

# Using Actuators to Reduce Emissions

LCPD directives for 2008 and 2012

**rotork**<sup>®</sup>

and



a Rotork Group company

"This retrofit equates to over 50% reduction in NOx emissions"

Doug Gauld of GE Energy  
Main Contractor, West Burton Power Station

## Fulfilling Emission Directives for Large Combustion Plants

**Actuation provides a critical role in the control of all your plant processes, and in the 45 years since it was founded Rotork has become the name for excellence in actuation products for the oil, gas, power, water and waste treatment industries - worldwide.**

We have the experience, know-how and product range to deliver efficient and precise plant, valve and damper actuation to your industry.

Our solution experts have been working with companies around the world to meet and exceed the emissions directives laid down in the Kyoto protocol and the Large Combustion Plant Directive (LCPD) for 2008 and 2012.

### Case Study 1 — Ratcliffe Power Station

ALSTOM has completed the installation of its Boosted Over Fire Air (BOFA) NOx reduction technology on Unit 1 at Ratcliffe Power Station and will complete work on the remaining 3 units. They have utilised Rotork IQT and IQTM actuators for damper operation on the new BOFA ducting.

This scheme also requires new BOFA Fans of which the Fan Vane control is critical to the success of the BOFA system. Rotork - Jordan SM6000 actuators were selected due to their high speed, continuous modulating duty and precise positioning to 0.1% of span.

NOx emission reductions have now been achieved in excess of that demanded by the LCPD.



*IQT actuator installations at Ratcliffe power station*



The World Leaders in Actuation Technology

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## Benefits of Rotork Solutions

Rotork's knowledge of large combustion plant processes enables our solutions to give you the following benefits:

- Improved Boiler Draft Control
- High Speed continuous modulation of ID/FD Fan and Inlet Guide Vanes
- Improved modulation and control of Secondary Air Dampers
- Improved automation and burner management
- Simple commissioning and diagnostics
- Quick response to plant demand
- Improved reliability in high temperature environments
- Efficient fuel control
- Low running costs
- Replacement of redundant and costly hydraulic systems
- Improved emission control
- Precise damper and burner positioning



Actuators play a critical role in achieving Emission Reduction as they are the final element controlling Air and Fuel Supply



## Case Study 2 — West Burton Power Station

Rotork-Jordan electric linear actuators have been selected for the operation of specialised dampers at the centre of an environmental upgrade project at the EdF West Burton power station in Nottinghamshire. West Burton is now reducing its NOx emissions ahead of the LCPD 2008 legislation.

This is achieved by installing Separated Over Fire Air (SOFA) systems and also improving Boiler Draft control by replacing existing on/off actuators on the Secondary Air Dampers with Modulating Duty Electric Actuators. Rotork - Jordan LA2000 electric linear actuators were selected on these particularly harsh applications. The actuators are controlled by a 4-20mA signal fed to a remotely mounted Digital Amplifier, which enables the actuator to operate in Ambient Temperatures upto 107°C (225°F). This combined with modulating duty and precise positioning makes the LA2000 the ideal, low maintenance solution for these applications. Post retrofit tests show over 50% reduction in NOx emissions.



Above - Over Fire Air Damper and Tilt

Right - Secondary Air Dampers



The World Leaders in Actuation Technology

Continuing increase in Market Share has given us greater customer insight, assisting us to develop new and more efficient control solutions

## Rotork Services

Complying with LCPD involves changing existing control systems and enhancing the reliability, control accuracy and maintainability of actuators and final control elements. Rotork can provide all the services needed to make this happen for your plant.

Rotork and its actuation and maintenance specialist subsidiaries can provide help and guidance in the right actuation selection for your processes. We can advise whether a retrofit or new installation is best suited to each section of your plant.

Our reputation for professional and efficient products extends to our service engineers who will work with you in advance to plan and minimise your plant down time while the installation takes place.

The established worldwide network of Rotork offices and centres of excellence ensures that backup and support are always available and close to your location.



"We already had high confidence in the Rotork product range and the services of Exeeco, and we quickly realised that the quality of the Rotork-Jordan company was consistent with our expectations."

Nick Parker, Drax Project Manager



### Case Study 3 — Drax Power Station

The 4000MW Drax Power Station has completed the next part of its environmental upgrade programme. Having already retrofitted Boosted Over Fire Air (BOFA), Drax also needed to improve Boiler Control in advance of the LCPD legislation that comes into force in 2008.

To achieve Improved Boiler Control Drax identified the need to improve the operation of the Superheater / Reheater Main and Bypass Dampers as well as the Secondary Air Dampers. The existing Hydraulic System had become costly to repair and maintain so Drax selected Rotork - Jordan SM6000 actuators as replacements. These actuators offer continuous modulating duty with positioning accuracy to 0.1% of span in ambient temperatures upto 107°C (225°F). The latest supply now sees Drax using in excess of 1000 Rotork Actuators from its IQ, IQT and Jordan ranges.

*Photos showing Superheater / Reheater Bypass Dampers before and after retrofit*





## Rotork IQ (M)

- Multi-turn
- On/Off and Modulating duty up to 1200 starts per hour
- Double sealed IP68 enclosure
- Non-intrusive setting
- Diagnostic Capabilities



## Rotork IQT (M)

- Quarter-turn
- On/Off and Modulating duty up to 1200 starts per hour
- Double sealed IP68 enclosure
- Non-intrusive setting
- Diagnostic Capabilities



## Rotork Skilmatic SI

- Quarter-turn and Linear
- Electro-hydraulic / Electric failsafe
- Continuous modulating duty
- Double sealed IP68 enclosure
- Accuracy to 0.25%
- Non-intrusive setting
- Diagnostic capabilities



## Jordan SM6000

- Quarter-turn
- Continuous modulating duty
- Accuracy to 0.1% of span
- High speed
- Ambient temperature up to 107°C
- Optional remote electronics
- Non-intrusive setting
- Diagnostic Capabilities



## Jordan LA2000

- Linear
- Modulating duty up to 2000 starts per hour
- Ambient temperature up to 107°C
- Wide range of Speed / Stroke / Thrust combinations
- Optional remote electronics
- Compact design

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and

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