

Cogeneration and Trigeneration

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Cogeneration, also known as combined heat and power (CHP), is the process in which a single fuel source is used to produce both electrical and thermal energy. Most cogeneration plants in the U.S. are operated by non-utility companies and institutions. These on-site plants capture waste heat to be used to produce thermal energy for reuse such as process steam, hot water, space heating, and cooling, or as fuel to generate even more electrical power.

Trigeneration, or combined cooling, heat and power (CCHP) is similar to cogeneration, but it generates cooling in addition to heating and electricity. Both plant types are highly efficient, providing substantial energy savings and reducing environmental impact. They can range in size from small units to large plants serving industrial sites, college campuses, or entire towns.

A cogeneration or trigeneration project instrumentation and controls contractor is responsible for controlling the utilities (natural gas, water, etc.) feeding the major equipment and installing communications between the vendor control systems to ensure safe operation of the processes. Smaller CHP projects typically utilize pre-assembled package equipment such as gas compressors, turbines, and HRSGs (heat recovery steam generators), while larger projects typically require more field assembly due to larger equipment size. It is essential that I&C contractors work closely with vendors on equipment assembly, startup and functional testing, and loop check and precise calibration are of utmost importance. As with any complex project, proper commissioning is key to operating an efficient and safe cogeneration or trigeneration plant.



OMNI TECH TALK: Occupancy Sensors

Occupancy sensors are devices that turn equipment on and off in response to the presence or absence of people in a specific area. These devices, which have been proven to significantly reduce energy consumption and provide long-term energy savings, are widely used for lighting control, and as the technology progresses, more and more buildings and facilities are integrating HVAC controls into the mix, with great success.

The typical occupancy sensor used for lighting applications uses infrared or ultrasonic technology (or a hybrid of the two) to detect motion within a space. When someone enters the area, a control unit activates the lights and keeps them on while the space is occupied, and turns them off when no motion is detected for a set period of time. **Lighting occupancy sensors can be expected to cut electricity use by about half.**

Occupancy sensors used for HVAC controls automatically adjust climate settings when motion is detected in a room or area. Since HVAC accounts for 50-70% of primary energy consumed in commercial buildings, these devices provide huge potential for significant energy savings and can prolong equipment life. Advanced ventilation controls offer about eight times more savings than advanced lighting controls.

Groundbreaking occupancy sensor technology that is now under development is expected to generate even **greater energy savings by detecting not only the mere presence of people but the number of occupants in a zone or area.** Currently, most sensor-based ventilation systems operate at a set capacity, whether there are two or two hundred people in a room. Future sensing devices will be capable of determining how many people are present, and adjust fan speeds and air movement accordingly. A recent study by the DOE estimates that these sensors will save twenty-eight times more energy than today's already-energy-efficient sensors when used for both lighting and ventilation, and will reduce the annual energy bill of the average large building by an impressive 18%.

The use of occupancy sensors for lighting and HVAC are proven energy savers and should always be installed in new buildings, and retrofitting existing buildings almost always produces significant energy gains as well, even considering the expense of installation. To find out more about occupancy sensors, contact OMNI at 908-412-7130.



TECH TIDBIT: Arc Flash

Arc flash is a violent phenomenon that can cause serious injury or death. **OSHA requires that equipment operating at 50 volts or more be evaluated for arc flash and shock protection, and an Arc Flash Hazard label must be affixed to the equipment.** These labels specify the level of PPE that must be worn, flash hazard boundaries, and other safety requirements that workers must abide by.

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 2014.

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



FROM THE PANEL SHOP: Network Certification By Craig Drabyk

Your network is the most important part of your process and controls. That a network should be well-designed, installed, and commissioned goes without saying, but certifying your network is absolutely vital to its future reliability and performance. Network-related issues are notoriously troublesome and complex to diagnose, and if the crucial step of network certification is omitted, a multitude of costly and often show-stopping problems can arise.

Network segments should be pretested before connecting instruments to rule out trunk and backbone hardware issues should problems arise during device installation. The certification process can only commence after all devices have been installed, powered up and commissioned. Otherwise, readings will be inaccurate and will not reflect a true status of the health of the network.

Oftentimes, when Omni is called in to troubleshoot a network problem, it is immediately apparent that the network had never been certified, either because the client didn't know to require it, or an installing contractor had purported to have certified the network but, in actuality, had not.

Network certification should be a requirement on every project, and clients should receive all documentation to as proof of certification and to serve as a baseline if problems or faults occur in the future.



PanelView Graphic Terminals



Allen-Bradley's robust PanelView graphic interface terminals allow operators to monitor, control, and display information for process and HVAC applications. PanelView graphic terminals are widely used, highly versatile and come in a variety of sizes, memory options, and configurations. They can be operated by touchpad, keypad, or a combination of both. PanelView terminals are ruggedized for rough handling, shock, vibration, and variations in temperature and can be used in a wide range of industrial settings. Omni often recommends the flexible, reliable, user-friendly PanelView to clients as the best choice for a site-wide standard.