INDUSTRY LEADING VALVE ACTUATION NEWS FROM THE WORLD OF ROTORK | rotork®

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Introducing:

Pakscan P3
a new evolution...

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The latest news from Rotork

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The latest Rotork installed Profibus enabled actuators

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Pakscan upgrade completes valve automation programme for ChevronTexaco

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Rotork is Innovation and Design
Excellence Award Winner

PLUS:
Power Station Feature
UK Power station showcases Rotork's electric modulating actuator options

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INDUSTRY LEADING VALVE ACTUATION NEWS FROM THE WORLD OF ROTORK

COVER: PAKSCAN P3: A NEW EVOLUTION

Two decades ago Rotork launched Pakscan, a revolutionary advancement in actuator and plant equipment control, which quickly became the preferred digital control system for valve actuators in many industries. Now Rotork introduces Pakscan P3, a new evolution of their 2-wire control system..... 10

Front cover main photograph:
Rotork PC Intertechnik EH range in the Czech Republic providing On/Off service and linebreak protection on a natural gas pipeline. In service since 1997.

Gears - American Valve Supplier Awarded to Gears

Rotork Gears Americas was awarded "Distinguished Supplier Award" from American Valve and Hydrant in Beaumont, Texas. We were one of 5 suppliers given this award based on product quality, competitive pricing, problem solving capabilities and on time percentage.

Clay Hightower, General Manager Rotork Gears Americas, receives the award from American Valve and Hydrant.

Fluid System achieves SIL3

Rotork Fluid System is pleased to announce that the CP, GP and GH scotch yoke actuator ranges have received a level SIL3 rating for functional safety. Third-party certified safety data is available on the website: www.rotork.com.

Also available is a document to help customers understand SIL requirements and their impact upon valve actuators and control systems. "SIL Explained", publication F004E is prepared in a simple question and answer format to bring clarity to this often confusing subject.

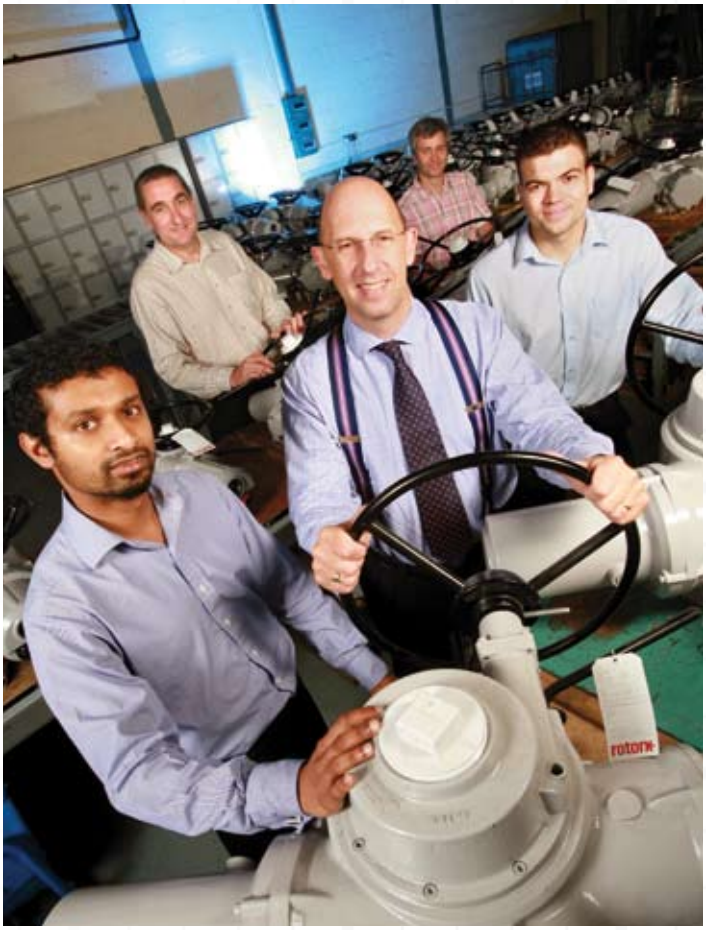
Fluid System scotch yoke, rack & pinion and linear actuators are also certified to be in compliance with PED, ATEX 94/9/CE and IP66M/67M standards.

Rotork is Innovation and Design Excellence **Award Winner**

Rotork is the winner of a prestigious 2006 Innovation and Design Excellence Award, a competition for UK companies who recognise that "creativity and design innovation are the critical elements of continually improving and reinvigorating themselves to stay ahead of the competition".

Rotork achieved joint first place in the Business to Business Product Innovation category, sharing the podium with Cambridge Silicon Radio, a company in the forefront of Bluetooth communication technology. Rotork's entry was led by Research and Development Director Graham Ogden, who observed: "It is a measure of our achievement that as we approach our fiftieth birthday we can still innovate at the same level as a successful young high-tech business working at the edge of technology."

The aim of the awards is to recognise and celebrate the critical role played by both engineering and product design teams.



Rotork's entry was centred on the development of the IQT actuator and was subject to detailed questionnaires and factory visits by an expert panel of judges.

Graham received the award for Rotork at a reception held in London's Hilton Hotel, where he commented:

"This is a tremendous achievement and I would like to thank everyone for making Rotork the innovative company it is today."

The Innovation and Design Excellence Awards are an annual event organised by Cranfield University School of Management and Findlay Publications Ltd, in association with Scientific Generics.

Top: Graham Ogden receiving the trophy for Rotork.
Left: With members of his award-winning engineering team at Rotork Bath

GP200 pneumatic, spring return actuator (model no. GP-200S-685/C2-HPA).

A tight (retro)-fit

Replacing the main steam stop valve at the Northrop Grumman Marine Systems (NGMS) Sunnyvale Plant presented CTi Controltech – Rotork Fluid System distributor in Northern California – with an unusually challenging retrofit project.

The NGMS Sunnyvale plant tests turbines and associated equipment for the US Navy, using large (100,000lb/hr) steam raising boilers to simulate realistic warship conditions. As illustrated by the photograph of the completed installation, space around the valve is severely restricted.

Once the old globe valve and hydraulic actuator had been removed, the new valve package had to be lowered into position through a hole cut out of the roof, using a crane with a 200 foot boom. The new valve, recommended by CTi's George Constas, comprises a Class 1500 metal seated ball valve fitted with a Rotork GP200 pneumatic, spring-return actuator with hydraulic manual override (model no. GP-200S-685/C2-HPA).

Rotork in scheme to boost UK gas supplies

Rotork IQ actuators and Rotork Gears gearboxes are being supplied as part of a major project to increase the supply of gas to UK markets.

The US 7.6 billion Qatargas II project will deliver 15.6 million tonnes annually of liquefied natural gas (LNG) to the UK for 25 years, with the first deliveries expected during the winter of 2007/2008.

The project is a joint venture between state-run Qatar Petroleum and ExxonMobil. Two of the largest LNG liquefaction trains in the world (Trains 4 and 5) will be built along side three existing trains owned by the Qatar Liquefied Gas Company Ltd. At the same time a dedicated receiving terminal is being constructed at Milford Haven in west Wales.

A fleet of sixteen state-of-the-art LNG carriers – each up to 70% larger than conventional LNG ships – is being built to transport the gas to the UK terminal.

Orton has been awarded a multi-million dollar contract encompassing manual and motorised butterfly valve packages for the project. The contract includes bronze manual valves supplied with Rotork Gears gearboxes and motorised valves fitted with Rotork Gears gearboxes and IQ electric actuators. The valve sizes are in the range of 64 to 114 inches.

Mr. Aliani, Orton Managing Director (top) and Mr. Stamdardo, Orton Sales Director (above) inspect the valves and actuators prior to despatch

Egypt – Gas Pipeline

Rotork Fluid System has received an order for GO gas-over-oil actuators to operate 32 inch Perar ball valves on the Benisuaf-Abukorkas project in Egypt.

Saudi Arabia – Petrochemical Plant

Rotork Fluid System is supplying CP and GP pneumatic actuators with control systems for shut-off and ESD (Emergency Shut Down) duties to the Kitz Corporation of Japan for the JCP petrochemical plant project being built in Saudi Arabia by the Japanese engineering company JGC.

The ESD actuators feature a partial stroking capability utilising digital valve controllers. More than four hundred actuators have been ordered, some including K-Mass coating and K-Cab accessories for fire protection.

