

Health Checks and Preventative Maintenance



Rotork actuators are designed and built to last – an attribute that is valued by many Rotork customers who have products dating back to the 1960s and 70s still in operation.

However, like all industrial plant our actuators are often exposed to hostile environments or at times can be stressed or damaged by unpredictable events. As a result, for customers who want to maximise their plant operability we offer health check and preventative maintenance services.

Customers who are currently making use of this offering find that:

- The reliability of the actuators on their plant is increased
- Problems are found before they affect operation
- Overall maintenance costs decline as Rotork operatives are much quicker at working on Rotork manufactured equipment and associated communication bus systems
- Small repairs are done on the spot avoiding the need for intrusive shutdowns
- Large repairs can be scheduled at a convenient time limiting the impact on operations
- Costs can be controlled and confidently predicted to allow for realistic budgeting.

Health Checks

A health check and the first step of a preventative maintenance contract involves a detailed assessment of the actuators and the updating of the customer's asset register of MOVs (including both actuator and valve data). If an asset register doesn't currently exist we create it. Against this database we record historic information from our own manufacturing databases (eg build specification and date), inspection data and performance data, which over time helps identify the start of any deterioration in specific MOVs and their associated communication systems.

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ROTORK AQ1/Q ACTUATOR INSPECTION SHEET

Job No. _____ Date _____ Engineer _____
Customer _____ Site _____ Contact _____

Actuator serial number: E7N090513
Actuator size: AQ200E14
Actuator wiring diagram: QP23006
Actuator speed: 64 SEC'S
Exhaust: RT
Valve tag number: SPARE

EXTERNAL VISUAL INSPECTIONS

Actuator base condition: N/A	DRIVE BUSH: Drive bush condition: GOOD
Cable entry: CORRECT	Drive bush retainer: CORRECT
Winding plug: CORRECT	Rotator grab screw: CORRECT
Terminal cover: CORRECT	
Electronics cover: CORRECT	
Battery Back-up: N/A	

INTERNAL CHECKS

Wiring: POOR	GEARCASE INTERNALS: Worn/damaged: N/A
Transformer: CORRECT	Worm/disk: N/A
Electronics: OK	MAIN PCB REPLACED BY F&E
Motor: OK	CONTAMINATED WITH METAL PARTICLES
Head Auto Mech: CORRECT	

ACTUATOR SETTINGS

Close direction: Clockwise	Close indication: Green
Close: CPT On / Off: Off	Open: Torque
Reset: E.S.D. On / Off: Off	Automatic: On / Off: Off

Section 44 Service Agreement 2001

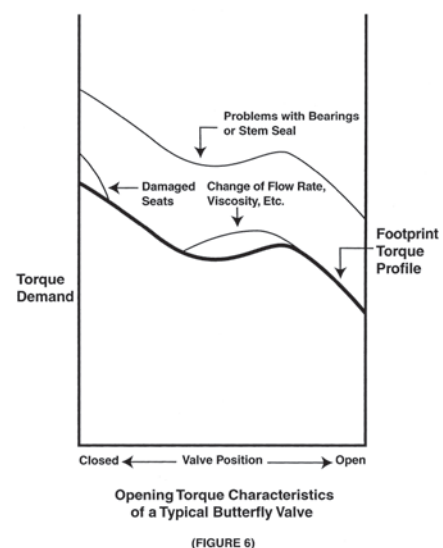
Some customers choose to receive just this detailed health check report. In these circumstance we will record the various options to make good any observed defects including the associated costs to enable customers to prioritise any investment.

The Preventative Maintenance Process

Where we are engaged to carry out preventative maintenance, we will carry out both intrusive and non-intrusive maintenance procedures (detailed overleaf) whilst carrying out the health checks. Data regarding the associated maintenance is recorded on the asset data base so that a complete asset history can be compiled and any degradation over time identified.



