

Research Facilities Keep Pace With Fast Growing Company

Albany Molecular Research, Inc. (AMRI)

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David Coon
Facilities Director
Albany Molecular Research, Inc. (AMRI)

Background

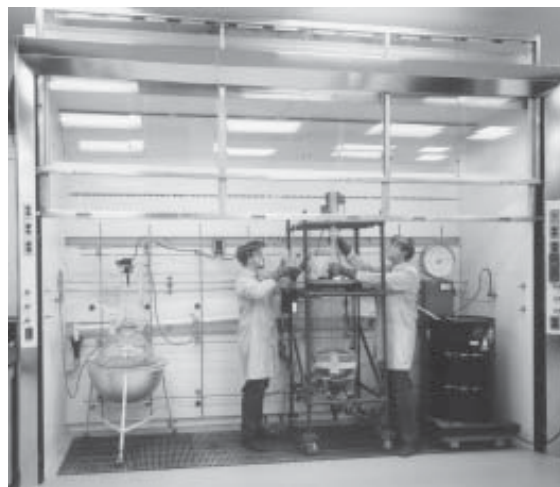
Albany Molecular Research (AMRI) is a chemistry-based, drug discovery and development company working with pharmaceutical, biotechnology and life sciences organizations. Since its founding in 1991, the company has experienced remarkable growth and considers itself a premier provider of comprehensive chemical research and development services. It has twice been named by *Inc* magazine as one of the fastest growing firms in America. Also in 2000 and 2001, *BusinessWeek* rated it #2 and #7 respectively in the Hot Growth Companies list.

AMRI is continually expanding to meet the needs of its customers and now operates more than 350,000 square feet of laboratory and office space spread over five locations. Keeping pace with this growth is a challenge that keeps facilities director, David Coon, and his staff quite busy. David draws upon his 20 years of experience constructing and managing pharmaceutical facilities. He also taps the expertise of Friedman-Fisher Engineering to design the optimum mechanical systems. Together they have devised a phased expansion program and

standardized a laboratory ventilation system design that works.

The Challenge

The ventilation requirements of laboratory facilities are complex compared to other building types. In this type of application, the ventilation system is the primary safety shield, not only for researchers working at the fume hood, but also for all building occupants by preventing noxious fumes from migrating outside the lab. Maintaining proper room pressurization requires that the total exhaust and make-up air supply always be balanced. In addition to safety, comfort must also be maintained in spaces that require conditioning a continuous supply of outside air. “The airflow tracking system we apply in these facilities is rooted in understanding that the laboratory



This large, walk-in fume hood is one of many types of devices the Celeris® system monitors and controls.

fume hood is both a safety device and an integral part of the HVAC system,” observed Brad Fisher, principal of FFA.

The energy costs for operating a laboratory facility are quite high due to the ventilation requirements. In considering controls for the laboratory workstations, the company’s management wished to explore options for reducing energy consumption. System payback was an important consideration as well as the ability to integrate with the building management system to track operating performance and monitor energy costs. Additionally, the system would have to be flexible to accommodate future modifications.

Aside from the mechanical system criteria, producing state-of-the-art research facilities is key to AMR’s ability to recruit and retain top scientists. Keen competition exists in this area and David Coon often benchmarks his facilities against others to ensure that AMR is among the best.

The Solution

Based on his experience, David wanted to install a variable air volume (VAV) system for safety reasons and its ability to generate good payback on energy savings. Concurring with his client on the selection of a VAV system, Brad Fisher specifically recommended Phoenix Controls. According to Brad, VAV represents the most logical approach for this type of application, producing a pressure independent system by varying the exhaust and supply. It was known from the outset that the expansion plans would require continual modifications to the air handling system, making flexibility a necessity.

To provide the most modern technology available, the later phases of expansion specified the digital Celeris® system for laboratory ventilation by Phoenix. Both the earlier analog system and Celeris are fully integrated with the Johnson

Controls Metasys® DDC system using BACnet® gateways.

Additional options for improving energy consumption have also been implemented. Many individual hoods are connected through manifolds to a large mixed flow dilution fan system on the roof, and Friedman-Fisher suggested applying heat recovery coils in the exhaust and make-up air handling units.

Phoenix valves are controlling the flow for a variety of laboratory exhaust devices. In addition to the standard bench top fume hoods, there are several walk-ins, including a custom-manufactured 14-foot fume hood, and numerous snorkels and biosafety cabinets. All the exhaust flows for each room are tracked through the Celeris system, summed and the correct amount of supply air provided to maintain proper room pressurization. The sophisticated control system ensures that proper ventilation rates and temperature are controlled within prescribed limits.

The Result

The bulk of the laboratory expansion was divided into four stages and spaced over five years (see the table below).

All phases of construction and renovation occurred without impacting the operations of the existing laboratory facilities. Work was scheduled aggressively and completed on time. The design and construction team included the owner, the engineer, and contractors who all worked

together to achieve these results. Even with good communication and coordination, the normal hold up at the end of any complex mechanical system project is usually the controls commissioning. The Phoenix system has always come up quickly and hassle-free.

Commenting on the changeover, David, declared “I would never go back to using a constant volume (CV) system. I realize that some people believe that the complexity of VAV translates into a lot of maintenance, but I have not found that to be true.” Maintenance has been negligible and the payback on energy savings real. One of the older, existing buildings still using CV averages \$4.20/square foot to operate, compared with one of the newer VAV laboratories averaging \$2.00/square foot.

From the design engineer’s point of view, Brad Fisher notes, “We have found the Celeris system very flexible when it comes to custom applications and sequences. We use high and low flow positions for glass wash station slot hoods, and a more classic VAV sequence for writing and staging areas to help us gain flow diversity while still maintaining temperature and pressurization control.”

From the facilities director’s perspective, David concluded, “The controls are great for cGMP reporting, tracking temperature and pressure.” As for Celeris, he believes that it produces a tighter degree of control.

Phase I —Retrofitted original constant volume labs with variable volume controls. Constructed new laboratories requiring new air handling unit, exhaust fans, boiler and chiller.
Phase II —Added large new development lab plus the first cGMP suite; added second air handling unit.
Phase III —Major expansion included 60,000 sq. ft. of labs, four cGMP suites and a new central plant.
Phase IV —Eight workstations added on first and second floors; supply and exhaust systems modified.