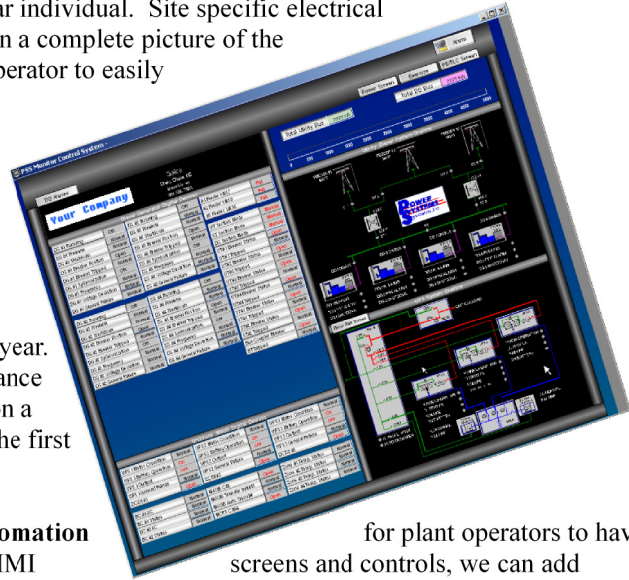# Monitoring And Control Systems

When looking at the cost of a building monitoring and control system with SCADA/HMI systems, facility personnel have to consider not only the cost of the system but the potential savings that this type of system can provide. These savings can be in the form of preventing the loss of power in facilities to preventing equipment damage. Industrial process automation has the potential to save facilities significant costs in personnel time and the replacement of older equipment. The following information should be considered when thinking about a SCADA Building Monitoring and Control system.

The **PSS Monitoring and Control System (MCS)** presents information in a clear and understandable method for all levels of personnel, from engineering to the untrained or unfamiliar individual. Site specific electrical one lines, floor plans, and related equipment are presented in a complete picture of the data center infrastructure or the total facility allowing the operator to easily identify potential problems and status of their site.

Do you monitor the Diesel Generator's start batteries?
When you need the generator to start, your system is relying on the start batteries to work. On systems where the UPS, generators, and breakers are monitored site personnel need to be informed and the batteries can then be replaced before they are needed in an actual power outage. Typically generators have preventive maintenance performed twice a year. However the start batteries can fail before the next maintenance visit. By including the monitoring of engine start batteries on a SCADA system, site personnel can replace the batteries at the first sign of weakness.

We can develop custom systems for **industrial process automation**   for plant operators to have improved control of their system. By making customized HMI   screens and controls, we can add functionality and extend the operational life of older equipment. This saves plant managers from having to purchase new equipment by retro fitting the existing equipment with new controls, thereby saving the company significant money.

Systems can be setup for auto restart functions, start lockouts, and alarm notifications Automating manual process on pumps and fans,. These systems can be expanded to individual requirement for the facility s. For example, when a pump is not running because a switch is in the wrong position or the operator has failed to restart the pump, the industrial process can be stopped, causing time delays with long process reboots, not to mention potential equipment damage. When these process are monitored, site personnel can be informed immediately so that corrective action can be performed before the industrial process or the facility is impacted.

Do you currently monitor for water leaks? Monitoring for zone water detection and spot water detection leaks can save facilities from potentially large costly equipment failure and repair bills. Remember not all leaks are at floor level, what happens when a pipe develops a leak in a false ceiling over equipment racks? Eventually the ceiling gives way and drops down on the equipment and the leaking pipe continues to leak on the equipment racks. This potentially will lead to equipment failure and damage. When placing monitoring leak detection units in false ceilings above equipment racks the facility can be better prepared to respond before the water has a chance to destroy expensive equipment. Not only can these water detection units indicate leaking pipes they can also show condensation problems. This will not only allow the site personnel to ensure that the humidity in the room is being maintained at the proper level but also the humidity above the false ceiling is being maintained. Site personnel need to be aware, that it may not be their pipe or chiller that leaks but another company's equipment on an upper floor that has developed the leak and the water could eventually makes it way down to your company's floor.

Off the shelf Components are important in system design. We do not recommend using expensive custom monitoring boards. *Custom Monitoring boards* are boards or components that are developed to monitor specific equipment by third party companies. Then these components feed information to proprietary collectors that then transfer the data to the SCADA system. We prefer to implement our design with off the shelf components. There are a couple of reasons that we design our systems this way. Over the course of the life of the monitoring system it is cheaper and easier to replace with standard off the shelf components than custom boards. Custom boards can be discontinued and not have any direct replacement available. Standard off the shelf components can usually be sourced from more than one vendor, ensuring that if a product is discontinued by one company then it will be readily available from another company. This is important consideration for facilities that do their own maintenance so that they can source replacement parts easily.

When a facility has older equipment that does not have built in communication ability, there are several ways we address this issue to insure proper monitoring. One of the best solutions is to use remote I/O to monitor the equipment. Remote I/O are components that can have both digital and analog inputs/outputs into the device which can communicate this information back to the monitoring systems. The remote I/O can be connected to unused contacts or slaved off of other devices to get the status of the equipment. Remote I/O is ideal for use with temperature and humidity sensors and water detection sensors to get this information into a standard protocol that the MCS can monitor with out having to have dedicated monitors. In some cases it may be better to use custom PLC controls rather than remote I/O.

The design of the UPS backup for the building monitoring systems is important! The MCS system needs to be backed up with a stand alone dedicated UPS module. Normally we do not recommend using smaller UPS units when there is a large facility UPS system available. Typically the larger UPS systems are more efficient, but in this type of design the SCADA system needs to be able to monitor the main UPS system if it fails and to record what happens during the failure. This will allow technicians and site personnel to see and understand the events that took place during this critical point in time. Trouble shooting failures becomes easier and less confusing.

It is important to consider the company that is designing your SCADA/HMI system. PSS takes pride in the individual service we provide each customer when developing a system that meets their unique needs. From custom designed screens to customized alarm messages, PSS can implement system layout and implementation based on the input form your staff.