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Newsletter Article Links

<http://asope.org/Crossword5.html>

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Proprietary VS Non-Proprietary Control Systems

**By Rick Bullard
Bullard Industrial Technologies, Inc.**

Original Equipment Manufacturers (OEMs) all provide their own design of control systems for equipment such as building HVAC systems, boiler combustion controls, air compressors, chillers, absorption systems, steam turbine generators, combustion turbines, cooling tower controls, water softening systems, etc. These "canned" systems are designed to control, protect and monitor the equipment the OEMs provide. The control systems can be of several designs and configurations. Some systems utilize microprocessors consisting of multiple brands of components packaged together and sold as a "unit". These systems are common among suppliers of HVAC systems, pumping systems, cooling towers, etc. Other, specialized control systems utilizing multiple field devices and systems like those on boilers, steam turbines and combustion turbines use individual "loop" (single loop or multiple loop) controllers for each component of the control system. Still others use programmable logic controllers (PLC) to control their systems from a single or sometimes multiple PLCs. Even PLCs can be custom-designed by the OEM that makes it difficult for other to service them in the field.

Hint to the customer or end-user: When reviewing vendor literature regarding such equipment and control systems words such as "proprietary", "exclusive design", "patented system", "fool proof design" should send up a "red flag" in your mind as they mean nothing but bad things for you when you purchase their systems but many times you have no choice in the matter. They all mean big problems down the road after the warranty expires. If you purchase such a system and plan on staying with it, radically adjust your controls engineering and equipment budget for the next several years to compensate for the money you will be spending to support these proprietary systems. Make sure these funds are readily available for unforeseen emergencies because you will need them. If you have company-provided credit card that can be used for this purpose, plan on using it on a regular basis as well.

The control systems supplied by the OEMs are designed to be proprietary, meaning that the end-user or customer cannot access them to make repairs or changes of any kind that may be necessary to keep the equipment fully operational. It's true that during the warranty period which is usually 12 months after purchase or 18 months after delivery and startup, that the OEMs

will support their systems by providing their own Controls Engineers or Field Service Technicians to repair, replace or re-program their proprietary systems and related components. Once the warranty expires, the customer must then pay the OEM to provide such service.

The proprietary nature of these systems prevents the customer's employees such as Electricians, Controls Engineers, Equipment Operators and Maintenance Technicians from being able to work on these systems to make repairs as needed.

This creates several potential problems and difficulties for the customer who is now "stuck" with a control system that can only be supported and serviced by the original manufacturer of the system:

1. **Cost:** Hiring the OEM to provide a Field Service Engineer or Technician can cost \$1,200 to \$2,000 per day plus travel and lodging expenses to work on their proprietary systems. This increases lifecycle costs of the equipment.
2. **Logistics:** (This can be the most critical problem) If the OEM does not have a field office or local service center, a Controls Engineer or Field Service Technician may have to be dispatched from several hundred to several thousands of miles away. This delays the response time. If your equipment or system is critical and is shut down due to control problems this may result in lost production, lost revenue and possibly put your facility in a dangerous situation. Example: You are on East coast and the manufacturer is on the West coast. Do the math. Plan to wait a while until he gets there and get out your check book because coast-to-coast or equivalent travel isn't cheap.
3. **Troubleshooting:** Proprietary systems make it difficult if not altogether impossible for your employees to troubleshoot problems quickly and make necessary repairs in a timely manner to prevent equipment outages, downtime and/or lost production. This can drastically reduce the reliability of the equipment and related systems.
4. **Replacement Parts and Components:** Many times proprietary systems will be designed to not accept common replacement components such as power supplies, transmitters, transducers, switches and relays. This is accomplished by programming language that requires someone to possess an electronic "key" or "source code" to enable the system to recognize the newly installed components. Keys and source codes remain the property and in the possession of the OEM, thus preventing the customer, end-user or any other outside contractor from repairing the equipment to keep it running. Again, you must call in the OEM to access the proprietary system and make it work. Check book or credit card time!
5. **Equipment Additions or Upgrades:** If you need to add more equipment, components, add functionality or upgrade your system in any way, the proprietary nature usually prevents this without spending big bucks to again, bring in the OEM to assist with this, at a premium cost and whenever it fits the OEM's schedule.
6. **Obsolescence Trick-Bag:** Many times OEMs purposely design their control systems with outdated or marginally-available components. This makes their system obsolete within a relatively short time. Possibly in the 2-3 year range which is conveniently just after the warranty expires. Now the customer is once again at the mercy of the OEM for the "latest and greatest" replacement system that may or may not physically fit in the original equipment enclosure and again, the replacement system will also be proprietary.