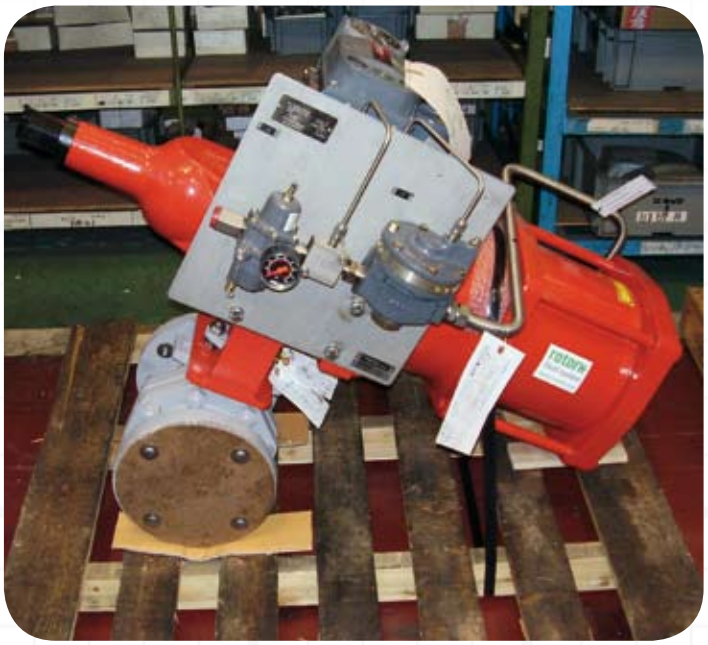
The JCP plant, located at Al Jubail, is owned by Jubail Chevron Phillips Company, a joint venture between the Arabian Chevron Phillips Petrochemical Company and the Saudi Industrial Investment Group. On completion the plant will manufacture chemicals including benzene, ethel benzene, propylene and styrene.

Gulf of Mexico – Oil and Gas Production

This production choke valve is equipped with a Rotork IQM modulating electric actuator for oil and gas wellhead duty in the Gulf of Mexico.

Manufactured in Canada by Master Flo, the valve is amongst the largest of its type produced by the company, weighing over 3,000 lbs and measuring 52.5" x 24". The company specialises in subsea and surface production and injection choke valves and control valves for the oil industry.

The actuator was supplied by Rotork Canada's office in Calgary.



The photo shows a Kitz valve fitted with a Fluid System CP065-250A/B spring return, fail close actuator equipped with filter regulator, gauge, positioner and pneumatic booster.

Kuwait – Crude Oil Gathering

The USD 1.2billion contract for a crude oil gathering centre and gas compression station facilities modernisation project (FMP) has been awarded to Korean company SK Engineering and Construction by the state-owned Kuwait Oil Company.

Rotork Fluid System is supplying actuators to valve companies Econosto in Dubai and KPC Corporation in Korea. KPC's order for nearly 200 GP and CP actuators to operate valves in sizes up to 42 inches was awarded to Rotork's Korean company.

A similar number of actuators have been ordered by Econosto for the project, which will construct a central crude oil gathering centre to replace ten stations currently scattered over south east Kuwait. It will also involve the enlargement of crude oil waste disposal systems and replacing some underground gas pipelines.

Top Right: Rotork Fluid System GP actuator.

Bottom Right: Rotork Fluid System CP actuator.

Valve actuation contract for major new Middle East pipeline network

Rotork has won the contract to supply valve actuators and two-wire digital control systems for the TAKREER Inter-Refineries Pipeline Project, a major new network linking the refineries at Sas-Al -Nakl and Ruwais in the UAE.

The new pipeline system will eliminate the current need to transport products between the two sites by marine tankers, easing shipping congestion in the busy Umm Al Nar Channel, improving environmental protection by removing the risk of pollution and facilitating the construction of an improved infrastructure on Sadiyat Island and the surrounding areas.

Five hundred Rotork actuators will be installed throughout the two parts of the project, involving three 230km pipelines and the expansion of terminal installations at six locations including Abu Dhabi Airport.

Rotork is supplying the latest IQ *Pro* version of its intelligent electric actuator, complete with integral Rotork Pakscan field control units with eight Pakscan hot-standby master stations in three control room cabinets.

The $400 million project specified the use of intelligent motor operated valves connected via multi-dropped, fault tolerant networks in loop configurations to master stations linked to the DCS through redundant serial links. The Rotork Pakscan control system was selected due to its fully redundant, failsafe operation and ability to control up to 240 actuators over a 20km loop on a single two-wire cable.

The new Rotork IQ *Pro* actuator features a larger, user-friendly integral display enabling site engineers to commission the valve and download the complete valve history using an improved, intrinsically safe non-intrusive hand held setting tool. This feature enables the contractor and end user to transport valve data from the field to the office for detailed analysis on a PC running Rotork's free IQ-Insight software, facilitating planned maintenance and minimising the risk of unscheduled shutdowns.

Front end engineering and design for the project has been performed by Engineers India Ltd for the Abu Dhabi Oil Refining Company (TAKREER).

The EPC contractor is Dodsal in the UAE and the project management consultant is Tebodin. The Rotork actuators have been ordered by valvemaker Larsen & Toubro Ltd, India and will be locally supported by Rotork's UAE agent Universal Technical LLC.

Rotork actuators installed on "new era" strategic oil pipeline

A total of nearly five hundred Rotork IQ and IQT intelligent electric valve actuators have been installed on the strategic BTC (Baku–Thilisi–Ceyhan) oil pipeline. This recently commissioned four billion dollar project heralds a "new era" of crude oil supply by linking the oilfields of the Caspian Sea with the Mediterranean coast of Turkey.

The mostly forty-two inch diameter pipeline is one of the longest in the world, stretching 1774 kilometres from Azerbaijan, through Georgia to the Turkish port of Ceyhan. Built by an international consortium led by BP the pipeline is designed to carry up to 50 million tonnes of crude oil a year from the world's third largest reserve to western markets. The project is seen as vital for providing energy security and enhancing regional co-operation.

The majority of the Rotork actuators were supplied for the line valves manufactured by MSA in the Czech Republic. Rotork actuators were also ordered for the project by FMC Technologies in the USA and Consad in the Netherlands. All the actuators are explosion-proof versions of Rotork's latest IQ multi-turn and IQT quarter-turn intelligent range, featuring enhanced "non-intrusive" commissioning, interrogation and diagnostic technologies. Data loggers record historical actuator and valve activity, including valve torque profiles, which can be downloaded and analysed on a PC running Rotork's IQ-Insight software to facilitate predictive maintenance and eliminate unexpected plant failures.

Rotork's contract activities were assisted by Omas Ltd, their agent in Turkey, who co-ordinated activities between MSA and the Turkish pipeline operators, Botas Petroleum Pipeline Corporation. Omas will also provide local service and support for the installed actuators.

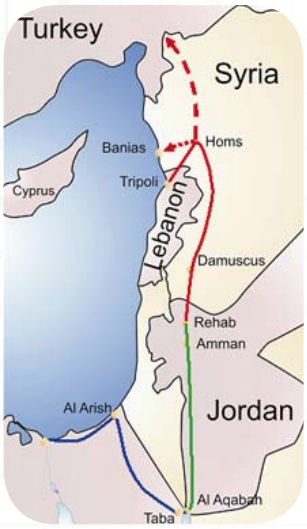
Syrian Pipeline Order

Rotork fluid System GO (Gas-over-Oil) actuators have been ordered for a new Syrian extension to the strategic Arab Gas Pipeline project. The new 36 inch pipeline will stretch 324 kilometres from the Jordan-Syrian border to the Al-Rayan gas compressor near the town of Homs, with a branch to the power plant at Deir Ali.

Rotork's order comprises a total of twenty-one GO actuators, the majority for the operation of 36 inch, Class 600 pipeline ball valves manufactured by Breda Energia S.p.A.. Rotork GO actuators are designed to use the pressure of the pipeline gas itself as the energy provider for swift, reliable valve operation, making them a popular choice for critical pipeline duties, especially in remote locations. Rotork has developed a comprehensive range of control system options, based on many years of pipeline industry experience, to suit both operational and safety applications. During negotiations a product presentation was made to the end user Syrian Gas Company, who appreciated how the 'line-break' and other features of the GO product were well suited to the demands of the application.