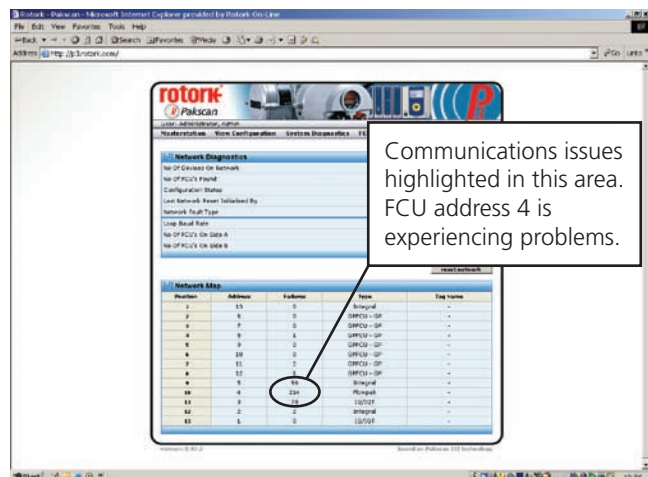
The second step is the collection and analysis of historical operational data from the MOV where it is available¹. This data is matched against the footprint torque profile for the particular MOV (where it has previously been collected - Rotork can collect these torque profiles for customers where we have been engaged to commission actuators). Through comparing the torque profiles common problems can be identified at an early stage.



Similarly, bus communication systems can also be tested (pulse shape, voltage, current, resistance, leakage) and the results used to identify weaknesses which can then be rectified.

A Tailored Offering

Rotork is engaged in hundreds of health check and preventative maintenance contracts for customers throughout the world. Our philosophy is to support our customers in maximising the performance of their equipment. Each contract is tailored to the specific customer's needs.



For larger sites (such as refineries) we have embedded Rotork engineers to work alongside the customers own staff on a day to day basis. This delivers the customer additional economies of scale whilst also ensuring that they permanently have expert actuation advice always on hand.

For most sites our engineers visit on an "as planned" or annual basis to complete the preventative and follow up maintenance. This ensures the maximum operational time for the plant and often the planned work is scheduled to co-incide with plant outages.

On all our preventative maintenance contracts a further one years warranty is given on all the work undertaken.

Typical Preventative Maintenance Actions on Actuators

1. External visual inspection of all external surfaces including paint finishes, control knobs and valve stems.
2. The oil level is checked and replenished if necessary.
3. Mounting bolts, nuts, washers and screws are checked for damage and tightness.
4. Confirmation that handwheel operation is possible and that there is physical movement of the valve.
5. Confirmation that local control works in both directions whilst checking for any signs of deterioration (eg undue motor noise). If the valve has a threaded stem and it has been operated more than 5000 times, the thread is covered with grease and the indentation on the thread is checked once it has gone through the drive bush.
6. Where available (through data loggers) historic performance data is investigated and compared against stored torque profiles.
7. The terminal cover is removed and the connections are checked for tightness. Additionally, the compartment is checked for water ingress and corrective action taken as necessary. The 'O' ring seal is replaced and if it is an Explosion Proof type actuator the integrity of the flame path is inspected.
8. The motor cover is removed and the motor is checked. The case is checked for any ingress of moisture. The 'O' ring seal is replaced. If the unit is an Explosion Proof actuator the integrity of the flame path is inspected.
9. The electrical cover is removed and the compartment checked for any ingress of moisture. The status of switches, contactors and electrical apparel are checked. The O ring is replaced. If the unit is an Explosion Proof actuator the integrity of the flame path is inspected.
10. All cover screws are replaced using grease to enable future removal and protect them from corrosion.
11. In the case of IQ actuators the battery is replaced.
12. On completion both local and remote operation are checked.

†All Rotork IQ Mk II, and IQT actuators have inbuilt data loggers; limited information is available from IQ Mk I actuators; operational data is only available from A and AQ ranges of actuators if they are connected to a Pakscan bus system as the Pakscan system itself stores operational data. Data is available from our pneumatic and hydraulic actuators if optional data recorders are fitted.



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