

Improved Surgeon Comfort and IAQ Northeast Baptist Hospital San Antonio, Texas

The Baptist Memorial Hospital System operates four major facilities in San Antonio, Texas. In late 1992, construction planners began a project to improve the HVAC system which serves the operating rooms at the Northeast Baptist Hospital.

The air conditioning system had become the source of complaints from the surgical staff in recent years, as surgical procedures began to require lower operating room temperatures. As the planning began, however, it became apparent that reconstructing the system would be a major challenge. The demand for surgical services at Northeast Baptist is very high. Any schedule disruptions would be quite costly, so construction interruptions had to be kept to a minimum.

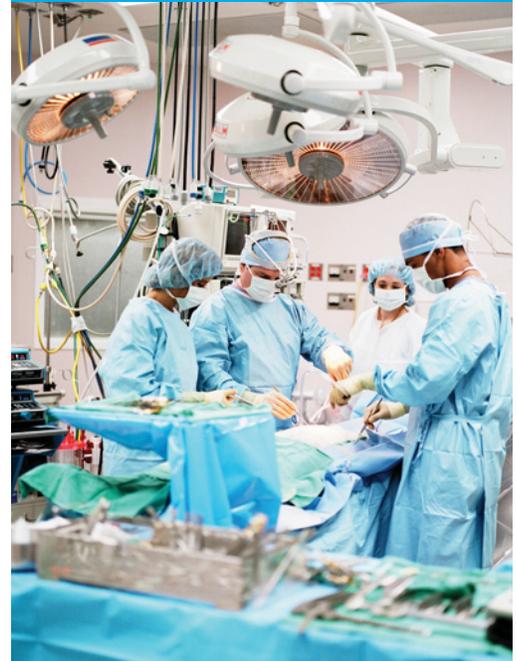
The Problems

In the 20 years since the original HVAC system began operation, surgical practice has undergone several major change which increase the burden on the cooling system. Advanced procedures require the surgeon to spend longer periods in the OR. Increased power consumption from lights and electronic monitoring equipment has more than doubled the sensible heat load. At the same time, surgeons must gown more heavily to avoid the hazards of diseases such as HIV which are transmitted through exchange of body fluids. All of these changes require more cooling, so surgeons need room temperatures of 62 to 64°F instead of the 70 to 72° that was common years ago.



At Northeast Baptist Hospital, a MDAire desiccant system allowed major improvements in comfort control for the operating rooms. The entire project was completed without a single interruption of surgery schedules.

DryCool Case Study: Northeast Baptist Hospital



FACTS

By installing the MDAire System, Northeast Baptist Hospital has:

- 50% rh at 62°F
- No Lost Revenue
- Independent Control for Each Room
- Reduced Risk of Infection

During much of the year, 64°F was well beyond the capacity of the original cooling system. And at such low temperatures, humidity frequently exceeded the 60% rh maximum required by State licensing authorities. Clearly, the HVAC system needed improvements.

The Solution

While it would have been possible to redesign for better humidity control with a cooling-based HVAC system, that alternative would have required installing special equipment and return air ductwork, which would have halted surgical procedures for two months.

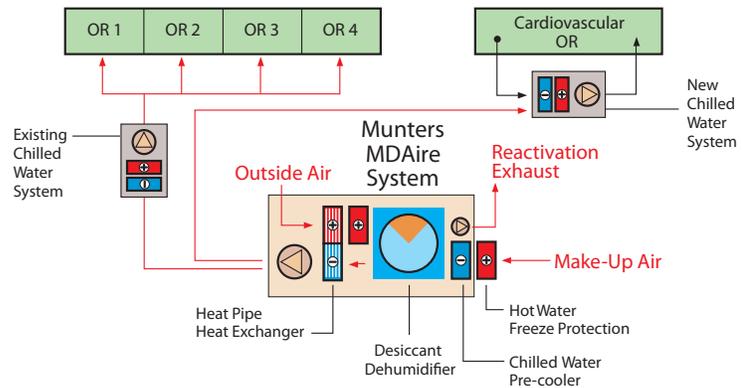
Instead, Paul Allen, the architect for the Baptist Hospital System, installed a MDAire desiccant system on the makeup air to control humidity, allowing the cooling system to do a better job of controlling temperature. By not disturbing the existing cooling system, interruptions were avoided entirely.

The MDAire system dries 7,300 scfm of fresh air from a moisture level of 100 gr/lb to a level of 40 gr/lb, removing more than 280 lbs. of water from the air every hour. That allows compliance with the 50% rh guideline even when the room temperature is 62°F.

Each surgeon can set the room temperature he or she requires. The humidity is held at 50% rh automatically, without affecting conditions in adjacent rooms. This is accomplished by drying the air for all rooms to a low level with the MDAire system, then re-humidifying any



Because the MDAire system was installed on the roof and connected at the fresh air inlet, it was easy to retrofit and upgrade the old HVAC system without interrupting normal hospital operations.



By drying the fresh air with a desiccant wheel, the MDAire system ensures 50% rh even when room temperatures must be held at 62°F.

individual room that needs above-normal temperature or humidity.

The installation was done in stages, so surgical operations would not be interrupted. Posts were welded to the tops of existing interior columns to carry the weight of the unit from the roof down through the building structure. A small amount of interior construction was required, but only in one surgical waiting room. Then the MDAire system was placed on the roof above the new support posts, and all power and chilled water connections made up to the unit. The final connections to the supply air duct work were made during a four hour period.

The MDAire System

The MDAire system is an integrated rooftop package, including desiccant wheel, filters, chilled water precooling heat pipe post-cooling and all controls.

The desiccant wheel is made of a semi-ceramic material, and is impregnated with finely-divided silica gel. The wheel rotate very slowly—one revolution every eight minutes. A high-efficiency direct-fired gas burner or steam energy reactivates the desiccant continuously.

After the dry make-up air leaves the desiccant wheel, it is cooled by a heat pipe. That heat is moved to the reactivation air stream where it helps to reactivate the desiccant.

BENEFITS

- **50% rh at 62°F**
The MDAire desiccant system allows comfortable working conditions at today's lower operating room temperatures. And MDAire allows compliance with hospital humidity requirements even when temperatures must be kept at 62°F.
- **No Lost Revenue**
Because the MDAire system is placed on the make-up air inlet, all installation was completed without halting surgical operations. This saved tens of thousands of dollars normally lost during construction interruptions.
- **Independent Control for Each Room**
Each operating room can be controlled independently, so there is no need for one procedure to suffer from the different temperature or humidity requirements of another.
- **Reduced Risk of Infection**
Because the HVAC system runs at low humidity, there is less water available to support the growth of bacteria and fungus that normally thrive in ductwork. This complies with ASHRAE Standard 62 and reduces risk of infections produced by the air conditioning system.

The system also includes a programmable controller equipped with a modem for dial-in query and adjustment. The MDAire system is on the roof, but the maintenance staff can monitor and adjust its functions with a personal computer in the maintenance office, which is located in a separate building.

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