The Syrian extension to the Arab Gas Pipeline is being constructed by Moscow-based OAO Stroytransgaz. Eventually the pipeline will extend from Egypt to Turkey and from 2008 will supply up to 4000 million cubic metres per year to Turkey and an additional maximum of 6000 million cubic metres per year for European destinations, the first of which is planned to be Romania.

Phase 1



Phase 2

Pakscan upgrade completes valve automation programme for ChevronTexaco

The installation of a new Rotork Pakscan two-wire digital valve control system at the ChevronTexaco oil terminal in Plymouth sees the completion of a project that has transformed the site from manual to fully automated valve operation.

Winner of the ChevronTexaco Most Admired Terminal Award in 2004, the 5.5 acre Plymouth site stores up to 59 million cubic metres of petrols and distillates which are imported by ship and exported by road tanker, serving Cornwall, Devon and parts of Somerset. Opened originally in 1934, the current tankage was built in 1971 when the site was owned by Shell and BP. ChevronTexaco became part owners during the 1990's and took over the site completely in 2001.

At that time, Rotork 'A' range electric actuators and an early Pakscan control system were installed on the manifold valves that direct the flow of imported fuels to the appropriate storage tanks, but the inlet and outlet valves on all seven of the tanks were manually operated. ChevronTexaco embarked on a programme of modernisation with Rotork's specialist Site Services Department, utilising redundant 'A' range Rotork actuators and valves that had previously been installed at the closed-down Shell West Bromwich terminal. As each tank at Plymouth was taken off-line for routine cleaning, repair and maintenance, actuated valves were installed in series with the existing manually operated valves to enable electrical opening and closing using the actuators' pushbuttons.

At the same time a new centralised control room was built to house the Fanuc 90/70 PLC system and UCOS SCADA package that now supervises the terminal 24 hours a day, 365 days a year import and export activity at the terminal.

To complete the valve automation programme, the tankside actuators have been retrofitted on-site with Rotork Pakscan field cards and linked to a Pakscan master station in the control room. The actuators are linked to the master station on a single two-wire bus loop, providing a very economical wiring solution for data communication, especially in the large areas associated with tank farms. In addition, the loop configuration enables data to be transmitted in both directions, improving system integrity and immediately identifying the position of any fault or break in the network. The original Pakscan system on the manifold valve actuators has also been incorporated into the upgrade, enabling all valve operating sequences for importing and exporting to be centrally monitored and controlled on the upgraded Pakscan highway. The new master station communicates with the Fanuc PLC to enable automatic supervision, indication and logging of valve operations by the SCADA programme. Rotork actuators have also been installed in other areas of the site to perform important safety and environmental protection duties. Rotork Skilmatic electro-hydraulic failsafe actuators have replaced obsolete actuators on ESD (emergency shutdown) valves fitted on the product lines between the tanks and export loading bays. Emergency pushbuttons on each loading bay and at other strategic areas in the plant cause these actuators to immediately close and stop the flow of product in the event of any perceived or potential hazard. A Rotork IQ electric actuator has also been installed on the previously manually operated final outfall interceptor valve. Linked to a hydrocarbon sensor in the final interceptor chamber, the actuator will automatically close the valve if any product is detected in the surface water that drains from the site, protecting the sewer and signalling an alarm to the central control room.

> "...a new centralised control room was built to house the Fanuc 90/70 PLC system and UCOS SCADA package that now supervises the terminal 24 hours a day"...

IQ actuators at Beijing Capital International Airport

Situated in the north east of China's capital city, Beijing Capital International Airport is not only an aviation gateway to the city and a window for international communication but also a radial centre for China's civil aviation network.

"A second expansion project is now underway and once again IQ actuators will be involved."

During a major expansion project during the second half of the 1990's more than 100 Rotork IQ intelligent actuators with a Pakscan digital control system were installed for the centralised control of fuel storage tank filling and emptying. A second expansion project is now underway and once again IQ actuators will be involved. To date, twenty-one actuators have been ordered to operate plug valves in sizes up to 24 inches on new airline oil systems. Currently the airport is used by 55 international and 11 domestic airlines, operating more than 5000 scheduled flights to 88 cities in China and 69 overseas destinations. The latest expansion project will contribute to the important role that the airport will take in the 2008 Beijing Olympic Games.

EH actuators selected for pump control

Rotork EH Range self-contained electro-hydraulic actuators have been selected to operate pump control valves in a waste water handling upgrade project in the US city of St. Louis.

The installation is at the Baumgaartner Lift Station, which conveys waste water from the Baumgartner Interceptor Tunnel to the Lower Meramec River Waste Water Treatment Plant. The EH actuators operate 30 inch ball valves installed on the discharge of two 14 Mg/d 800hp and three 40.5 Mg/d 2000hp vertical centrifugal pumps located approximately 225 feet below ground level.

The EH "intelligent" control module provides the necessary interface between the pump motor control centre and the actuator to sequence the operation of the valves during pump start-up and shut-down operations. The actuator provides surge control with its modulating ability and emergency shut down (ESD) capability with its spring-return, fail closed configuration.

The EH "intelligent" control module provides the necessary interface between the pump motor control centre and the actuator to sequence the operation of the valves during pump start-up and shut-down operations.

Rotork EH 200C – 125/C1 actuator fitted to a GA Industries R-201-D ball valve, awaiting despatch to the Baumgartner Lift Station.

USA – Underground storage

Rotork Fluid System CP, GP and HPG actuators are installed on new plant designed to store gas in underground salt dome caverns. The facility, south of Houston, is being developed by Texas Brine. Kinder Morgan will supply gas to the site for use by the local gas company during periods of peak demand.

USA – Gas gathering

These actuators, photographed at the Puffer-Sweiven factory in Houston, will be installed at the Grass Roots Gas Gathering Facility being built for Enterprise Products at Meeker in Colorado.

Puffer-Sweiven is supplying over sixty ball valves ranging in size from ¾ inch Class 300 to 30 inch Class 900, operated by Rotork R, GP and P Range pneumatic spring return actuators.

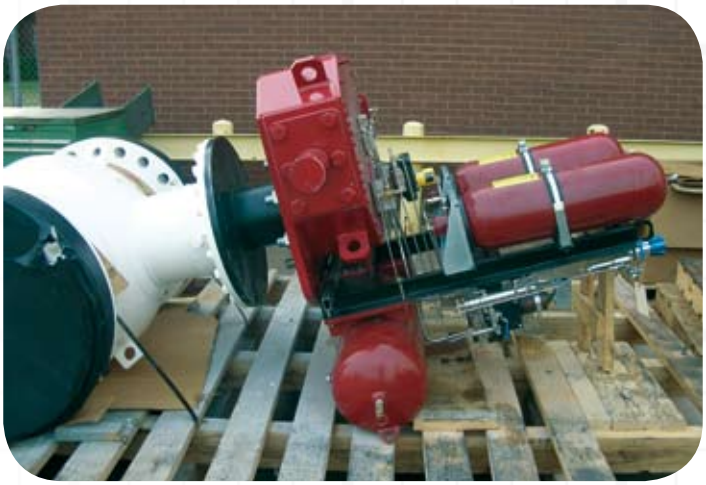
UAE – Onshore gas development

The photo shows one of the linear hydraulic actuators supplied by Rotork Fluid System to Valvitalia for the Adco OGD3 Onshore Gas Development project in the UAE. Thirty-nine of these actuators will operate high pressure (API 100000) valves in 6, 8 and 16 inch sizes.

In addition fifty-seven spring return actuators from the CP and GP range of actuators are being supplied by Rotork Fluid Systems Leeds to Tomoe Valves in the UK for operation of their high performance butterfly valves in sizes 8", 10", 12" 14" 16" 18" 20" and 24" from class 150 through to 600. For the same project Rotork is also supplying more than 500 IQ intelligent electric actuators and Pakscan two-wire digital control systems.

Algeria – Oil production

This photo shows one of five GO (Gas-over-Oil) actuators supplied by Rotork Fluid System in the USA to Cameron for gas compression and re-injection facilities on a Sahara Desert project in Algeria.



