

2003-2004 History Paper
Mississippi Chapter ASHRAE

“A Forgotten Art”

Refrigeration is the focus for ASHRAE this year. It seems to me that HVAC refrigeration design has become a forgotten art. In today's world of package, self-contained, pre-engineered systems the art of sizing and designing unique and custom refrigerant bases HVAC systems is a thing of the past. That's why I was so intrigued when I stumbled onto the system I am about to tell you about.

The system that is the subject of this paper is a Constant Volume Direct Expansion System. This system uses three (3) 75-ton open drive-reciprocating compressors with remote condensers. These three (3) refrigerant circuits are connected to a bank of cooling coils each with four (4) distributors giving the system a total of twelve (12) steps of cooling. This amount of capacity control is unheard of these days. The fan for this system is a huge airfoil fan delivering 99,815 CFM of air to the space. Duct mounted electric reheat coils provide heat for the system. Of course there is one huge bank of filters prior to the cooling coils.

Probably the most interesting characteristic of this system is that the building was designed and constructed around this system. The room that houses the compressors, refrigerant piping and controls is a room designed specifically for their installation. The Air Handling Unit, as described above, essentially is a concrete room with access doors. These access doors are man sized steel doors that allow access to the filter bank, between the filters and coil and to the fan section. The drain pan for this unit is actually a concrete sump that the coils sit in.

The system that I have been discussing was originally installed in a K-Mart in Jackson, MS in 1972. This makes the system about 32 years old and that may

not seem very old to some but in light of its size and its design, I felt it worthy of discussion. The system is still operating flawlessly today although the building is no longer occupied by K-Mart. I think it would be safe to say that very few people in the HVAC business today could design such a system.

I have included some pictures that I hope will be representative of the system. The pictures really don't do the system justice. In my opinion, it's a system that you need to see to appreciate.









