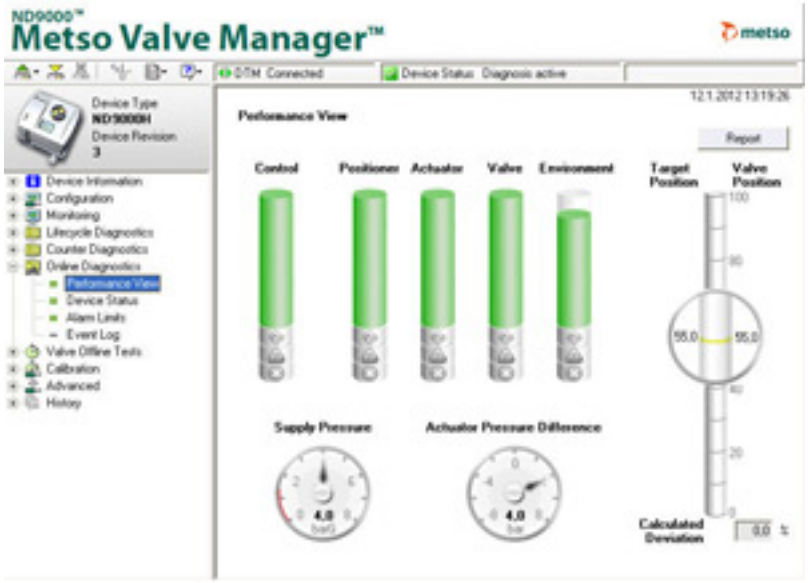
Control Valve Diagnostics Enhance Process Performance



Metso's new Valve Manager represents state-of-the art, third-generation valve diagnostics, and is capable of processing collected diagnostics information to visualize the condition of the valve in question with five different indices:

1. Control performance.
2. Valve condition.
3. Actuator condition.
4. Positioner condition.
5. Condition of the operating environment.

With processed and visualized diagnostics information, maintenance managers and engineers, and process operators are capable of making educated decisions concerning control valve maintenance without deep valve know-how.

Unexpected shutdowns can be avoided and control valve performance can be maintained at an optimum level by continuously monitoring the condition of the installed base at the plant or mill, and by taking the necessary preventive actions based on the available diagnostics information. Also, with the help of the diagnostics, the available maintenance resources can be more efficiently allocated during shutdowns.

When a so-called preventive or schedule-based maintenance strategy is followed, many valves are often needlessly maintained during shutdowns. By focusing the maintenance actions on the valves really needing maintenance, significant cost savings can be achieved through reduced spare part purchases and reduced need for maintenance resources.

Metso's new Valve Manager is available for the ND9000 Series intelligent valve controllers. The ND9000 Series intelligent valve controllers include several in build sensors, and they measure various internal parameters. Based on this data, and on the wide installed base and extensive service experience, Metso has developed mathematical algorithms to calculate the indices in the performance view.

Future Development Areas

Third-generation diagnostics are already available for control valves. The ame level of information can't yet be received from on-off or from ESD valve performance, but Metso is developing its valve solutions further to bring these features available for the on-off and ESD valves as well. The technology benchmark devices on the on-off side, such as Metso's SwitchGuard™ intelligent on-off valve controller, already include diagnostics features that are especially designed for on-off applications.

The industry standard for on-off valve control is presently more or less using solenoid valves to control the on-off movement. One of the downsides with solenoids is clearly that they can't provide any diagnostics data on the on-off valve performance. Thus, it can already be seen with ESD valves, which are the most critical type of on-off valves, that in new greenfield projects, smart partial stroke testing (PST) devices are being implemented.

The state-of-the-art smart PST devices, such as Metso's ValvGuard™, are used to conduct different tests for the ESD valves, both online and offline, providing diagnostics information on the ESD valve condition. The next step would be then to have the smart PST devices analyze the data further and provide similar indices that are presently already available for control valves.

For other on-off applications, besides the ESD, Metso has brought integrated solenoid and limit switch combinations to the market. An example of such a device is Metso's Axiom on-off valve controller, which can also provide basic diagnostics by giving fault alerts of possible changes in the on-off valve condition. Some customers have already identified the need for diagnostics on process-critical on-off valves, and integrated devices can be seen as a first step towards this direction.

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