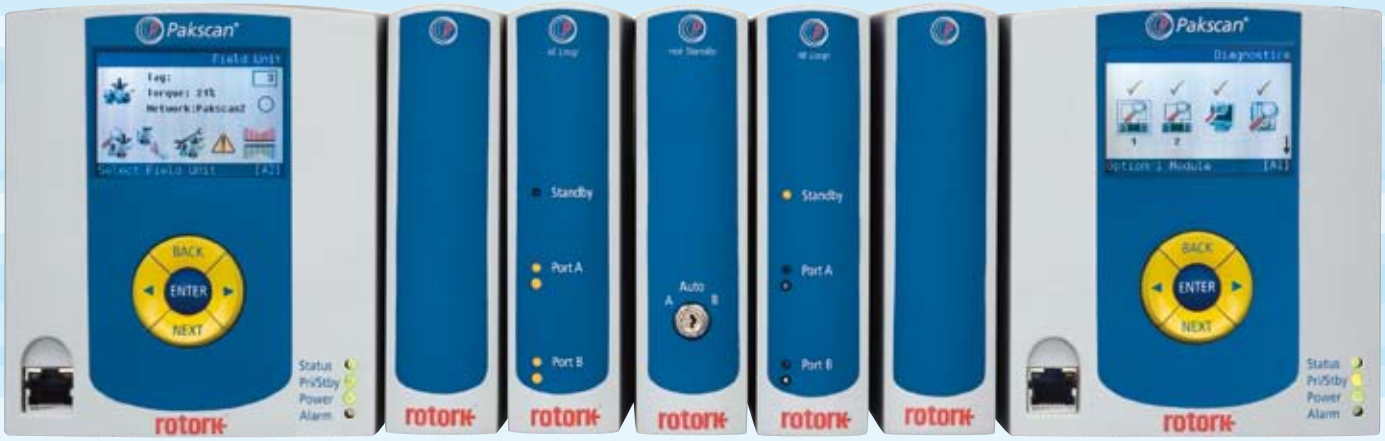
Sonahess, a joint venture between Sonatrach and Amerada Hess, has awarded Bechtel a USD 420 million contract for a project to increase the production of a mature oil field.

Situated about 870 kilometres south east of Algiers the scheme consists of two pipelines, an 88 megawatt gas turbine power plant, compressors, pumps and other facilities.

Left: Rotork Fluid System GO actuator fitted to Cameron 24x20inch ANSI Class 600 ball valve

COVER FEATURE

Pakscan®



Pakscan P3– a new generation of 2-wire digital control

Rotork is proud to introduce Pakscan P3, the third generation of its two-wire digital monitoring and control system for valve actuators and associated plant equipment.

Pakscan P3 inherits all the features of the Pakscan IIE system that it supersedes and adds innovative technological advances born out of customer-driven evolution and refinement. New features combine increased information capacity with improved user-friendliness to achieve an unprecedented potential for asset management.

The new features can be divided into two categories:

1 - Those that increase the performance and flexibility of the system.

2 - Those that make it easier to install and operate.

The first category includes Ethernet connectivity, a built-in secure web server, time synchronisation, data-logging of host messages, field unit commands and status changes and email notification of alarm conditions. In addition, master station host communications have been enhanced to include two serial ports, two Ethernet ports and an Ethernet configuration port. Via Ethernet, up to 10 concurrent hosts can be actively communicating with the master station.

A significant improvement in user-friendliness is achieved by the introduction of intuitive colour icons on the master station HMI screen, replacing the text-only predecessor. These clear, easy to read icons facilitate navigation of the screen menus and the configurations of 'top-level' settings including controls, alarms and diagnostics. Re-programming of individual field control unit parameters can be performed at the master station, or remotely via the host serial or Ethernet link. Further practical improvements include front access to all terminals for installation convenience either on a rack or in a panel.

The user interface of the new P3 master station is configurable for multiple languages as standard. The multi lingual graphical user interface (GUI) mirrors Rotork's industry leading IQ *Pro* range of actuators which are user programmable with language modules downloaded from Rotork's website and uploaded to the actuators via the new Rotork Setting Tool *Pro*.

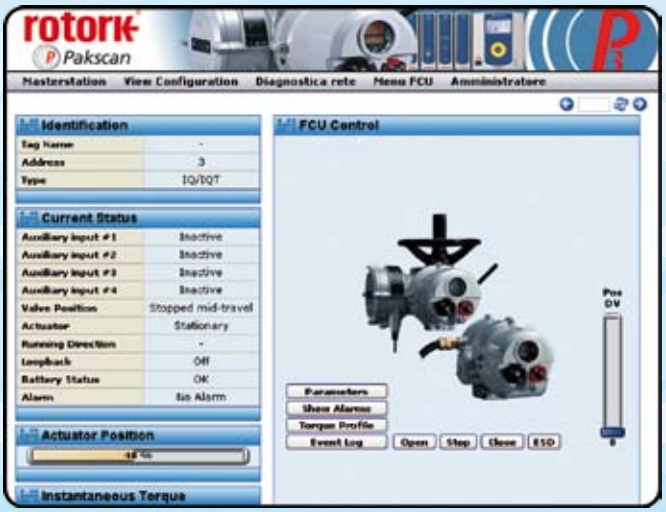
Pakscan P3 is configurable for single channel, dual channel and hot standby operation, and utilising Modbus RTU and TCP protocols the new system can be seamlessly integrated into existing Pakscan installations.

The launch of Pakscan P3 coincides with the twentieth anniversary of Rotork's pioneering launch of the first Pakscan system, which was quickly adopted as the preferred digital control system for valve actuators in many industries, especially in the spacious environments associated with oil and gas industry installations. Pakscan has undergone continuous development throughout it's history and maintains its predominant market position, with nearly 2500 systems sold in the last decade.

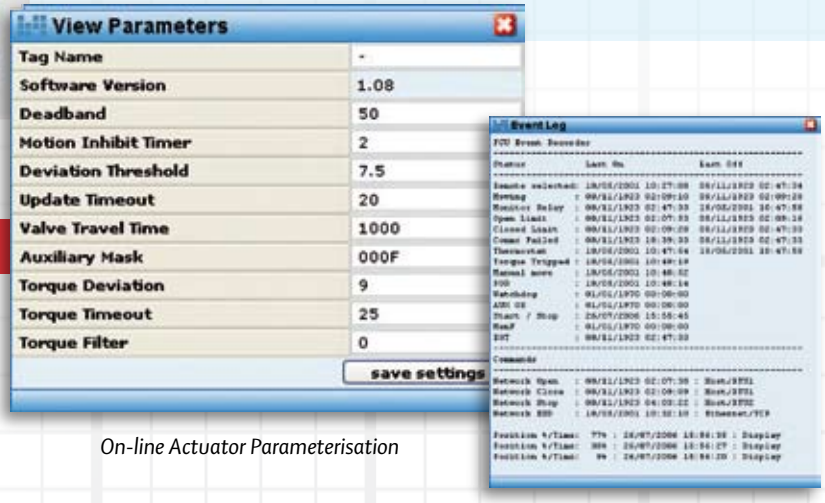
Web Browser Opening Screen

Range P3 Pakscan **Launch Date** Autumn 2006 **Availability** Worldwide

CPU module with colour graphical HMI



Web Browser - MOV Control & Monitoring



On-line Actuator Parameterisation

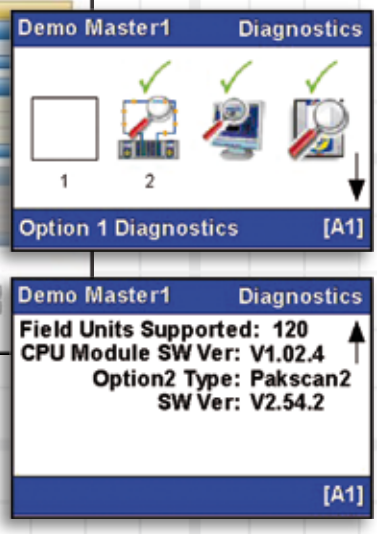
Event Logging

Rotork Pakscan P3 specifications

- Ethernet Connectivity
- Built-in Secure Web Server
- Additional Host Security
- Host Message / Field Unit Logging
- Intuitive Colour Graphical HMI
- E-mail Notification of Alarm Conditions
- Time Synchronisation Capability
- Multiple Language Support
- Front Access to All Terminals
- Multiple Host Port Connectivity
- Database Support for up to 240 Nodes
- Compatible with all Pakscan Equipment
- Full MOV Control and Monitoring
- On-line Actuator Parameterisation
- Status and Alarm Indication
- Event Logging

For detailed information see publication S001E, contact your nearest Rotork representative, or visit www.rotork.com

Multiple Language Support



P3 Diagnostics Screens

Oil spill response retrofit

Rotork Rochester has successfully designed and produced an IQ actuator package to assist in the vital role of marine oil pollution recovery.

