The OMNI Transmitter

OCTOBER 2013 NEWSLETTER

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Inside This Issue:

Electrical and Controls Reuse and Repurpose

By Mike Kornas

Budget is an enormously important part of every project, and one of the ways companies can save money nowadays is to reuse existing electrical and controls equipment.

To determine which electrical equipment can be effectively reused, systems must be thoroughly examined and cost-evaluated by a knowledgeable expert. In many cases, lighting can be refurbished and re-lamped, and diffusers can be replaced. Transformers, panels, and substations can be cleaned, retested, and relabeled. Feeders can be Megger-tested to verify the condition of electrical insulation and put back into use.

A significant amount of money can be saved by reusing existing controls systems, but refurbishment can sometimes be more costly than installing new equipment, so it is imperative to have an instrumentation and controls specialist evaluate the systems to determine what is worth salvaging and what should be replaced. Existing controls and other low-voltage systems (fire, security, process, etc.) can be successfully and cost-effectively refurbished with the addition of new instruments, pneumatic controls, tubing, actuators and valves, so long as the equipment is still factory-supported and parts and software are still readily available.

To find out more about how you can effectively reuse existing electrical and control equipment on your project, contact Omni at 908-412-7130.

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OMNI TECH TALK: Choosing Between Soft Starters and VFDs

Soft starters and variable frequency drives (VFD) can both be used to reduce the inrush current and torque that can occur when motors are accelerated to full speed. Both protect motors from damage at startup, but the key difference is that VFDs control motor speed throughout the run cycle and soft starters can only be used at startup and stop. Choosing between the two depends on the application, performance requirements, and overall costs.

Soft starters, also known as reduced voltage soft starters (RVSS), work by gradually ramping up voltage to the motor. They are smaller and less expensive than VFDs. Soft starters are often used in applications such as cooling towers, large circulation pumps, and fans that only require speed and torque control at startup. VFDs, unlike soft starters, offer constant speed control during the entire operating cycle of a motor. They offer superior energy savings, integration, control, and diagnostics. Though they can initially cost two or three times more than a soft starter, VFDs are often a better overall value for applications that require the energy and functionality advantages they offer.

Omni can help clients determine whether a VFD should be used for their particular application, or if a soft starter will suffice. To learn more, please contact us at 908-412-7130.

TECH TIDBIT: Trouble Shooting

When faced with sudden roadblocks such as where to terminate control wiring, an alarm point, or understanding what an LCD error code means, on-the-spot help can be easy to find. Equipment manuals, installation instructions, and operation and maintenance information can usually be found by entering manufacturer, model, and a brief description of the issue into a smart phone, tablet, or mobile broadband-enabled laptop.

The OMNI Safety Corner

Safety is our #1 priority. As part of our continual commitment to training, compliance, and improvement, we updated our safety manual for Spring 2013.

Omni has participated in numerous OSHA VPP projects, and we are ISNetworld approved.

VPP

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FROM THE PANEL SHOP: Functional and Performance Testing By Craig Drabyk

When electrical, mechanical, and process systems are installed and equipment is successfully started up and verified, a good contractor doesn't just collect payment and walk away. This is only the halfway point. Functional testing and performance testing play an essential part in ensuring delivery of a successful project

Functional testing should be performed using a detailed Sequence of Operation that has been thoroughly reviewed and approved. Anomalies that arise must be corrected and retested to satisfaction. On large projects, sequence testing can go on for weeks, often continuing around the clock, when systems are often turned off and back on, to determine after-hours function. Verifying that safeties and critical alarms work properly and shut down systems when needed is a top priority. If it becomes necessary to make sequence modifications, the changes must be documented accordingly.

Performance testing occurs after functional testing has been completed and the facility is up and running. Systems are subject to operating conditions that may range from normal to worst-case-scenario to determine its performance, response and stability.

Five Common Control Valve Problems

Some control valve problems can be relatively easy to detect, but others are more difficult to identify without performing specific tests. Before attempting to tune a control loop to improve loop performance, here are five of the most common control valve problems to look for:

Deadband, sometimes known as hysteresis, can be caused by backlash between the control output and actual valve position. It can also be due to mechanical friction or looseness. This can cause oscillations under PI or PID control. **Stiction** is static friction that can cause a valve to stick in position. When the valve breaks free, excess pressure causes it to overshoot its target position. Common causes are over-tightened valve stem seals, sticky valve internals, undersized actuator, or sticky positioner. **Positioner** overshoot often results when a valve positioner is defective or tuned too aggressively, and changes in controller output can cause the valve to overshoot its target position. **Oversize control valves** can lead to poor control performance. Full flow should be obtained at 70-90% depending on conditions, and if valves are sized too large, small changes can significantly affect flow. If other valve positioning problems exist, oversize valves will further amplify the negative effects. Finally, **nonlinearity** can lead to tuning problems. If a control valve's flow characteristic is nonlinear, control loops tend to become sluggish or unstable when the valve position moves away from its operating point.