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Radiant Works AROUND THE CLOCK For Critical-Time Delivery Service

When every second counts, who wants to worry about shoveling snow?

Radiant Works AROUND THE CLOCK For Critical-Time Delivery Service

by Steve Smith

So what do you do when positively, absolutely overnight delivery just won't cut it?

Move over, FedEx. AirNet Systems Inc. is the nation's leading specialist in critical-time air delivery business. With less than 1,000 employees, AirNet is much smaller than FedEx, but they're geared for faster, more nimble service.

The company's fleet of 130 aircraft — based in Los Angeles, Seattle, Boston, Tampa and other cities all over the country — fly more than 600,000 miles weekly, guaranteeing that if tomorrow is just too late, their same-day service will get the delivery there today — anytime, anywhere, coast-to-coast, seven days a week, 365 days a year.

AirNet delivers hearts on ice to dozens of transplant patients, but also special ops experts to unscheduled meetings with the president. Rare animals to zoos. Radioactive payloads. CEOs and a Hollywood star or two. All transported readily to thousands of locations nationwide.

"It's demanding work, and business is good," says **Joel Biggerstaff**, AirNet's chairman of the board and CEO.

When AirNet made plans to grow its Columbus, Ohio, hub facility, one of the first decisions was to design a new hangar. It would need to accommodate growth,plus be comfortable, energy-efficient and highly functional.

Comfortable. Energy-efficient. Highly functional. They all sound like good descriptions of radiant

All arteries of the extensive heating system lead to and from the strategically-located mechanical rooms, where, at the heart of the system, are two stacked 1.5 million Btu, fan-assisted, sealed combustion boilers.

heating and snowmelting. One of the key enhancements to the new facility is the extensive radiant heat and snowmelt system installed by Columbus-based Muetzel Plumbing & Heating Co. for the immense hangar.

"The rapid pace that AirNet's people work at is stressful enough," says **John R. Muetzel**, president of the 35-year-old mechanical contractor. "Warm floors and heat that would also gently warm the aircraft was perfectly suited to the need."

The new $25 million facility opened last spring after two years of construction, enabling AirNet to consolidate the operations of three smaller facilities and to relocate its operations from Columbus' main airport to Rickenbacker International,about 15 miles south of town.

The new 148,000-sq.-ft. facility also doubled AirNet's former hangar space, which permits larger aircraft to be loaded and unloaded inside and provides valuable sorting space to ease congestion under one roof.

With large sliding doors, and the possibility of more than one of them being opened at one time,heat within the facility would be lost quickly.

"With radiant the recovery time is fast, and most of the heat stays in the high-mass floor, and everything stored on the floor — the aircraft and stacked cargo, for instance," Muetzel adds. "For an application like this, radiant's the only way to go."

Great Size: Radiant system planning and design for the enclosed space began many months before installation. Because of the floor's great size, Muetzel (who especially enjoys piping layout and design), and experts from the project's general contracting firm, Ruscilli Construction Co., as well as **Hanse Cromer**, a heating expert with Steffens-Schulz, a manufacturers rep firm in Columbus, Ohio, settled on a plan that would create four separate, 13,125-sq.-ft. slabs, each measuring 75 feet by 175 feet.

For the extensive one-zone, seven-manifold system, the radiant design team used 55,000 lineal feet of 3/4-inch RadiantPEX tubing from Watts Radiant. The system was designed to provide up to 25 Btus per sq. ft. Each slab would have accessible, recessed sensors and the entire system would be responsive to outdoor reset controls.

And, outside the hangar's four large bay doors, Muetzel crews also installed tubing for 10,000 sq. ft. of snowmelt under the concrete slab to streamline maintenance of the area immediately beyond the doors, and for easier maneuverability of taxiing jets and planes, even in the midst of winter's worst.

All arteries of the extensive heating system lead to and from the strategically located mechanical room where, at the heart of the system, are two stacked 1.5 million Btu, fan-assisted, sealed-combustion Pennant boilers by Laars Heating Systems Co. The new units operate at 85 percent combustion efficiency and offer four-stage control to meet demand as needed, providing considerable energy savings.

The larger Pennant 1500 models used at AirNet included two ignition modules, with each burner stage firing independently of one another. This design offers balanced air flow to each boiler's four firing stages, enabling operation as individual boilers. This also permits each unit to continue operation without having to shut down the entire boiler.

"It's like having a greatly simplified lead-lag heat source," Cromer explains."If there would be failure of one of the ignition systems,the other takes over. That became a key factor in choosing the systems."

The system was designed so that, at full heat load, all eight stages of firing would be used.

"Because the fully automated idling radiant and snowmelt system would be in some stage of operation throughout the entire winter season," Muetzel adds, "we pretty much eliminated the possibility of some unexpected winter condition catching them by surprise."

For this one-zone, seven-manifold system, the radiant design team used 55,000 lineal feet of 3/4-inch PEX tubing.

Single Sensor: The single floor sensor, embedded in each of the four large slabs, and snowmelt controls, are handled by a HeatTimer microprocessor control. The system was set to maintain a floor temperature of 80-82 degrees F. The technique was chosen because of the large opposing bay doors. Since the doors would occasionally be open at the same time during the winter season, it would be difficult to maintain a specific air temperature.

The digital control also monitors outdoor temperature and, at 36 degrees F, the snowmelt system is activated. The control is coupled with a three-way motorized valve. By design, the valve opens slowly until a prescribed supply-and-return differential temperature is achieved. The gradual mixing of heated glycol solution into the snowmelt tubing prevents thermal shock to the slab.

The 40/60 mix glycol snowmelt system was separated from the main indoor heating system through the use of a shell-and-tube heat exchanger. An outdoor-reset system sets system temperatures. For the most part, the hydronic system is set to idle throughout the winter months, with programmed instructions to keep outdoor slab surface temperatures at a steady 35 degrees F.

There are seven bay doors, all of which roll on heavy steel rails. Two of the hangar doors have snowmelt areas that extend outside.

"We were especially attentive to the need to melt any snow or ice around the door's base rail," Muetzel says. "AirNet needed to open and close the doors quickly without interference."

There are also snowmelted areas beyond the other bay doors, areas where cargo is loaded inside and then transported by conveyor belts to loading areas outside. From these heated pads, cargo is then loaded onto carts for movement to the aircraft.

For Muetzel Plumbing & Heating Co., the AirNet job extended over a period of about 10 months. Its role included hydronic installations, radiant heat and snowmelt, and placement of an extensive drainage system for the hangar area.

Piping was placed for 20 6-inch floor drains that feed into a 20-inch PVC main. The drainage system was sized to meet the need of the hangar's vast fire-suppression system, which is always ready to dump high volumes of water-based foam should there be an emergency.

But the only emergencies that AirNet is contending with these days are the rigors of getting packages and people to distant places, when — as its slogan goes — "every second counts." *PM*