Mechanical Systems Redesign Report

Monday, December 12, 2005

Breadth Summary

The redesign the majority of the mechanical systems of the Hilton Hotel at BWI Airport have effects on some of the building's other systems. Also, the results of improving some of the other systems will directly affect the mechanical systems. The two main breadth areas for this project fit into these two categories. Changing the lighting systems will decrease the cooling load of the mechanical systems. Improving the equipment in the guest rooms and adding a chiller to the main mechanical equipment room will require acoustic studies to ensure proper performance of those spaces.

Lighting Systems

The majority of the lighting fixtures used in the BWI Hilton consist of compact fluorescent downlights. However, the designer chose to use incandescent downlights in the large and small meeting rooms on the ground and second floors of the building. Typically, incandescent bulbs can use more energy, give off more heat to their surroundings, and need replaced more often than compact fluorescent bulbs. For these reasons, a replacement of all the incandescent downlights in the meeting rooms will be done with compact fluorescent downlights. The effects of the bulb color rendering index, color temperature, and lumen output will be studied to ensure the redesign lighting schemes are just as good, if not better, than the original designs.

Acoustics

The WSHPs used in the original design are typically known for operating at higher sound levels than the FCUs chosen for the redesign. The effects of changing the systems will be analyzed from an acoustical standpoint. The sound pressure levels in the guest rooms will be calculated from the manufacturer's sound data. The required noise criteria (NC) in the guest rooms and meeting rooms can be compared with the actual levels found in those spaces. In addition, it can be determined if the proposed sound transmission class (STC) values for some of the interior wall types are adequate. Evaluation of the new chiller acoustic behavior is also an important topic to cover.