Written by Adam Lund, Emerson Process Management Friday, 12 February 2010 09:31



Putting it as simply as possible, application of new design principles in capacity-assurance technologies is boosting usability and productivity.

It's a fact of life. Tools of the capacity-assurance trade have grown increasingly complex over the years. Advanced handheld field communicators, vibration analyzers and predictive maintenance software provide a wonderful means for managing automation systems and the assets they control in order to prevent breakdowns and avoid unexpected shutdowns. At the same time, it's often been difficult for users to understand—and respond appropriately in a timely manner to

—ever-growing streams of information that come out of many advanced technologies. The application of new, human centered design techniques to these tools, though, is changing all that. Applying such principles in the tools' design can lead to easier commissioning, configuring and maintaining of plant assets than ever before.

Identifying and delivering the essentials

The human centered design concept is aimed at identifying the information most needed by plant personnel and getting it to them in an easy-to-use format. This requires understanding the tasks frequently performed by end-users and presenting helpful information in a consistent fashion.

Years of professional analysis of industry work practices show that personnel are often overwhelmed with multiple systems and user interfaces, making it difficult to find critical information, especially while on a job in the field. The need for easier access to the diagnostics available in smart field instrumentation was apparent, along with clear presentation of that information and reliable troubleshooting procedures to follow in case trouble is indicated.

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Human centered solutions now

New device dashboards. . .

Emerson's commitment to human centered design and reducing product complexity (see Sidebars) is evident in intuitively designed interfaces known as Device Dashboards for more than 50 field devices. The new screens for our AMSTM Suite: Intelligent Device Manager PdM software give workers an instant view of the critical items they need to evaluate, diagnose, and configure each device. Expert guidance is also provided to streamline the most important and frequently performed tasks by plant operations, engineering and maintenance personnel.

Powered by enhanced Electronic Device Description Language (EDDL), these human-centric dashboards function independent of communications protocols such as HART®, WirelessHART™ and FOUNDATION™ fieldbus. Their role is simple: Provide a framework for the uniform display of device information to make complex information easier to understand.

Creating the basic structure for the new graphical interface (shown in Fig. 1) was a major step in implementing the human centered design concept to aid maintenance personnel. Following identification of the most common tasks performed by technicians in the field, application of human centered design principles led to screen displays that provide information on 80% of those common tasks by telling if the device is working (or not), if alerts are present and if the device is communicating and providing access to calibration functions. The information presented is simple to understand—with no confusing technical jargon to interpret.

The design of the new dashboards features noticeable improvements in the navigation structure, which has been revamped to group information and functions into three primary areas: "Overview," "Configure" or "Service Tools" (depending on the job at hand). When first checking out a device, a technician will see the "Overview" screen that contains the "Status" condition of the selected device. If the status displays as "Good," he/she knows there is no problem with that device, but can also check the gauges in the "Primary Purpose Variables" area to confirm that the device is operational. A "Shortcuts" section provides more information and links to commonly used device capabilities, such as "Calibration" methods.

If there is a problem (as shown in Fig. 2), the word "*Maintenance*" will appear in the "Device" box, along with a button for further evaluation. This will provide guidance for further action to

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determine the nature of the problem and whether the device needs to be replaced or repaired. In this case, the temperature transmitter indicates that it automatically switched to a back-up sensor when the primary sensor failed—

and a pop-up window is available with problem-solving instructions.

The Time Has Come "In evaluating how people use maintenance tools, we found a common problem," says Peter Zornio, chief strategic officer at Emerson. "The routine steps required by plant personnel to work through automation system issues were often cumbersome and confusing, and the interfaces were very product and feature oriented instead of task-centric. They assumed the user had a detailed knowledge of the product. Based on the inputs of many process-industry workers, we have initiated an across-the-board overhaul of our products intended to improve the speed and accuracy of their job performance and to increase each individual's productivity." According to Zornio, by putting increased emphasis on ease-of-use, Emerson can help its customers meet the demographic challenge as knowledgeable maintenance veterans retire and their places are taken by less experienced personnel. "The time has come," he says, "for technology to begin serving people."

Revised device descriptions. . .

Every smart field device stores diagnostics, but not all devices have the same information—whi ch may cause wildly different displays depending on the Device Descriptions (DD) provided by the manufacturer

. Device Descriptions are essentially files of field device attributes residing in a host (such as Emerson's AMS Device Manager PdM software). These DDs vary from manufacturer to manufacturer with respect to how information is extracted and presented. As a result, multiple, often confusing instrument displays confront plant maintenance personnel.

Revising the DDs on Emerson field devices has been another part of implementing the human centered design concept. This is especially important in giving the same "look" or appearance to the screens for HART and fieldbus devices. This type of technical achievement will help field personnel be more productive because they can use the same procedures to manage devices regardless of communication protocol.

The condition of any field device can be displayed in this way as long as the DD is written according to the guidelines. For us, the principal focus has been to update DDs of smart devices including Rosemount, Fisher, Micro Motion, and CSI branded products. A great deal of effort has gone into this project, and the DDs of the most frequently used devices have already been rewritten and stored in the latest versions of AMSTM Device Manager and the DeltaVTM and OvationTM digital automation system hosts—and more are underway.

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