

## Energy Efficiency

Periodic review of energy use is a practice for all top performing plants as their management is aware of the benefits of such exercise in not only cost saving but also for overall health of the plant. Even a well-designed new plant is not necessarily an energy efficient one because of the following reasons, apart from others:

- Design Margin – Margin is provided on required performance parameters for safety (e.g., a boiler feed pump or a draft fan in a thermal power plant), wear & tear during the effective life of the plant, selection of an equipment – usually a size higher than required etc.
- Off-design operation – Although a plant is set up for certain output for maximum operating period, it may run at part or overload for some of the time depending on other internal/extraneous conditions. For example, with the increase in renewable generation capacity, the thermal power stations, which were designed for base load generation, are now required to operate in peaking mode.
- Input change – A plant designed for some input quality (e.g., fuel, water etc.) may receive such resources of an entirely different quality for economic or other reasons.

Many energy saving devices are available in the market and new ones are introduced with new technological developments. However, using them without proper analysis may not yield the desired result and the investment thereof may prove futile. AEPL can participate in the energy efficiency exercise with client in the following sequence and come up with a solution best for the circumstance.

- Energy Audit – This is the first step for an energy efficiency exercise. A large plant may have many major energy consumers which affect plant output and product cost. Instead of attempting to take all of them into the ambit of the exercise, it may be prudent to divide and concentrate into areas of priority. In consultation with the plant operating personnel and the management AEPL can identify them. For each of these identified segments, operation data as available of the major energy consumption points (e.g., motor voltage/ampereage, steam/water pressure/flow rates etc. and corresponding plant output parameters) are collected. For this, AEPL prepares a check list after studying the plant system and sequence of operation. When custom data is needed apart from routine plant measurements, AEPL team can guide and participate with plant personnel for collection of such data.
- Analysis – Once the required data of plant operation is available, the next crucial step is to analyze the same for deviation from best efficiency operation zone, if any, and the reason thereof. For example, a pump may be running at overcapacity for a leaky valve somewhere downstream. An air leak in a steam condenser may reveal in the temperature data. Changing the pump, or installing a VFD, or increasing vacuum pump capacity may not be the remedy in such cases. The experience of AEPL engineers in design of systems helps in diagnosing such problems from the data itself and recommend the right solution.
- Cost benefit – Finally, AEPL can prepare with a cost benefit analysis of the recommended solution, the saving in operating experience Vs the initial investment and the break even period.

AEPL will be happy to receive enquiries from operating plants for such studies.