Time to get out the check book again and pay more big bucks to the OEM for another of its wonderfully restrictive, complicated and expensive retrofits to make your "new" system that is now less than 5 years old, functional again.

To the veteran of these proprietary controls wars none of this is new to you. To the novice or someone just being confronted with a newly defunct or now in-need - of repair, controls system, the big question is "Why does industry permits OEMs to hold the customer hostage like this?" One answer is that most customers don't have the ingenuity or fore-thought to see these nightmares coming because they are under the false impression that they are purchasing a "state of the art" bullet-proof controls system. The other, more obvious reason to the veteran is that you can't buy a non-proprietary controls system from an OEM. True, you can purchase the equipment without a controls system but the OEM will not warrant the equipment without the OEM's controls. Consequently, you will not be permitted to purchase a 'bare' system and install your own controls. If you try to purchase a "bare" system (with the intent of installing your own controls system) by fooling your Engineering Department or Purchasing Group, and are successful, you will most certainly find yourself standing by the side of the road picking up pennies, aluminum cans or other such recyclables to sell for money as you will be out of a job as soon as someone realizes you have purchased a system with a voided warranty.

So, you are basically "stuck" with the proprietary system for the life of the warranty which as previously stated is usually no more than 18 months after installation and startup. Once the warranty expires and components start to fail, you are now held hostage by the OEM to service his proprietary system. Or are you? The answer is no, you do not have to allow yourself to be put into this subservient situation. The keyword to the solution to your problem is **SYSTEM INTEGRATOR**. Get out from under the thumb of the OEM by hiring a System Integrator to design a generic, PLC-based control system. A System Integrator will use your PLC of choice, your field devices of choice and your program of choice to design, build and program your control system so that your in-house employees or whomever you want to hire, can manage your control system. A PLC-based control system procured through a System Integrator will be much cheaper than the OEM-designed system and it will be the last system you will have to design and build to operate your equipment.

If you chose to do so, System Integrators charge substantially lower rates to service your system than the OEM. They are more readily available for on-call and regular scheduling and the PLC, its components and your choice of field devices are all much cheaper to purchase than those supplied by the OEM.

A generic, PLC-based system can be serviced, repaired and upgraded by anyone who can understand any of the several standard PLC languages. PLCs are relatively cheap compared with OEM proprietary systems using microprocessors, loop controllers or an OEM-designed PLC with the same type of proprietary programming. System Integrators will take one of two approaches to designing your generic system. They may opt to try to "break the code" of the OEM system and get into the programming language to figure out how the system needs to be configured. Because of the ingenuity of OEM Engineers, this can sometimes be a costly and time-consuming process that more often than not results in failure because the System Integrator cannot completely read or decipher the code and programming language of the OEM. The more logical, cheaper and faster approach for the System Integrator to take is to basically start from "scratch" both in building and programming a PLC system using standard PLC products and off-the-shelf hardware (components) for the system.

The second approach will most likely require the System Integrator to interface with the customer's Controls Engineers, Technicians, and Operators to

determine exactly how the equipment is designed to function so that the PLC system can be built with the proper components and the program can be properly written. Once the program is written and de-bugged to assure reliability, the program can be saved in a variety of ways to assure it can be recovered and re-used if the PLC or the program becomes damaged. Due to their relatively low cost, two or more PLCs are used simultaneously with one being a backup to the other to control a system. This built-in redundancy assures that the system will continue to operate should either of the PLCs become inoperable. The PLC program can be stored on disc and sometimes is done with multiple copies stored in fire-proof safes to assure recovery in the event of a disaster. Many times the System Integrator will also keep copies of the PLC program for both security and ease of programming changes or system upgrades as they are required.

Now the customer has an "open architecture" PLC control system that can be easily and readily serviced by "in-house" personnel or by any of several System Integrators that are available all over the United States and for that matter, all over the world. Using in-house personnel can accelerate repairs and drastically improve uptime of your equipment and systems. Also, with proper security measures such as "firewalls" and passwords, this type of system can be readily reviewed and programming changes made via remote locations using dial-up phone modems or over the Internet by both in-house personnel or by System Integrators.

Log Sheets

**By Larry Tarvin
O&M Consulting Services Inc**

In response to comments on an article I wrote with Carroll Hooper in a previous ASOPE News Letter on log sheets. The main reason for log sheets is to preserve historical data; this is the responsibility of the operator. The major way an operator preserves data is maintaining the operator log sheet. If that information is retained in the operator's mind, the other operators replacing him/her as well as other personnel will not have the needed information. Lack of information can have a significant impact on the cost of a plant's operation and recovery in the event of a failure.

