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Energy Conservation through Building Automation Systems

A well-planned and properly utilized building automation system helps maintain a building at optimum efficiency, lowers operating costs, enhances comfort levels, increases productivity and maintains a quality building environment. When properly documented, the energy system and resultant operating savings can dramatically increase the value of the building to prospective buyers, possibly increasing its worth beyond the cost of the BAS. Conventional building control strategies address all of these issues by introducing the energy control concept within our industry. Secondly, an overview of energy conservation strategies applicable to building automation system will be presented. The following is a general description of these strategies.

Day / Night Mode
This energy conservation measure involves changing the operating mode of the entire building between day mode and night mode for all days of the week.

Occupied / Unoccupied Mode
This strategy involves changing the operating mode of a specific zone in the building between occupied mode and unoccupied mode. This may be performed manually or more preferably, on a timed or sensed basis, which eliminates the possibility of human error.

Equipment Interlocks
The building automation system can save energy and utility costs by forcing equipment to either operate or to stop operating when certain designated primary equipment is operating. This has several advantages including the reduction or elimination of power demand peaks, upon which the building owner is penalized.

Duty Cycling and Demand Limiting
Duty cycling rotationally turns this equipment off as required to meet a user-defined energy savings target. Duty Cycling works in conjunction with the Demand Limiting feature. Together, these two features use a common set of loads and an integrated load shedding logic to reduce utility charges. Duty Cycling is most effective when it is used in conjunction with Demand Limiting, which monitors power consumption, typically over a sliding 15 minute interval. The 15 minute period is significant because it is the basis for the utility demand charges. In addition, Demand Limiting compares projected demand for the interval to a user-defined target for maximum demand and selectively sheds loads (turns off equipment) to ensure that demand stays below the target. These methods of energy reduction must be carefully planned with input from the building user and be adjustable in their application to suit changing or revised requirements, such as addition or deletion of a night shift, the incorporation of a new piece of equipment, etc. They should also be reviewed regularly to ensure that they are not causing comfort or other problems in the building or space.

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