With demand rising, university considers new power plant

By AARON E. KORNBLUM

Feeling the growing pains of an expanding campus, the university is considering the construction of a $30 million electric power plant as one way to meet increasing campus energy demands, university officials said yesterday.

The proposed state-of-the-art generator is one of several plans administrators are studying to satisfy the projected energy needs of the university while keeping energy costs — now $10 million yearly — under control.

Huge demands expected

Campus energy conservation measures, while somewhat effective, will not be enough to offset the huge demands expected from new campus facilities, such as the Engineering Quadrangle addition, the Center for Human Values, the Center for Jewish Life and the Materials Science building, university officials said.

The new power plant would simultaneously produce electricity and low-pressure steam for heating, replacing the university's existing steam boilers and eliminating the need to purchase electricity from local utilities.

Plant construction could begin within the next two to three years if university trustees and borough officials approve the plan this academic year, said Director of Engineering Mike McKay.

New energy process

The plant would use a process known as cogeneration, a highly-efficient process in which excess heat from electric power production is recovered and distributed. Approximately two-thirds of every dollar spent on electric energy production is lost in the form of heat.

In the new plant, natural gas would be used to boil water into high-pressure steam, which would be fed into a turbine to produce electricity. The resulting low-pressure steam would then be fed into existing pipes to heat campus buildings.

Currently, the university burns natural gas to produce low-pressure steam for heating, and purchases electric power from Public Service Electric and Gas of New Jersey.

Cogenation is not new to Princeton. Until 1960, the university employed the cogeneration process to produce electricity using two turbines in the basement of Dilon Gymnasium, said vice president of facilities Eugene McPartland.

Under the old system, high-pressure steam was sent to the Dillon turbines where electricity and low-pressure steam were produced, McPartland explained. The system was disconnected as university demand exceeded production capacity.

According to the Cogenation & Independent Power Coalition of America, cogeneration currently provides seven percent of the total U.S. electricity produced and should reach 15 percent by 1995.

Overall, cogeneration now provides 80 to 90 percent of foreign energy requirements with further expansion expected. Cogenation is used primarily for large sites having readily available and abundant sources of low-cost fuel.

Conservation measures which have been implemented by the university include adding insulation, replacing underground steam lines and windows in a number of buildings, McKay said.

The campus heating and cooling systems, which serve approximately 110 and 60 buildings respectively, are controlled by the Energy Management System, a computerized network which serves as a watchdog for building services officials.

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Blast from the future: How cogenerators work

Power demand rises; officials consider solutions

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Technicians in the EMS nerve center can control the temperature of any campus building — from the Graduate College to the Engineering Quadrangle — though many facilities have internal thermostats which operate independently on a daily basis.

One of the first systems of its type installed on a college campus, EMS was installed in the late 1970s as energy prices skyrocketed. It was originally the "energy-intensive" buildings to utilize heating and cooling systems.

The heating and cooling distribution system, in which utilities are generated at a single location and distributed to many locations, is common among college campuses, McKay said.

"We can heat the entire campus with a crew of two people watching over three boilers," McKay said. "It's much more efficient than having boilers in every building and hiring people to watch over all of them."

The cost of new, more efficient boilers — between $1.5 and $2 billion each — makes their purchase an unattractive investment, McKay said.

While the debate continues over how to best meet the growing demand for energy, the fact that energy demand is increasing generates little debate.

"There's no question there's a creep in electrical growth on campus," McPartland said.