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Topic 1

Reasons why the thumb rule that every 2 deg C increase in room temperature would reduce the Kwh consumption by at least 10 % is correct.

The assumption that every 2 deg C increase in room temperature would reduce the Kwh consumption by at least 10 % might have its origin in the reported studies carried out in USA. Such studies were carried out in existing buildings. The findings of these studies have been referred in Chapter 28, ENERGY ESTIMATING METHODS, "Fundamentals Handbook" published by American Society For Heating, Refrigerating and Air-conditioning Engineers (ASHRAE). The contents are quoted below:

"QUOTE"

"Typical seasonal energy savings for residential cooling units for 1.7 degree C. temperature set-up in summertime have been reported between 15 and 30 %.

"UNQUOTE"

From the above, it appears that consultants claim of atleast 10 % reduction in energy savings for every 2 deg C increase in room temperature is justified. This claim can also be justified by the following argument:

Outdoor Design Temperature: : 42 Deg C
Inside Design Temp. : 22 Deg C
Difference : 20 Deg C

Logically since 20 Deg C cooling requires 100 % energy then if the reduced by 2 Deg C then reduction in energy consumption will be

$$100 / 20 * 2 = 10 \%$$

This logic may hold good for room air conditioners but for large Central plants the detailed calculations for possible savings by increasing the room temperature have to be carried out.

In order to exactly calculate the possible savings by increasing the inside temperaure, we have to recalculate the space cooling load and energy required for secondry equipment like AHUs, Chilled Water Pumps, Condenser Water Pumps, Cooling Tower Fans, and Primary equipment like Refrigeration Compressors etc.