The package is being supplied to the Marine Spill Response Corporation (MSRC), an independent, non-profit company in the USA formed as a result of the Oil Pollution Act of 1990. The main mission of the MSRC is to provide a rapid response to oil spills of any size, for which the organisation has a fleet of eighteen vessels. Each vessel can store up to 4,000 barrels of oil and is equipped with an oil-water separation process, which is where Rotork is involved.

In addition to the IQ actuator, Rotork Rochester's Engineering and Service departments also designed stainless steel hardware, adaptation bracketry and couplings to facilitate shipboard retrofitting. To cope with the harsh marine operating environment the actuator and gearbox are coated with special offshore paint, resulting in a durable and successful retrofit package.

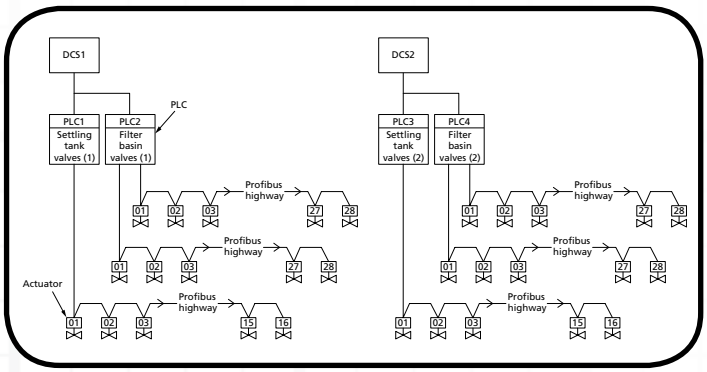
'The main mission of the MSRC is to provide a rapid response to oil spills of any size, for which the organisation has a fleet of eighteen vessels'

Retrofit claims first Profibus waterworks installation in Japan

Rotork Japan can claim the first Profibus controlled actuator installation in the Japanese water industry as a result of a retrofit project at the Isehara waterworks. The project involved the installation of 144 IQ actuators with a Profibus DP fieldbus system under Mitsubishi PLC control.

The IQ actuators are controlled by Mitsubishi SCADA software through four PLC's. Two PLCs control sixteen settling tank valve actuators each on single channels and two control fifty-six filter basin valve actuators each on dual channels of twenty-eight. The majority of the actuators are providing on/off valve control whilst others perform positioning duties.

Isehara waterworks were originally completed in 1979 and treat up to 220,000 tonnes of water per day. Rotork IQ actuators are also installed at the associated Arima waterworks, which is on the same supply network, but Isehara is the first to adopt new Fieldbus technology.



System Configuration Diagram

Profibus Seminars

Rotork Japan has successfully promoted Rotork's Profibus capabilities at dedicated seminars held at Tokyo, Osaka and Kitakyusyu.

A Rotork IQT Profibus actuator was demonstrated, operated by a Toshiba PLC, as part of an exhibit showing how different plant equipment can be combined on the same highway. Amongst other technical subjects, the seminars also demonstrated that Profibus is supported by many PLC manufacturers and available with Ethernet connectivity, a feature which received much audience attention. It was felt that the seminars, organised by the Profibus Associated in Japan, have done much in bringing the technology to the attention of a wider audience of manufacturers and users.

Profibus actuators help to increase the water supply in Essex

Rotork IQT and ROM valve actuators on the filter flow and backwash valves.

Profibus-enabled Rotork electric valve actuators are key components in the state-of-the-art control system for a new filtration and treatment plant at a water source owned by the Essex and Suffolk Water Company. Mowlem Engineering & Mowlem Civil Engineering are building the new plant in order to increase the supply of high quality water to users in the Grays and Thurrock area by up to 4.5 megalitres/day.

The well, pumping station and filter house were originally constructed in 1923 by the former South Essex Waterworks Company and the site is now being brought back into use after four years of redundancy. An electric pump has been installed to bring the water to the surface where it is treated and filtered to remove a high iron and manganese content before entering the supply network. The new plant comprises six pressure filters containing sand and manganese dioxide media, multiple chemical dosing stations and on-site filter backwash water processing, all under PLC automatic control using Profibus communication highways.

The majority of the Rotork actuators installed are IQT units on butterfly valves controlling the flow through the filters and the sequence of backwashing operations, which is initiated either by time elapsed, operator intervention or the analogue input signal from a differential pressure sensor. The backwash sequence utilises the digital inputs and outputs and the analogue input available on the Rotork Profibus card to minimise the number of separate Profibus interfaces required and to simplify site wiring. On receipt of the backwash signal the IQT actuators are programmed to close the filter inlet and outlet valves and open the backwash valves that enable water stored on-site to be gravity fed through the filters. At the same time digital outputs from the Rotork Profibus cards operate smaller Rotork ROM2 electric actuators on adjacent air scour valves to aerate the filter media during backwashing. At the end of the backwash period the valve operating sequence is reversed to put the filter back into normal operating mode.

The same Profibus highway controls the actuators and monitors the instrumentation on the backwash water treatment plant, which comprises a settling tank from where the separated water is drained into a wildlife lagoon in regenerated environmental land next to the site. The Profibus highway is SCADA supervised by a Siemens SL5 PLC at Essex and Suffolk's headquarters, with an Allen Bradley 50/4 PLC in the site's new control room. Under normal unmanned operation, data from the PLC will be communicated by telemetry link to the Essex and Suffolk Water central control room, at Hannifield Reservoir, where remote monitoring, interrogation and control can be performed.

Mowlem Project Leader Paul Tompkins explained the benefits provided by adopting the Profibus solution: "The site PLC required the use of a Profibus card for the variable speed pump control, so electrical contractors were asked to submit tenders for conventional hard wiring and the Profibus alternative for all parts of the site.

The adoption of Profibus facilitated substantial savings with electrical installation costs. Pre-commissioning and wiring checks were simplified and commissioning procedures were less arduous. The cost of the Rotork Profibus actuators was comparable with the 'Folomatic' current position transmitter alternative although the functionality of the Profibus version is greater.

Further installation time and material savings were experienced by using the spare I/O capability available within adjacent actuators to transmit flow, pressure, level and digital status signals back to the PLC for control and supervision of the plant.

To summarise, site cost reductions of up to 50% were achieved through reduced cabling and cable management requirements, fewer cable glands, less design drawing, reduced installation time, less terminals and termination accessories, reduced Profibus interfaces thanks to the Rotork actuators, reduced PLC I/O cards and a smaller motor control centre ICA section."

UK Power station showcases Rotork's electric modulating actuator options

Recent contracts at the RWE npower Littlebrook Power Station in East London have led to the introduction of Rotork electric actuator solutions in all areas of the station's modulating valve and damper plant. The Rotork actuators are being installed as an economical and reliable replacement for traditional hydraulic equipment and power packs which demand regular maintenance and continuous electrical power.

The contracts have been awarded to Exeeco, a specialist actuation, projects and service company within the Rotork Group. Exeeco's comprehensive experience of power station modernisation projects enabled the company to propose an upgrade package encompassing the complete range of Rotork's electric modulating duty actuators.

The first application involved the introduction of Rotork Jordan SM6000 lever arm actuators for fully modulating damper vane control in the high ambient temperature environment of the boiler gas recirculating plant. Following this, Exeeco proposed Rotork Skilmatic electro-hydraulic linear actuators for the high thrust, high speed and accurate operation of boiler feed regulating, combustion control and spill valves. The Skilmatic actuators have been specially customised to provide the double-acting control demanded by these duties.

Finally, modulating versions of Rotork's market leading IQ intelligent electric actuators are being installed for the operation of gas/air heater bypass dampers, forced draft discharge dampers and induced draft fan discharge dampers.

First commissioned in 1981, Littlebrook is currently called upon to 'top up' the National Grid with up to 1370 Megawatts of power at times of peak demand. For this reason it is essential that the oil-fired generating plant responds to National Grid demands with speed and flexibility.

