

# Cisco helps Scottish Power maintain a safe and secure grid and deliver significant annual Opex savings

EXECUTIVE SUMMARY
<b>CUSTOMER NAME</b> <ul style="list-style-type: none"> <li>Energy Networks (UK Wires Business), Scottish Power</li> </ul>
<b>LOCATION</b> <ul style="list-style-type: none"> <li>Bellshill, near Glasgow, Scotland</li> </ul>
<b>INDUSTRY</b> <ul style="list-style-type: none"> <li>Utility</li> </ul>
<b>COMPANY SIZE</b> <ul style="list-style-type: none"> <li>2,500 employees</li> </ul>
<b>BUSINESS CHALLENGE</b> <ul style="list-style-type: none"> <li>Meeting strict safety and availability requirements for the energy industry</li> <li>Comply with industry safety regulations</li> <li>Fund new projects through use of cost-effective technologies</li> <li>Develop the foundation for delivering more applications and increasing data network intelligence</li> <li>Enable new business processes and move towards Conditioned Based Monitoring (CBM)</li> </ul>
<b>NETWORK SOLUTION</b> <ul style="list-style-type: none"> <li>Cisco core network based upon Cisco's Service-Oriented Network Architecture (SONA)</li> <li>Cisco products deployed include Cisco 3845 Integrated Services Routers (ISR), Cisco ONS15454 Multiservice Transmission Platform (MSP), Cisco PIX Security Appliance and Cisco Unified Communications system.</li> </ul>
<b>BUSINESS RESULTS</b> <ul style="list-style-type: none"> <li>Help to ensure safe and secure electricity supply</li> <li>Delivers significant annual operational expenditure saving</li> <li>Helps to meet energy industry safety regulations</li> <li>Enable a highly secure, always-on data and voice communications infrastructure</li> <li>Supports sub-8 millisecond response times for monitoring telemetry device communications</li> </ul>

Energy Networks is using a Cisco Unified Communications system to help improve management and maintenance on Scottish Power's electricity transmission and distribution networks.

## Business Challenge

Energy Networks is the division of Scottish Power that is responsible for asset management of the Transmission and Distribution Networks providing electricity to over three million customers in Central and Southern Scotland, the Merseyside and Cheshire regions of North West England and North Wales. The electricity infrastructure is over 115,000 Kilometres, has 80,000 substations and more than £2.5 billion worth of equipment. Every year Energy Networks ensures Scottish Power delivers 40,000 GWh to its customers. Energy Networks has 2,500 staff and has its headquarters in Bellshill, near Glasgow.

One of the key support functions of Energy Networks is to provide and maintain operational communications around the electricity network and the data network supporting this has to be secure and highly resilient. For example, SCADA (Supervisory Control and Data Acquisition) systems at electricity substations monitor electricity transmission and supply and report on problems and faults.



This information has to be communicated to the grid control centre. In the event of a major equipment failure, engineers need to go to the relevant transmission substations and carry repair work or re-energise the power network if the power has been cut off. The engineers need to communicate with the control centre via a secure telephone network which is unaffected by the main power supply.

The telephone system also needs to have additional features such as enabling the control centre to intrude into an existing call if they need to contact an engineer working at a substation urgently. Energy Networks had been using a proprietary telephone communications system, but this had become out dated and was starting to become expensive to maintain and support.



In a drive to reduce costs, utilities need to maximise the life and use of power equipment, but without any degradation to the power supply. To do this they are moving to a conditional based monitoring (CBM) strategy which monitors the current status and effectiveness of equipment, enabling the utility to maintain, repair or change equipment only when necessary. This is in contrast to strategies such as replacing equipment after a period of time even though some of the equipment may still be useable.

Energy Networks could see the benefits of creating a single, integrated IP network for all data and voice communications around its power line infrastructure. When Energy Networks was evaluating various options it found that Cisco offered a number of benefits including more features for voice communications, the ability to integrate with all kinds of complementary systems, a single supplier for all technology and a roadmap to ensure a smooth transition from old to new technology.

## Network Solution

Richard Rutherford, senior systems engineer for Energy Networks, says, "Because the energy industry is highly regulated and safety and reliability are so critical, it is important for us to use a large and established supplier like Cisco. We need to ensure we can get the support and backing we need, when and where we need it. And we need to work with a company that can support our vision for building an infrastructure capable of delivering greater network intelligence."

The telecommunications network infrastructure at Energy Networks is based upon Cisco's Service-Oriented Network Architecture (SONA) which paves the way for networks capable of improvements in operational performance, reducing Customer Minutes Lost (CML) and Customer Interruptions (CI). Also providing, business agility, customer satisfaction and cost savings.

The use of the network as a platform provides a framework of services which are automatically available to satisfy Energy Networks' new business demands and which deliver reduced risk and improved availability.

The first step in Energy Networks' realisation of SONA is a Cisco Intelligent Information Network (IIN) which allows a network to be more aware of and responsive to the needs of the applications, resources and devices connected to it. Energy Networks has deployed a dedicated Cisco IP network that supports both voice and data communications to control and maintain Scottish Power electricity Transmission and Distribution networks.

Cisco Unified Communications is the first in a series of services and solutions that Energy Networks is deploying. The network serves as the foundation for the Cisco Unified Communications system that includes 500 Cisco Unified IP phones distributed to 130 transmission substations. Energy Networks' use of the Cisco Unified Communications system is exclusively for operational day to day maintenance and emergency communication in relation to the grid operations.

