

Emergency Cooling System Options*by John T. Watts P.E.*

Thorough planning and good communication can result in the successful implementation of an emergency cooling system with relatively minimal cost to the facility.

Saving money is the primary reason to maintain space conditions

It is the facility manager's responsibility to know which areas of the facility are important for maintaining space temperature and/or humidity levels at predictable times.

One of the biggest reasons for providing emergency cooling options to certain areas of a facility is money, or the threat of losing money. A good example of the threat of loss of money is in the pharmaceutical production industry. The Food and Drug Administration (FDA) regulates the clean production areas of these facilities. If air conditioning equipment failure occurs and the cleanliness of the production areas is not maintained, production time and money is lost until the FDA can approve the cleanliness of the production area. This industry will typically provide emergency cooling systems along with the normal cooling systems.

Some facilities can not justify the need to provide a separate emergency cooling system along with the normal system. Options for these facilities would include providing small emergency cooling systems for only the most important areas or to provide connections for portable cooling systems. Some facilities utilize the ability to provide emergency cooling as a marketing feature to attract tenants. This provision may allow a tenant to have some cooling during emergency operations.

There are several approaches that can be taken in order to meet the emergency cooling needs of a facility. The best way for a facility manager to ensure proper emergency cooling options are implemented is to review the emergency system operation and function with a Consultant/Engineer. There are several viable options however, it is important to carefully evaluate each facility before determining which system will provide the best fit.

The first step in the design of an emergency cooling system is to identify those areas that must be properly cooled in the event of the air conditioning equipment failure. Consider areas that are important not only to your facility, but also may be important for your

tenants. Once these important areas have been determined, the next step is to evaluate the level of cooling required to maintain the emergency space conditions.

The facility manager should understand emergency cooling system. This system should be verified for proper operation. This verification should include the maximum length of emergency operating time and the space set points for the emergency conditions. It should be helpful to note that some equipment can operate at higher space conditions for a limited amount of time without damage to the equipment. All equipment is different and the equipment manufacturer should be contacted for temperature range and amount of time.

Load Capacity and Cooling

It is important to note that the load requirement for the important areas should be sized for the emergency cooling load requirement. Air conditioning equipment, especially smaller equipment, may not operate correctly if the equipment cooling capacity is substantially larger or smaller than the heat produced in the space. The oversized cooling equipment can operate in short cycles of cooling which can create an environment with high humidity. Also, larger air conditioning equipment can use more energy and larger air conditioning equipment typically costs more to rent.

In emergency situations, there are several directions that can be taken to condition your important area. If you need to maintain space conditions at all times, a good option is to provide redundant cooling along with the normal cooling as part of the original construction or renovation. For example, most wireless communications computer centers are designed with 100 percent cooling redundancy.

If your area is a small portion of your facility, providing space and power for a small portable cooling unit can be a viable solution. Examples of this option are providing a small water-cooled or air-cooled chiller that is sized for emergency cooling or a small self contained air conditioning unit which can be placed in the important area and plugged into the wall outlet.

Another option for emergency cooling is to provide a means to connect mobile cooling equipment to supply your facility during an emergency. Installing chilled water taps for the chilled water system can be a very simple and cost effective option of emergency cooling. This option will require an emergency action plan addressing who to contact to obtain the equipment and how long will it take for the equipment to be setup and operational.

Utilizing thorough planning and good communications can result in a successful emergency cooling option which addresses both the facilities needs and budget and allow the facility manager to address other opportunities.

