Another viewpoint on a timely subject from a Honeywell Engineer

Systems Analysis...Key to Improved Operations in Today's Buildings

In the building profession today, architects, consulting engineers and contractors are being challenged to use new techniques to satisfy the demand for greater comfort, convenience and economy in all types of commercial buildings.

During the past 50 years, mechanical, electrical and elevator equipment have become an increasingly larger part of the total building cost—from barely 10% in 1900 to almost 50% today.

To satisfy the demand for greater comfort, and to make maximum use of equipment, planners and designers are turning to centralization. But while centralization provides great savings, it does not assure *maximum* use of the equipment involved.

Why? Because in designing major commercial buildings, planners consider operating costs, maintenance procedures, equipment servicing and, in some cases, even expected equipment life. However, this analysis is performed in terms of designed conditions and is based upon performance criteria when the chosen equipment is *new*.

Systems analysis is needed to provide optimum efficiency after equipment is in operation

Systems analysis provides for the recording and analyzing of critical operating information. Then, it provides for starting, stopping and running all equipment with the sequencing of operation and the degree of loading that will provide optimum efficiency while supplying the exact needs of the building.

Obviously, a system analysis approach to the operations of commercial buildings involves more than merely temperature control systems, however elaborate they may be. It involves more than centralizing the operations of certain key functions. It is the determination as to which data should be obtained and transmitted to a central location where it can be analyzed for optimizing the operation of mechanical equipment. It involves determining the efficiencies and the change in efficiencies resulting from changes in loads, service attention provided the equipment, wear and tear on the equipment.

Properly engineered and applied, systems analysis provides information to:

1. Optimize key control functions.
2. Optimize starting and stopping time of mechanical equipment.
3. Optimize load control of refrigeration plants.
4. Optimize the operation of heating plants.
5. Provide necessary directions to establish service and maintenance schedules to conform to the need—rather than accomplishing this task on a routine schedule.
6. Provide directions as to the time major overhaul is more economical than operating at lower efficiencies.

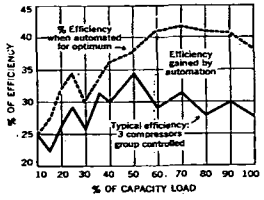

Chart shows typical example of efficiency gained by optimum control of three compressors.

Considerable savings can be realized

Because systems analysis provides required comfort or process conditions with optimum efficiency, it cuts operating costs, reduces operating manpower and decreases service and maintenance expense.

It can also extend the life of primary equipment such as refrigeration and heating plants. Better comfort conditions can be obtained because troublesome breakdowns of either temporary or major nature often can be anticipated and prevented.

Basic system requirements

Several approaches are possible to provide the information necessary for systems analysis. The key requirements of such systems are:

1. Provide the means to transmit large amounts of key data to a central location. This data must be related wherever necessary to other data. It must be taken simultaneously if the information is to have significance. The data must be related also to load conditions on the building. Load conditions, of course, may result either from external or internal changes.
2. Provide quick and accurate methods to analyze the data. The amount of data in some cases may be relatively large.
3. Provide the means by which one operator, from a central location, can take corrective action in terms of either manually or automatically starting and stopping equipment, changing control points, changing the operations of the heating and refrigeration systems, or dispatching personnel.

Necessary equipment and planning help available from one source—Honeywell

The first step in planning systems analysis is to determine whether or not it is economically justified for the proposed structure. Honeywell will be glad to work with you in determining the practicality of any installation.

The next step is to select equipment that's reliable, accurate and economical. Honeywell can supply almost all needed equipment regardless of the size and requirements of the installation. This includes:

- Sensing elements for measuring pressures, temperatures, flows, BTU's electrical power and efficiency.
- Equipment to transmit vital data with less than ¼% error.
- Data acquisition equipment to receive and log information without introducing any additional error.
- Charts and graphs that make it easy to relate data received to optimum operation of equipment.
- Equipment to start and stop systems and make necessary control adjustments.
- Computers, when practical, to analyze data and give an operating engineer complete instructions for operating his building.

The systems engineering approach goes beyond centralization. It is truly the way to the automated building where mechanical and electrical systems perform to meet exact requirements at minimum possible cost.

What's your viewpoint?

If you have any comments, questions—or would like additional information—please write to: W. N. Wray, Minneapolis-Honeywell, 2753 Fourth Ave. South, Minneapolis 8, Minn.

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