ME-415- Energy Management and Planning

[Instructor: Dr. M Farooq]

CEP

Lighting is used primarily for workplace illumination, for safety, and for decoration. In some instances, improving lighting quality increases worker productivity, and can result in greater profitability for a facility since the benefits of even a small change in worker productivity can vastly outweigh the re-lamping and maintenance costs. In a typical facility, 40-watt F40T12/Workshop lamps were replaced with 34-Watt energy-saving lamps in two hundred (200) 4-lamp fixtures which are operated continuously. By considering the following data for the re-lamping EMO (energy management opportunity), calculate the following:

1. Energy Cost Savings (ECS)
2. Annual Demand Reduction and Cost Savings (ADCS)
3. Annual Lamp Cost Savings (ALCS) [Costs of workshop light and 34-watt light]
4. Total Annual Cost Savings (TACS)

Assume the following data:

- The F40T12/Workshop lamps cost $1.00 each and last for 12,000 hours.
- The 34-Watt F40T12 lamps cost $1.50 each and last for 20,000 hours.
- Electric energy costs $0.05 per kWh. The demand charge is $5.50 per kW.
- The facility is not air conditioned.

If the facility had been air-conditioned, there would be an additional savings depending on the number of hours that the air conditioning was needed. Calculate this additional savings assuming the air conditioner has a COP of 2.8.

CEP 1 covers:

Is an application of in-depth knowledge of energy management system (energy auditing)

e) It involves diverse stakeholders and needs

f) Is posed at high level with many components or sub-problems