Exeeco sales director Ian Elliott explains: "These contracts were won against fierce competition from European actuator manufacturers. Our ability to offer several different specialised products and to design modified product solutions for specific customer applications highlights the service that Rotork offers for economic and accurate high modulation control using electric actuators."

Above: A Rotork IQM intelligent electric modulating actuator in the company's R & D laboratory.

Above: Customised Rotork Skilmatic linear double-acting actuators undergoing final factory inspection, utilising "non-intrusive" programming technology.

Left: One of the Rotork Jordan SM6000 actuator installations at Littlebrook Power Station.

Rotork introduces "bumpless" Profibus Highway Termination Module

Rotork was pleased to co-sponsor this year's UK Profibus Users Conference, held at Coombe Abbey, near Coventry. This prestigious event, attended by some of Europe's leading Profibus vendors and users, provided the ideal showcase for introducing Rotork's latest addition to its Profibus catalogue, the Highway Termination Module.

Housed in the actuator's terminal cover, the module provides an easy means of connection to Profibus highways, with switchable termination resistors and a "bumpless" isolation mechanism to enable actuator connection/disconnection from the highway without disrupting communications to the other highway devices. It can also be used to provide a cost effective substitution for highway isolator boxes and junction boxes.

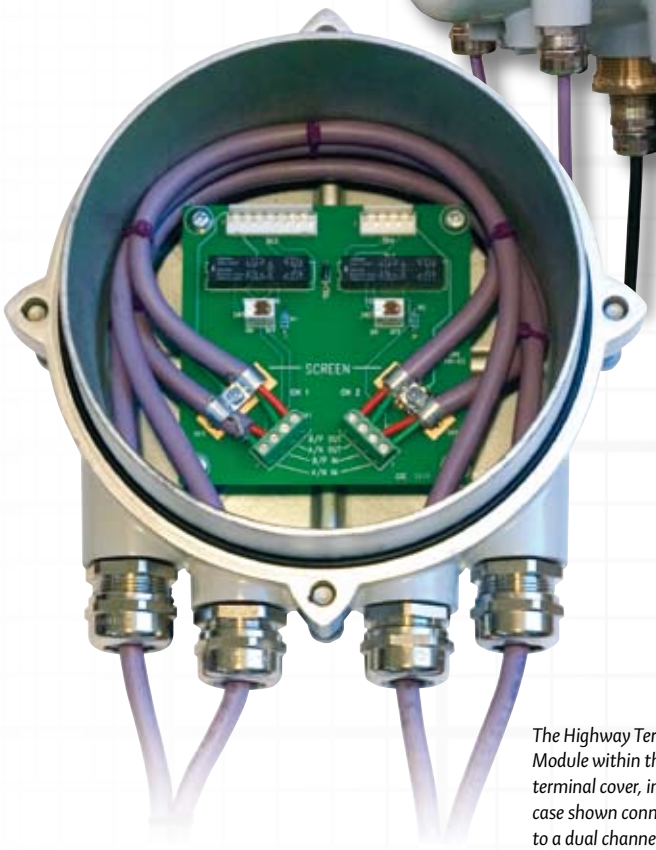
The module itself has been specifically engineered to enable connection of both stranded and solid core Profibus highway cables and has four conduit entries to allow both single and dual channel highways to be interfaced to the actuator. The module also maintains Rotork's philosophy of a zero internal stub length, essential for high baud rate applications, by having separate "IN" and "OUT" cabling from the field, via the module, all the way to the Profibus card within the actuator. As expected with Rotork products, the new module doesn't compromise the superior IP68 environmental rating and is available for the entire IQ intelligent actuator product range.

Rotork's prime location within the exhibition area proved to be the ideal spot for highlighting not only the Termination Module but also Rotork's Profibus DP-V1 card capabilities.

Rotork demonstrated its Profibus acyclic communications capability using both a Mitsubishi PLC DP V1 master and a standard laptop running an FDT application. Rotork showed how easily diagnostic and maintenance data could be accessed alongside normal slave cyclic communications. Multiple parameters such as valve torque profiles, number of starts, deadband settings etc., are available for access by any V1 master. The DP-V1 capability is included as part of Rotork's standard Profibus card and the DTM and EDD files, needed for V1 communications, are free to download from Rotork's website.

Rotork IQ valve actuator equipped with the Profibus Highway Terminal Module, housed within the actuator terminal cover (above).

Note the separate "IN" and "OUT" cable entries for the Profibus highway.



The Highway Terminal Module within the terminal cover, in this case shown connected to a dual channel Profibus highway.

Rotork powers on in China

In recent years, over forty power plant projects in China have provided orders for over six thousand Rotork electric actuators, reports Eric Li, General Manager for Rotork China and Hong Kong. IQ and IQT actuators account for four out of five actuators ordered, providing further evidence of the design's market leading international predominance.

One of the largest projects has been at Zhenjiang where more than one thousand actuators are installed. Recently, thanks to increased sales activity in the Rotork Beijing office, business in the north of China has also increased, with projects including Neimeng and Shanxi. Further sales have resulted from the introduction of flue gas desulphurisation measures for environmental improvement. For example, several hundred actuators have been supplied in recent months for the operation of dampers in these schemes.

The introduction of the AWT actuator has also helped in those areas of the market which are becoming increasingly competitive, bringing in new business when the sophisticated features of the IQ are not required.

Rotork Australia in spillway upgrade at Lauriston Reservoir

Rotork Australia has completed a comprehensive 'turnkey' actuation retrofit project to improve flood capacity at a water supply reservoir in central Victoria. Rotork's contract involved the replacement of worn out gearboxes and braking mechanisms on ten spillway gates at Lauriston Reservoir with IQ actuators and Rotork Gears gearboxes.

Owned by Coliban Water, Lauriston Reservoir has a capacity of 20,000 ML is one of three major storages along the Coliban River supplying water to 130,000 domestic and business customers. The spillway structure was completed in 1941 and several years later the spillway gates and operating mechanisms were installed to enable the controlled release of water during a flood.

The ten gates vary in width from 6.71 to 8.23 metres. Each gate is 2.76 metres high and weighs over 5 tonnes. Before the upgrade each gate was operated by a 1.7 tonne gearbox, requiring 14800 turns to fully stroke the gate. The gates are wound down to close, originally by hand and later with a portable hydraulic drive. The gates are counterweighted to open so the gearboxes acted only as braking units in this direction.

Maintenance inspections revealed that the gearboxes were in poor condition with worn gears and braking mechanisms. The overhaul costs would be very high.

At the same time a risk assessment carried out on the operation of the gates concluded that, in addition to Occupational Health and Safety risks, the gates could not be opened quickly enough to achieve maximum flood capacity and therefore the spillway capacity of the reservoir itself was reduced. A faster, more reliable and less physically demanding solution was required.

Rotork Australia offered IQ25, 24 rpm actuators fitted to Rotork Gears MTW8 (120:1 ratio) gearboxes, with new mounting frames designed to utilise the original gearbox fixing points, eliminating the need for any structural modification.

As part of the 'turnkey' project the actuators were fitted with vandal resistant covers. Actuator installation was completed on schedule and commissioning was performed using a Pocket PC with Rotork Pocket Insight software. A Pocket Insight equipped PC was also used to download the actuators' data logger files for torque monitoring following test operations.

Coliban Water's Headwork's Manager Bruce Duncan commented on the project: "Rotork's actuators not only exceeded the lifting capacity and gate operational speed specified by the project but also provided an industry proven product, well supported through a regional office."

Gearboxes also contribute to environmental improvement

In contrast to the industries and utilities which comprise the end-user locations for the majority of Rotork products, others can be found in remote and rural areas, helping to preserve environments that are beautiful and fragile.

One such installation is pictured here, where a new outfall sluice has been built by the UK Environment Agency on the coast of north Norfolk in a scheme to maintain and improve the ecology of salt marshes and reed beds. The area is an important breeding ground and sanctuary for rare birds including the marsh harrier and bittern.

The Rotork Gears manual gearboxes operate the sluice gates, which form part of a comprehensive scheme designed to improve flood protection and maintain river levels in this coastal area. Salt water flooding of the reed beds can cause disruption to the food chain which is a threat to the rare birdlife. The whole coastline, which is designated a Special Area of Conservation, Special Protection Area and Site of Special Scientific Interest, is especially vulnerable to high tides and rising sea levels, adding increased urgency to the completion of schemes such as this. In addition to its importance a bird sanctuary, the region is a well known recreational area for bird watchers and tourists, featuring spectacular sandy beaches and even seal colonies.