As the next step in moving towards the SONA vision, Energy Networks is developing 'intelligent' substations which will enable monitoring and control devices in substations to communicate with one another. Currently, settings at a substation have to be altered manually, but with an 'intelligent' substation this may be done remotely and settings at associated substations will also be adjusted automatically via data communications around the Cisco network.

The Cisco solution at Energy Networks has been implemented by THUS in collaboration with the Cisco Gold Certified Partner, NextiraOne.

## Business Results

“The Cisco network is critical - I really can't stress enough how important this is to us. If the system doesn't work, the lights, literally, will go out,” says Rutherford. “If we can't communicate with a substation in the middle of switching out a transmission line, and there is a problem that engineers can't discuss with control, then that power line could go down and we risk losing customers. And then there could be penalties to pay. And if we don't have the systems in place to ensure we can provide a continuous service or re-connect customers quickly the penalties can increase.”

PRODUCT LIST
<p><b>Routing and switching</b></p> <ul style="list-style-type: none"> <li>• Cisco 3845 Integrated Services Routers (ISR),</li> <li>• Cisco ONS15454 Multiservice Transmission Platform (MSP)</li> </ul>
<p><b>Security</b></p> <ul style="list-style-type: none"> <li>• Cisco PIX Security Appliance and Cisco Unified Communications System</li> </ul>
<p><b>Voice and IP Communications</b></p> <ul style="list-style-type: none"> <li>• Cisco CallManager</li> <li>• 500 Cisco Unified IP phones</li> </ul>

The power industry is heavily regulated, especially when it comes to reliability and availability of power to the consumer. This means that fault signalling, which relies on the Cisco network to communicate between the control centre and substations, needs to be both accurate and fast. The Cisco network is helping Energy Networks deliver sub-8 millisecond response times for

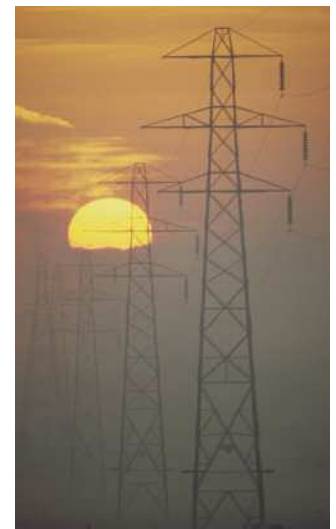
sending and receiving information to and from monitoring devices in substations.

Rutherford adds, “Because of the strict safety requirements and regulations imposed on network operators, if Energy Networks does not have secure and well protected communications for a specific power transmission line then it may have to turn the line off. That further underlines how important the Cisco technology is to our business.” Reusable services within the SONA framework provide comprehensive network security across the infrastructure and also when connecting to other networks.

Using the Cisco technology for the core IP network has enabled Energy Networks to replace a number of leased lines and redeploy money saved to help fund the new Cisco infrastructure and Cisco Unified Communications System. Rutherford says, “Being able to significantly reduce the number of leased lines we use has produced significant OPEX savings and will continue to do so as we extend and build the Cisco infrastructure.”

The Cisco Unified Communications System makes telephony management significantly easier. Rutherford says that the telephone control console in its old system was a ‘key and lamp affair’ with as many as 255 keys which operators would have to use to communicate with substations. “The Cisco technology, on the other hand, gives our staff a much more user-friendly interface with touch screen and simple, more intuitive functions and controls,” says Rutherford. The Cisco network infrastructure also provides a system-wide service which may be extended to support other communications techniques such as video surveillance and conferencing.

The Cisco network itself is very easy to manage and use. Energy Network's old telephony system did not have many management features whereas the Cisco technology enables staff to spot issues before they arise. Also, support issues such as re-provisioning a circuit from one site to another is very simple; all that is needed is to click on the end points and the circuit is automatically provisioned.



**“Because of the strict safety requirements and regulations imposed on network operators, if the Energy Networks does not have secure and well protected communications for a specific transmission power line then it may have to turn the line off. That further underlines how important the Cisco technology is to our business.”**

**Richard Rutherford, Senior Systems Engineer, Energy Networks, Scottish Power**



**Americas Headquarters**

Cisco Systems, Inc.  
 170 West Tasman Drive  
 San Jose, CA 95134-1706  
 USA  
[www.cisco.com](http://www.cisco.com)  
 Tel: 408 526-4000  
 800 553-NETS (6387)  
 Fax: 408 527-0883

**Asia Pacific Headquarters**

Cisco Systems, Inc.  
 168 Robinson Road  
 #28-01 Capital Tower  
 Singapore 068912  
[www.cisco.com](http://www.cisco.com)  
 Tel: +65 6317 7777  
 Fax: +65 6317 7799

**Europe Headquarters**

Cisco Systems International BV  
 Haarlerbergpark  
 Haarlerbergweg 13-19  
 1101 CH Amsterdam  
 The Netherlands  
[www-europe.cisco.com](http://www-europe.cisco.com)  
 Tel: +31 0 800 020 0791  
 Fax: +31 0 20 357 1100

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).

©2006 Cisco Systems, Inc. All rights reserved. CCVP, the Cisco logo, and the Cisco Square Bridge logo are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networking Academy, Network Registrar, Packet, PIX, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0609R)

Printed in the UK

The Print Consultancy ( 01483 771211 ) / February 07