put together a suitable package that would bring the bakery back to life, and everyone in the project team pulled out the stops to make sure the work was completed in weeks, rather than months.

They installed a new substation with 800kVA

transformer, 11kV ring main unit and associated HV cabling to extend the power supply to another area of the site. The team worked round the clock to ensure that everything could be ready on time.

With an additional production line now up and running, the Global Cake Company's Bridlington bakery is making a wide range of branded and own-label frozen desserts, cakes, pies and fresh cheesecakes for shops and supermarkets throughout the UK.

DID YOU KNOW?

IUS currently holds accreditation to the following:

- ISO 9001:2000 for quality systems and management, updated and audited regularly by Lloyds Register;
- ISO 14001:1996 for environmental management, audited annually;
- UVDB verify; and
- NERS