Rotork actuators increase the Profibus benefits for Yorkshire Water

The introduction of Profibus-enabled Rotork IQT valve actuators on a filter bed automation upgrade for Yorkshire Water has facilitated the installation of a highly economical and efficient control network.

Stuart Goodwill, M & E Engineer at Mott McDonald Bentley – the partnership design and construction company for the project – explains: "Rotork's Profibus card enabled us to fully exploit the features of Profibus control technology when configuring the design of the network. Employing the analogue input fitted as standard on the Rotork card has saved the expense of either installing a separate Profibus interface on all thirty-five flowmeters or hard wiring them to the PLC. Instead, the analogue signal from each flowmeter is simply linked to the corresponding actuator for onward communication with the PLC via the Profibus network."

The automation programme is at Esholt, one of Yorkshire Water's largest waste water treatment works, serving more than 300,000 homes and industry in the Bradford area.

The Rotork IQT actuators are fitted to previously hand operated plug valves on the secondary treatment percolating filter beds. Constructed over fifty years ago, the filter plant consists of seventy axial beds and extends over a distance of more than a mile. Effluent arrives from the distribution chamber, where it is mixed with re-introduced final effluent to improve consistency before being gravity fed into thirty-five troughs, each serving a unit of two filter beds. The automation upgrade is designed to improve the flow performance into the beds, optimise filtration efficiency and prevent damaging problems such as dry bedding and uneven flow distribution that were difficult to avoid when the plant was manually operated.

Electromagnetic flowmeters have been fitted in the pipes serving each trough, adjacent to the Rotork actuated plug valves. The flowmeters and actuators are connected to a new PLC in what is believed to be Yorkshire Water's first use of a Profibus network on a waste water treatment plant.

> "Rotork's Profibus card enabled us to fully exploit the features of Profibus control technology when configuring the design of the network"...

Due to the sheer size of the filter bed site, the PLC is centrally housed and four separate control buses are used to prevent a reduction in the data transmission rate and eliminate the requirement for repeaters in the network.

The total rate of flow into the plant is divided by thirty-five and this figure (typically 80 litres/second) is compared by the PLC to the reading from each flowmeter. If the flowmeter reading is too low or too high the PLC instructs the appropriate Rotork actuator to step the position of the valve in either opening or closing direction until the flow reading is within the operating deadband. The PLC software, written by Blackburn Starling, also enables the automatic operation of individual filter sets to be overridden if circumstances dictate. For example, the inverter drive controls the speed of the spray bars across the filter beds can be slowed down to enable the bed to be flushed, improving subsequent filtration performance.

The Rotork actuators also communicate valve position data to the PLC whilst integral data loggers store operating data including valve movements and torque profiles. All the operating and flow data from the PLC is transmitted via a radio modem to the Esholt central SCADA control room where the operation of the entire site is displayed.

The filter bed upgrade was commissioned in 2005, since when it has successfully improved the treatment of up to 250,000m3 of effluent a day, helping the site to achieve stringent Environment Agency consent targets.

Above: Stuart Goodwill from Mott McDonald Bentley is pictured with one of the Rotork IQT actuators at Esholt.

Right: Inlet installation showing the flowmeter in the foreground, the signal from which is linked to the Rotork actuator via the local control and indication panel mounted on the wall.

Skilmatic is the answer for remote failsafe valve operation in Brazil

Rotork Skilmatic electro-hydraulic actuators have been specified to provide reliable and economical emergency shut-down (ESD) duties on remotely sited valve installations at a chemical plant in Brazil.

Dow Chemical operates the chlorine-soda plant in the state of Bahia, using brine as a raw material to produce chlorine and soda through an electro-lytic separation process. The plant is served by several brine wells that are spread apart in remote locations and require reliable failsafe valve operation. Each well comprises three automated valves. One is for water injection to dissolve the rock salt, one is for oil injection to make the well top impermeable and prevent its collapse and the third is to control well production. In the event of an accident or power loss all the valves must failsafe to the closed position, isolating the well whilst maintaining pressurisation. Due to the remoteness of the locations, Dow decided that the use of conventional pneumatic equipment would have been too expensive because of the operational and maintenance costs.

Rotork's representative in Brazil, Fluxo Servicios de Petroleo, was therefore able to offer the Skilmatic solution, providing the simplicity of electrical operation combined with the precision of hydraulic performance for the ESD failsafe duty. Actuators selected for the application are Skilmatic SI -1 and SI -2 units, which also incorporate Rotork's innovative IQ control intelligence and non-intrusive commissioning and data communication technologies. The double-sealed electrical enclosure is certified to IP68 (NEMA6) watertight standards, providing permanent protection from the environmental challenges of the Brazilian climate.

This application is among the first where the Skilmatic actuator has been proposed for a Dow Chemical plant, giving Rotork the opportunity to include the design in its existing contract to supply electric actuators to Dow's worldwide sites and projects.

"This application is among the first where the Skilmatic actuator has been proposed for a Dow Chemical plant."

One of the Rotork Skilmatic SI-2 actuators operating a butterfly valve on a brine well for Dow Chemical in Bahia.

Tomoe Trusts RFS

When The Tomoe Valve Company in Japan decided to enter the highly competitive desalination market they focussed on two initial objectives. Firstly, the winning of a major project contract and secondly, the selection of a reliable valve actuation manufacturer for the arduous operating and environmental conditions that are prevalent in the industry.

Their contract activity targeted the Saudi Electric Company Shuaibah Project Phase 3, which will build a 194MIGD desalination plant with a daily capacity of 880,000 tonnes together with three 917MW thermal power plants on a site approximately 110km south of Jeddah. Constructed by Korean contractor Doosan, the completed project will supply desalinated water and electricity to the holy Islam cities of Mecca and Medina.

For valve actuators they selected Rotork Fluid System. Led by Stuart Jenkins – Sales Manager Japan and Korea – the meticulous process of meeting the constantly developing demands of the bid process began immediately. It was truly a team effort, with Roberto Marcalli at Lucca working closely with designers and contract engineers at Tomoe, supported locally by Rotork Japan. Twelve quotation revisions were eventually completed, sometimes within only hours of the receipt of new sizing parameters.

The successful outcome was a landmark contract for Tomoe and an order valued in excess of one million Euros for Rotork Fluid System. Rotork is supplying 139 packaged CP and GP pneumatic actuators for the operation of Tomoe butterfly valves in sizes between 12 and 150 inches. The delivery schedule is as demanding as the bid process, but Fluid System is confident that the equipment will be delivered on-spec and on-time, leading to repeat orders for both parties.

Pictured with two of the actuators, Mr.Toru Aoki from Tomoe and Rotork's Stuart Jenkins mark the successful outcome of their efforts and the award of the landmark contract.

A Rotork Fluid System GP actuator.

Did you know that *Increased Safety (Exde)* is no safer than *Flameproof (Exd)*?

There is often confusion in understanding the difference between "Exd" and "Exde" hazardous area enclosures for actuators. This has previously led to incorrect specification and in some cases incorrect supply. Using an actual question, this Q&A article explains the differences between the two standards.

In addition, Rotork has produced a comprehensive publication dedicated to the subject of enclosures for electric actuators. "Actuator Enclosures Explained" - G007E provides detail on hazardous and non-hazardous area enclosure standards and is designed to help help users, specifiers and others in the supply chain understand the options and make the correct choices. G007E is available to download from our website www.rotork.com.

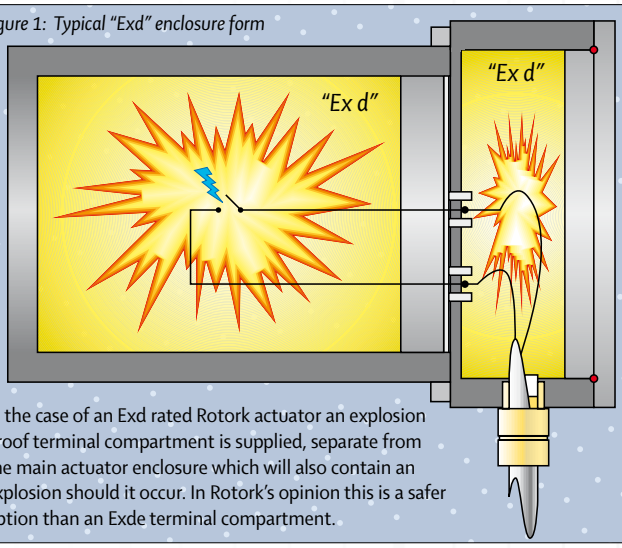
Q: For a refinery upgrade project, the German contractor has specified "Exde" approved actuator enclosures for Zone 1 hazardous areas. Is "Exde" safer than "Exd"?

