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The Value of Retro-Commissioning For Existing Buildings

Retro-commissioning, or RCx, is the systematic application of the commissioning process to an existing building to improve performance, increase occupant comfort, and reduce energy costs. RCx is a highly effective, economical approach that brings MEP systems back to design intent and usually results in substantial energy savings.

The best candidates for retro-commissioning, naturally, are older buildings that have undergone operational changes over the years, resulting in poor efficiency, or were never properly commissioned to begin with. Space is converted or reconfigured, and equipment is added or patch-repaired. With today's complex control systems, small problems can trickle down and degrade building operations. Settings are improperly changed or circumvented, or never properly programmed to begin with, and instruments go out of calibration. Newer buildings can benefit from retro-commissioning, as well, if unaddressed deficiencies are present from the start.

Omni's retro-commissioning program starts by identifying systems to be analyzed and developing a plan specific to the facility. Documentation is examined to determine design intent, followed by monitoring and testing of building systems including fire and emergency systems, electrical, control systems, sequence of operation, occupied times, etc. Deficiencies are identified, repairs, changes and improvements are made, and results are verified. Finally, the client is instructed on how to sustain optimal efficiency. Average energy savings following RCx range between 10-15%, and even as high as 20%, and payback typically occurs in about one year.



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OMNI TECH TALK: Tesla Builds World's Biggest Battery in Australia

In late November 2017, Tesla connected the world's largest lithium-ion battery to an Australian state power grid to store energy reinforce power supply during peak usage periods, and prevent blackouts in the outage-prone region. So far the battery, which is tied to South Australia's Hornsdale Power Reserve wind farm and can power 30,000 homes for an hour, has exceeded expectations by supplying split-second power on-demand and helping to stabilize energy prices. Some are hailing the technology as the future of sustainable energy.

Tesla CEO Elon Musk kept his pledge to have the football field-size battery in place within 100 days or it would be free, linking the 100-megawatt/129MWh battery to the grid just 63 days after the contract was signed. Within weeks of its startup, the battery prevented two major energy outages, kicking in within 0.14 seconds when one of Australia's largest plants experienced a sudden drop in output.

Another immediate benefit of "the big battery" is a 90% reduction in the cost of frequency control and ancillary services, or FCAS, a network of services that helps maintain Australia's power system. Previously, suppliers have routinely charged about ten times the normal price of power for FCAS, or as much as \$14,000/MW. But when the battery came online Hornsdale Power Reserve began offering FCAS for an average of \$270/MW, and as a result took in 55% of all FCAS revenues in South Australia in the battery's first four months. If this trend continues, South Australia could pay back the \$50 million cost of the battery in as little as one year through FCAS alone.



Hearing Loss Protection

of them suffer permanent hearing loss. Use of hearing protection devices (HPDs) is an imperative in the construction industry, including electrical.

Thirty million people in the U.S. are exposed to hazardous noise in the workplace, and about 20,000

Prolonged exposure to excessive noise causes cumulative and irreversible hearing loss that degrades quality of life and cannot be corrected by surgery or hearing aids. Hearing loss and high jobsite noise levels can cause stress, loss of concentration, decreased productivity, and inability to hear warning signals on the job, which can all contribute to accidents and injuries. Recent studies have also shown that workers continually exposed to excessive noise are two to three times more likely to suffer from serious heart disease than workers who were not exposed.

OSHA requires HPDs when workers are exposed to noise levels above a time-weighted average of 90 dB over an 8-hour day. At 100 dB, unprotected exposure of more than 15 minutes can cause hearing damage, and at levels above 110 dB, repeated exposure of one minute significantly increases your risk of permanent hearing loss.



There are many ways to prevent hearing loss in the workplace, such as using low-noise equipment, noise barriers, limiting exposure time, and strict use of HPDs. Types include earplugs, earmuffs, canal caps, semi-audal bands, and devices that electronically block out noise. HPDs must carry a noise **reduction rating (NRR) sufficient for workplace dB levels, and should be worn for the duration of exposure.**

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FROM THE PANEL SHOP: The Importance of Keeping Critical Spare Parts

One of the best ways to minimize downtime due to parts failure is to keep critical spare parts on hand. This can be done with a nominal investment that will save substantial time and money in the long run.

When a critical MEP part fails, time is of the essence. The bad part must be identified, located, and ordered from either the manufacturer or a dependable representative, and about 75% of the time the part is not in stock and must be ordered. Lead time is commonly anywhere from 10 days to 3 weeks. Sometimes a specialty part must be manufactured, which usually takes about 4 to 6 weeks or more. Or, the part is no longer produced and new version must be purchased and modified. All this comes at a high price; besides the cost of extended downtime, expedited shipping can cost a pretty penny – sometimes hundreds of dollars – and it isn't uncommon to receive the wrong part, requiring you to start the process all over again.



Fortunately, there is an easy, relatively low-cost solution: critical MEP parts and instruments should be purchased and kept on-hand in case of failure. Knowledgeable contractors like Omni can assess systems and equipment to determine which parts and instruments should be stocked as backup, and how many, depending on their criticality, availability and likelihood of failure. Critical parts that should be kept as “attic stock” can include pressure, temperature, level and flow transmitters, critical starters, elements and sensors, actuators and positioners, etc. The large

majority of crucial parts and instruments that can shut down production when they fail can be purchased for just a few thousand dollars, and this supply will pay for itself many times over in saved shipping costs alone.

Case in point: a client that had four positioners for actuators go bad at their facility happened to have exactly four positioners in their attic stock, as prescribed and ordered by Omni. Eight more were immediately reordered. Another time, a temperature transmitter and a starter kept in stock were instrumental in saving a client's commissioning schedule by three weeks.

To find out how Omni can help you set up a supply of critical spare parts, contact us at 908-412-7130.