HVAC/R • PROCESS COOLING • BUILDING AUTOMATION

TECHTALK

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Restoring Control: How MSC Resolved Critical TAB and Commissioning Issues on Laboratory Renovation Project

After numerous issues arose during the final testing, adjusting, and balancing (TAB) phase of a large laboratory facility renovation project, widespread finger-pointing became rampant. When no progress could be made in identifying and correcting the problems, MSC was called in to help get the TAB and commissioning process back on track.

The facility's new laboratory space consisted of a common clean corridor that adjoined with a large office space. The corridor's ten process suites were difficult to control and in constant alarm.

The service technician and engineer MSC dispatched to the site began their diagnostic process with a physical inspection, and they found that numerous architectural finishes hadn't been sufficiently sealed to maintain a pressure cascade. Multiple door sweeps required height adjustments, and we noted various joints and crevices that were lacking sealant.

Once these repairs were underway, we determined that the corridor lacked a differential pressure transmitter (DPT) reading from a neutral reference. As a temporary remedy, we installed a Dwyer static pressure sensor outside the building from which to establish a steady corridor pressure of -0.05 inches of water column (WC). We advised that a permanent static pressure sensor be installed.

With the neutral reference point in place, we turned our attention to the differential pressure transmitters. We discovered that the selected DPTs were not rated for very low differential pressure, and as a result, they were recording inaccurate values and continually reporting false alarms. The DPTs were replaced with robust new instruments properly rated for the low-pressure application to provide accurate, repeatable DP readings between the corridor, airlocks, and suites.

We also inspected and tested all of the pneumatic fittings, revealing numerous leaks, one line that was cracked, and kinked tubing in several recessed static pressure tips. These issues were repaired and successfully pressure tested.

After the clean rooms, airlocks, and doors had been properly sealed and the new instruments were in place, we moved on to setting the pressure cascades between the common corridor, airlocks, and

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Static Pressure Diagnostic Solutions on Lab HVAC Commissioning and Start-Up

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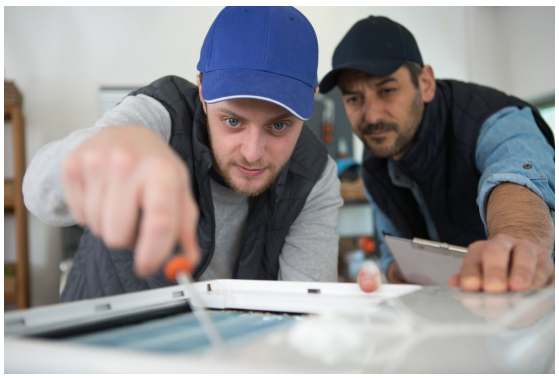
process suites. All VAV boxes on both supply and exhaust were tested, airflow-checked, and fine-tuned to maintain proper DP. We also discovered numerous automatic doors that were staying open too long or not fully closing against the air pressure, causing rooms to go into full-exhaust mode and triggering alarms.

Our team then set about installing NIST-traceable data loggers to measure differential pressure, temperature, and humidity throughout the space. We identified several loop-tuning errors as well as a number of actuator positioner problems. We worked with the BAS contractor to correct these issues and verify and test the sequence of operation.

Finally, with the system properly balanced, we individually tested all of the airlocks and process suites. This was followed by an uninterrupted 72-hour test that proved the system was accurately maintaining all required parameters with no anomalies, allowing our client to close out the commissioning effort.

Turning the Tide: A Positive Shift in Skilled Labor Enrollment Trends



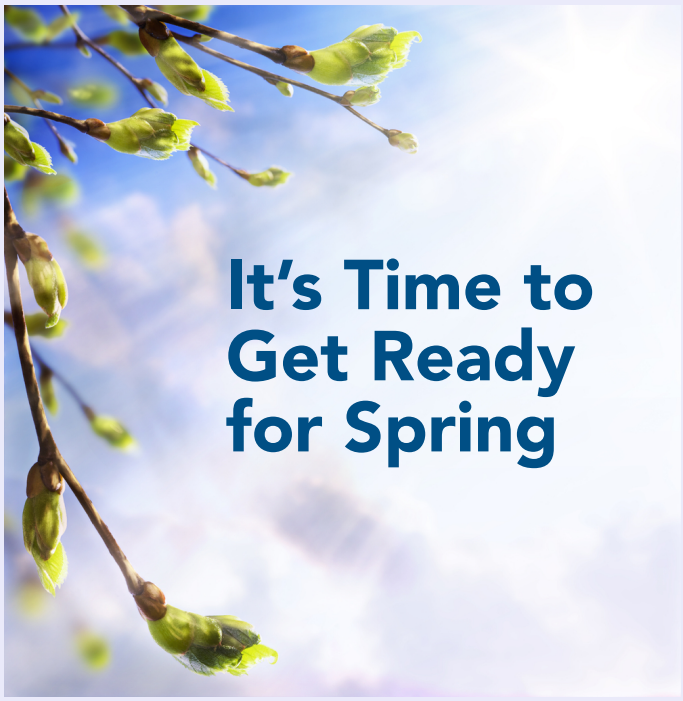
In 2022, MSC published several articles addressing the persistent issue of the skilled labor shortage, joining a series of commentaries we've written on the subject over the past 15 years. Unlike earlier articles, our most recent article, "HVAC Service Technician is an Excellent Career. The Challenge is Convincing People", concluded on a cautiously positive note, suggesting the possibility of a trend reversal in the near future. We wrote that, with widespread labor shortages dominating the news and an ongoing push in diverse industries to destigmatize and diversify skilled trade career paths, "Perhaps there is hope on the horizon."