A: No, correctly called "*Flameproof - increased safety*", Exde does not mean that the enclosure has an "increased" or "safer" protection level than flameproof "d". Increased safety "e" refers to another concept of protection for Zone 1 hazardous areas that, for electric actuators, can only be applied to the terminal compartment. Additional *increased safety* measures are made in its design to achieve the same "safe use" level as the flameproof part of the enclosure. This is a reflection of the inherently higher risk design concept applied by type "e". To understand the differences between Exd and Exde, an examination of each type must be made.

Flameproof - "Exd"

All electric actuators include components such as switches that can produce sparks in normal operation. The construction standards assume the explosive gas mixture on the outside will also be present on the inside of the enclosure and therefore an internal explosion *will occur*. A flameproof enclosure must be strong enough to withstand the explosive pressures inside the enclosure and must not "transmit the explosion to the explosive atmosphere surrounding the enclosure". This requires all enclosure joints, covers and cable entries being of a minimum length and with the gap between enclosure components closely controlled. The principle applied is that hot expanding gasses, resulting from the explosion, are "squeezed" through the gap or 'flamepath' and cooled before reaching the surrounding atmosphere. For Exd certified enclosure this concept is applied to the complete actuator enclosure, figure 1.

figure 1: Typical "Exd" enclosure form

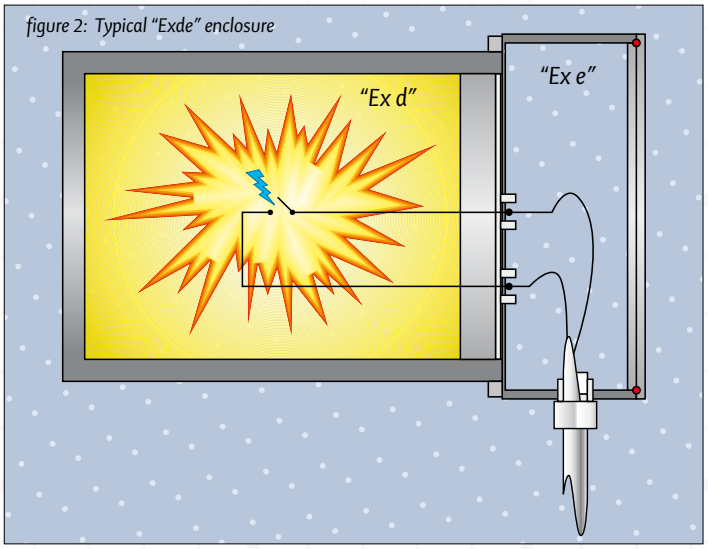


In the case of an Exd rated Rotork actuator an explosion proof terminal compartment is supplied, separate from the main actuator enclosure which will also contain an explosion should it occur. In Rotork's opinion this is a safer option than an Exde terminal compartment.

Flameproof - increased safety "Exde"

As the actuator terminal arrangements for power, control and indication cables "do not normally produce excessive temperatures or sparks in normal service" they may be located in a segregated "Exe" compartment providing "increased safety measures" are applied in the design to further reduce the possibility of sparks or hot spots occurring. Design features to prevent terminal self-loosening and to increase terminal separation etc must therefore be applied. The Exe terminal compartment need only meet a rating of IP54 to prevent water ingress leading to electrical fault and sparking. It does not have to withstand pressure nor safely release hot gasses associated with an internal explosion as "increased safety" protection is based on the premise that an explosion cannot occur if a spark cannot occur. Therefore "*Flameproof - increased safety Exde*" arrangement combines a "d" type enclosure with an "e" type, the "d" coming before the "e" because the flameproof part of the enclosure is the major part, figure 2.

figure 2: Typical "Exde" enclosure



"Safe use"

Providing standards for cabling etc are rigorously followed, there is no inherent difference in the ability of Exd or Exde enclosures ensuring "safe use". It is true that Exde type of protection demands more control during the installation and maintenance processes and is therefore regarded by some as higher risk as it places more responsibility on third parties to achieve "safe use" through life.

In addition to covers being fitted and correctly certified cable glands being used (which applies equally to Exd and Exde), additional factors such as correct cable selection, electrical circuit protection and most importantly, correct termination method and security must be performed to ensure "safe use" for Exde. It is clear that a loose terminal connecting the 3-phase power or 24V DC control to the actuator could cause sparking and therefore control measures must ensure this does not happen.

Increased safety as a concept of protection is not recognised in the US and Canada where the "class" and "division" approach requires "explosionproof" design (same concept as Exd). Originally a German DIN standard, Exe was adopted into harmonised European standards and later into IEC standards. With this history, Exde is really only specified where there is German influence and the concept remains familiar.

Rotork Fluid System

Managing Director of Rotork Fluid System joins Board of Rotork p.l.c.

Peter France

Rotork p.l.c. Executive Director

Peter France has been appointed to the board of Rotork p.l.c. as an Executive Director. Peter France, is Managing Director of Rotork Fluid System and has been a member of Rotork's Executive Management Board since 2001.

Peter was born in Rotork's home city of Bath and joined the sales department of the electric actuator division in 1989. He then moved to Leeds as the company's sales engineer for Northern England. His career continued as an international area sales engineer, after which he was appointed General Manager at Rotork Singapore, responsible for sales and service activities throughout south east Asia.

Since 2001, as Managing Director of Rotork Fluid System, Peter has shaped the increased sales of pneumatic and hydraulic actuators through the introduction of new products, the enlargement of the international sales network and increased manufacturing capacity. These products, used mainly in the onshore and offshore oil and gas production, petrochemical, chemical processing and pipeline industries, now account for a significant proportion of Rotork's worldwide sales and are central to the company's plans for future growth.

The 103,000 ft² Rotork Fluid System Manufacturing Facility in Lucca, Italy, opened in 2003.

The CP and GO actuators, two of the many Fluid System products introduced since 2001.

Rotork

New Rotork Director will develop site service and retrofit activities

Grant Wood

Service, Projects and Retrofit Director

Rotork welcomes Grant Wood as Service, Projects and Retrofit Director. This new position has been created to focus on the aftermarket service opportunities presented by a rapidly developing marketplace.

Grant explains: "Companies including those in the oil, gas and utilities industries are increasingly concentrating on their core business and sub-contracting aspects such as the care of their plant and equipment to specialists in these fields.

"As a world leading manufacturer of industrial valve actuators, Rotork already has unrivalled experience of the maintenance, management and upgrading of installed actuation assets. My function is to further develop our services in these areas to ensure that we can fully support and satisfy the increasing demands from our customers on a global basis."

Grant's career experience has equipped him well for this task. Leaving Imperial College London with an engineering degree he joined Midlands Electricity, becoming Head of Operations for the Severn Region. Having gained a scholarship from the Royal Academy of Engineering and Sainsbury Management Fellows, Grant left Midlands Electricity to study for a Masters in Business and Administration at the European School of Management in Paris.

Since 1997 he has worked as a management consultant at Coopers and Lybrand, PWC and IBM, focussing on the utility, financial and energy sectors with companies including Scottish Power, London Electricity, Thames Water, Shell and Chevron.

Rotork

New sales engineer for south east England and Southern Ireland

Gordon Croucher

Sales Engineer

Gordon Croucher is Rotork's new area sales engineer for south east England and Southern Ireland. A native of Rotork's home city of Bath, Gordon originally joined Rotork as an apprentice in 1997 and since achieving a B.Eng in mechanical engineering has worked in the Sales Support and Inside Sales Departments.

In his new position he will look after an area which is important to Rotork, particularly in regard to engineering contractors and the water industry.

For more information on ROTALK articles and features contact Nicky Harrington at ROTORK Bath: +44(0)1225 733200 email: nichola.harrington@rotork.co.uk

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