Lausche Heating Plant will burn coal again on Tuesday

ATHENS, Ohio -- After shutting down the coal boiler on July 10 for construction purposes, the Ohio University's Lausche Heating Plant will begin burning coal again on Tuesday, Oct. 28.

The coal burning process will begin around 6:30 p.m. on Tuesday and may cause some smoking from the smoke stack. The smoke during the start-up period will contain a fly ash residue, which may fall in the area surrounding the heat plant depending on weather conditions.

After an estimated two-to-four-hour warm-up period that will increase the coal boiler temperature to more than 300 degrees, which is typical of this process,

the smoke from the boiler will pass through the newly constructed bag house at the plant, which operates like a vacuum cleaner bag. The bag house will then filter the particulates out of the smoke before it leaves the smoke stack.

The coal boiler temperature must be more than 300 degrees before the smoke is passed through the bag house to avoid shortening the lifespan of the bag house.

The conversion from natural gas back to coal will save the University money, because the cost of coal can be four to five times less expensive than natural gas.

The heating plant's coal boilers were shut down on July 10 to accommodate the installation of a new bag house and a state-of-the-art multi-pollutant flue gas treatment process. The innovative process will be ready for testing in late November and will allow Ohio University to continue to burn Ohio's high-sulfur coal using the patented sulfur dioxide absorbing material called Fluesorbent. The completion of this project will enable the University to exceed current and future proposed Environmental Protection Agency (EPA) standards for sulfur and particulate pollutants.

"The fact that the heating plant will begin burning coal again moves Ohio University one step closer to having a state-of-the-art flue gas treatment system," said Ohio University Associate Vice President for Facilities and Auxiliaries Sherwood Wilson. "When we begin burning coal again on Tuesday, Lausche Heating Plant will be more environment friendly than it ever has been."

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ASOPE™ Cross Word Puzzle 5

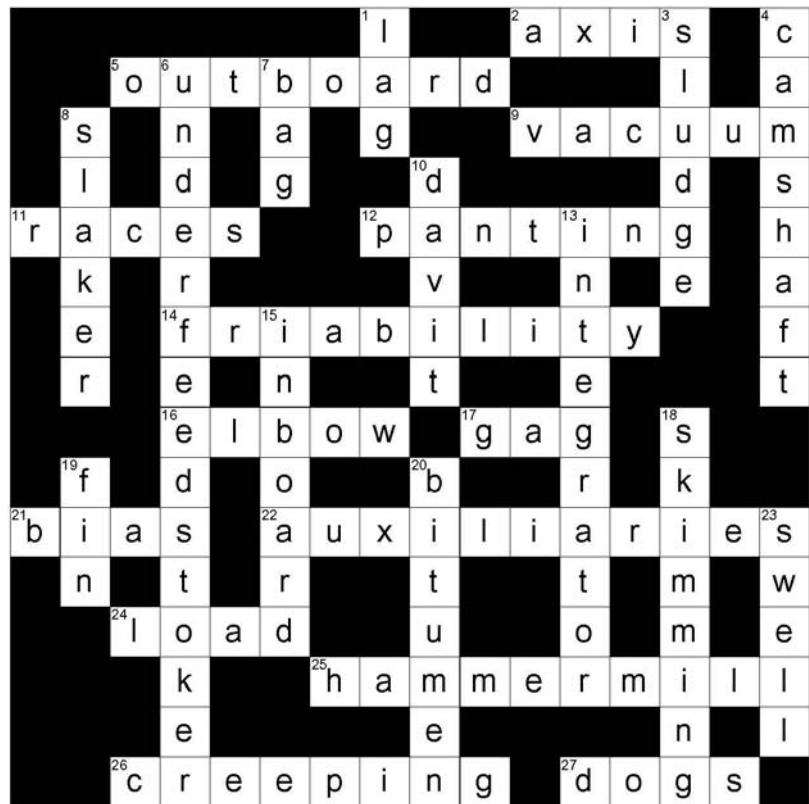
Visit the link below for new ASOPE™ Cross Word Puzzle Fun.
<http://asope.org/Crossword5.html>

Answers will be posted in next month's newsletter.

Answers to last month's Cross Word Puzzle 4 is listed on the following page.

Answers to ASOPE™ Cross Word Puzzle 4

ASOPE CrossWord 4



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