



TO: Planning and Budget

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DATE: March 20, 2009 for April 1, 2009

AGENDA ITEM: 5

ITEM IDENTIFICATION:

Utilities Infrastructure Renewal for the St. George Campus

JURISDICTIONAL INFORMATION:

Pursuant to Section 4.2.3 of its Terms of Reference, the Planning and Budget committee recommends approval of projects with a capital cost.

PREVIOUS ACTION TAKEN:

None

HIGHLIGHTS:

The continual growth of research activities on campus has put a strain on the existing electrical distribution system that supports both the laboratories themselves and the cooling systems needed to keep them operating. New buildings necessitate the extension of district energy systems to supply heat and cooling. Back-up electrical generation capacity is needed so that, in the event of a widespread power failure, a significant portion of the campus needs beyond life safety systems, can be isolated from the municipal power grid and met by the generation capacity already on campus.

This program can be broken down into five projects:

1. Renovations planned for the Ramsay Wright Building will increase the electrical loads from air conditioning and research equipment. To remedy this situation its neighbour, Sidney Smith Hall, will be re-fed from the Toronto Hydro infrastructure buried under St. George Street, freeing up capacity for Ramsay Wright. The estimated cost is \$2 million.



2. The construction of a new electrical feeder from the University's system to the Medical Sciences Building. This will allow MSB to be separated from the Sandford Fleming Building feeder loop, making more power available to both over-subscribed buildings. The Galbraith Building, which is also at capacity, can be sub-fed from Sandford Fleming. The estimated cost is \$5 million.
3. The chiller plant that serves most of the Medicine and Engineering buildings is not able to provide sufficient capacity during the hottest parts of the summer. An additional chiller and cooling tower would improve the existing problem as well as provide capacity to serve new buildings planned for this area. The estimated cost is \$2 million.
4. At the present time, back-up generators located in buildings are sized only to supply life safety systems. The 6 megawatt cogeneration plant cannot be operated during a failure of Toronto Hydro. The addition of a new 2 megawatt natural gas-fired generator at the plant would allow the operation of the cogeneration facility in isolation from Toronto Hydro and supply of power to certain areas of the buildings so that damage to buildings and research would be minimized. At the same time, there would be a small return possible from peak demand operation. The estimated cost is \$4 million.
5. Most buildings on campus are provided with efficiently produced heat from the Central Steam Plant at Russell and Huron Streets. While this plant has sufficient nominal boiler capacity to serve the new facilities that are planned to be built, bottlenecks exist in the stack size, water treatment capacity and emergency oil storage that effectively reduce the amount of steam that can be distributed. The estimated cost for correction of these issues is \$2.9 million.

FINANCIAL AND/OR PLANNING IMPLICATIONS:

In order to allow the enlargement of the research mission of the University, and the continued servicing of all facilities with reliable, efficient energy sources, a substantial capital investment is required now. The recently announced infrastructure funding programs specifically mention utilities infrastructure as an eligible expense and a request for funding has been submitted.



RISK IMPLICATIONS:

Failure of any segment of the electrical feeder loop that serves Sandford Fleming and Medical Sciences as it stands now would necessitate load shedding in order to partially supply the buildings while a full repair is implemented. After the work described above, such an emergency situation would be dealt with by relatively quick switching and no load shedding would be needed.

Without the new generator at the power plant, a widespread failure of the hydro grid such as occurred in 2003 would result in outages of all campus systems except life safety, and those would continue only as long as diesel fuel supplies remained.

While it may be an understandable situation to have insufficient cooling capacity during periods of extreme temperatures in some buildings, it is less acceptable in buildings that specialize in medical research.

Failure to remediate the underground fuel tank that provides back-up supplies to the central plant would result in the forced decommissioning of the tank under the orders of the Technical Standards and Safety Authority.

RECOMMENDATION:

Be it resolved that the Planning and Budget Committee recommends to the Academic Board:

THAT the Utilities Infrastructure Renewal program of projects be approved, at a total cost not to exceed \$15.9 million, and assuming receipt of funding from the government economic stimulus program:

- Government of Canada \$8.0M
- Government of Ontario \$7.9M