Now, emerging trade school enrollment trends lend weight to that perspective.

Research from the National Student Clearinghouse showed a surge in enrollment across various construction trades programs from spring 2021 to spring 2022, with a robust increase of 19.3%. Similarly, mechanic and repair programs experienced an 11.5% uptick, while culinary programs rose by 12.7%. During the same period, overall enrollment declined by 7.8% at public two-year colleges and 3.4% at public four-year institutions.

Trade school enrollment continued to make steady gains, increasing by 6% between 2022 and 2023.

While it's clear that the skilled labor shortage remains a pressing concern that is far from over, these statistics indicate a shift in the right direction. Increasingly, young people are recognizing trade schools as a viable and financially prudent pathway to a fulfilling career, unburdened by crippling debt. Hopefully, this growing acknowledgment of the value and potential of skilled trades heralds a brighter future where individuals and industries can thrive.



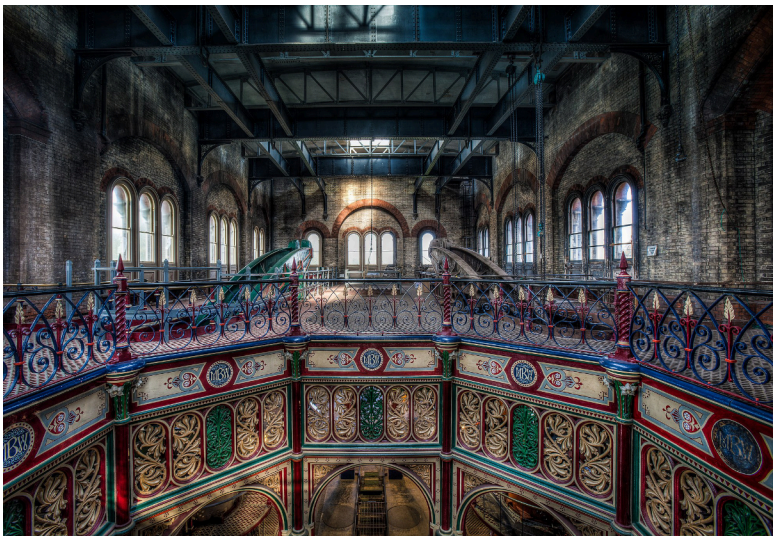
It's Time to Get Ready for Spring

The new season is almost upon us, and it's almost time to switch over from heating to cooling. This means replacing filters and cleaning evaporator coils, condensing coils, and drain pans. Cooling towers and water filtration systems should be readied for the season with a round of thorough cleaning and testing. Flush and blow out chilled water systems and clean strainers; the same goes for reheat hot water systems. Check all DX systems for refrigerant leaks.

Spring is also a time to take advantage of warm days and cool nights, so make sure economizer cycles are programmed correctly. Lastly, verify that all systems are operating to design intent to save energy and ensure maximum equipment life.

Cathedral on the Marsh: Inside London's Grandiose Crossness Pumping Station

During the first half of the 1800s, London was plagued by a series of cholera outbreaks that claimed thousands of lives. The sewer system was overburdened by a growing population, and untreated waste overflowed into gutters and waterways unchecked. The breaking point came during the sweltering summer of 1858, infamously known as The Great Stink, prompting city officials to commission the construction of a new sewage system. The resulting 82-mile network of pipes culminated at the elaborate Crossness Pumping Station on the south shore of the River Thames.



The steam engine was vital to British power and prosperity during the 19th century, which shows in the visual extravagance afforded to Crossness. Nicknamed the Cathedral on the Marsh, the station was adorned with intricate, colorfully painted ironwork, polished brass, grand columns, and ornate stone carvings. Four massive steam-powered beam engines, each featuring a 52-ton flywheel and a 47-ton beam and fed by twelve boilers consuming over 5,000 tons of coal each year, pumped sewage into a 6-acre reservoir, where it was held until being released into the ebb tide to be carried out to sea.

Crossness Pumping Station was the first of its kind in the world, and it remained in operation until it was decommissioned and abandoned in the 1950s. Its historical and architectural significance was recognized in the 1980s, and the station was restored by the Crossness Engines Trust over the next 30 years. It is now open on Sundays for guided tours, during which one of the original pumping engines, the Prince Consort, is run under steam. A video of the Prince Consort in operation can be viewed here.