

Actuators are generally designed to be robust and give reliable operation. However, like all industrial plant, 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 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 initial corrective work undertaken prevents long term major failures, plus labour times associated with repairs are reduced through the use of experienced APS Exeeco engineers.
- Small repairs (that if left can lead to major failures) are done on the spot avoiding unplanned shutdowns and the costs associated with them.
- 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 (e.g. 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.

Item to Inspect / Test		Condition / Test Result	Further Details and Remedial Action
External Clearance	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Handwheel	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Terminal Cover - External/Internal	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Terminal Cover Bolts	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Missing <input type="checkbox"/>	No Missing / To be replaced *	
Terminal Cover Gasket / O' Ring	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Missing <input type="checkbox"/>		
Terminal Housing - Internal	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Main Voltage Internal Circuit	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Fitted V/I/S		
Limit Cover - External & Internal	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Limit Cover Bolts	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Missing <input type="checkbox"/>	No Missing / To be replaced *	
Limit Cover Gasket / O' Ring	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Missing <input type="checkbox"/>		
Limit Indicator	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Limit Switch - Internal	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Limit Switch Mechanism	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
AM Micro - Switches / Relays	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Photoeye	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>	Value - 0	
AM Electronics	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Hand Engage Lever	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Hand Engage Selection	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Motor Housing & Cover	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Missing <input type="checkbox"/> Nil <input type="checkbox"/>		
Motor Phase Balance	Value - 0		
Motor Insulation Resistance	Value - M 0		
Drive Drive	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Fitted V/I/S	Abts to View - V/I/S	
Other Gaskets / Seals	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Missing <input type="checkbox"/>	No Missing / To be replaced *	
Winding Balls	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Missing <input type="checkbox"/>		
Adapters / Drive Shafts	Working <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
General	Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor <input type="checkbox"/> Nil <input type="checkbox"/>		
Inspecting Engineer		Date	
Remedial Engineer		Date	

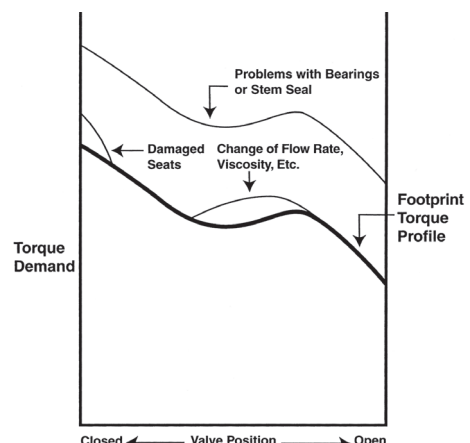
Some customers choose to receive just this detailed health check report. In these circumstance we will record the various options to make good any observed defects including the associated costs to enable customers to prioritise any investment.

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 available. This data is matched against the footprint torque profile for the particular MOV (where it has previously been collected). Through comparing the torque profiles common problems can be identified at an early stage.



Opening Torque Characteristics of a Typical Butterfly Valve

A Tailored Offering

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

Where customers have no formal asset management database we offer a tailored solution using our APS Exeeco database. We upload all the PM data gathered and store historic records for all actuator assets and related plant such as valves etc. At all times the data is available to the customer.

For larger sites (such as power stations) we have embedded APS Exeeco 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 contracts may include but are not limited to:

1. External visual inspection of all external surfaces including paint finishes, control knobs and valve stems.
2. Mounting bolts, nuts, washers and screws are checked for damage and tightness.
3. Confirmation that handwheel operation is possible and that there is physical movement of the valve.
4. The oil level and condition is checked to ensure no loss or contamination. Basic valve maintenance undertaken – valve checked and lubricated with appropriate grease.
5. 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.
6. The electrical cover is removed and the compartment checked for any ingress of moisture. The status of switches, contactors and electrical apparel are checked. If the unit is an Explosion Proof actuator the integrity of the flame path is inspected.
7. Motor is phase balanced and insulation resistance tested to ensure motor is safe to operate.
8. Cover screws lubricated and replaced where required, all cover o-rings / gaskets replaced.
9. In the case of Rotork IQ actuators the battery is replaced.
10. Where available (through data loggers) historic performance data is investigated and compared against stored torque profiles.
11. Confirmation that local control works in both directions whilst checking for any signs of deterioration (eg undue motor noise).
12. On completion both local and remote operation are checked.



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