



University of Toronto TORONTO ONTARIO M5S 1A1

(OFFICE OF THE VICE-PROVOST, SPACE AND FACILITIES PLANNING)

TO: Planning and Budget Committee

SPONSOR: Ron Venter, Vice-Provost, Space and Facilities Planning

CONTACT INFO: 416-978-5515; ron.venter@utoronto.ca

DATE: November 29, 2002 for January 10, 2003

AGENDA ITEM: #4

ITEM IDENTIFICATION:

Change of Scope: Southeast Infrastructure Upgrade: Electrical Substation and Chiller.

JURISDICTIONAL INFORMATION:

Under the Policy on Capital Planning and Capital Projects, the scope of the previously approved capital project has been sufficiently altered to require re-approval by the Planning & Budget Committee.

BACKGROUND:

In August 2001, the capital project entitled: the Southeast Infrastructure Upgrade: Electrical Substation and Chiller was approved under summer authority having been approved by the Planning & Budget Committee in June, 2001. The total project cost was \$10,270,000 for the construction and installation of two elements, namely:

- a) a new electrical power substation (Southeast Substation)
- b) two new chillers in the Medical Sciences Building.

The new substation and the chillers were required to meet the additional loads of the new Center for Cellular and Biomolecular Research [CCBR] and the Leslie L. Dan Pharmacy Buildings, as well as the increased power and cooling demands of the existing facilities (historic average of 1.33% per year) and future needs within the south east corner of the campus. Concurrent with the new substation installation, the scope of work was to include some rationalization of the existing U of T internal power distribution grid (converting existing buildings to the new substation) that would have improved the utilization of the currently available power and further de-load the existing Central Substation at Russell Street.

The associated cost breakdown for this project, as approved in August, 2001, was projected as follows:

Source of Funds:	CCBR	Pharmacy	FRP/SuperBuild	Total
South East Electrical Substation:	2,354,000	1,987,000	2,149,000	6,490,000
Chiller	1,186,000	973,000	1,621,000	3,780,000
Total allocations:	<u>3,540,000</u>	<u>2,960,000</u>	<u>3,777,000</u>	<u>10,270,000</u>

The chiller component of the project is now approaching completion and the forecasted completion cost for this component alone is estimated at \$3,323,000, which is \$457,000 below the anticipated costs.

During the design stage of the proposed Southeast Electrical Substation it was established that the cost, initially estimated at \$6,490,00 had escalated to approximately \$11,000,000. The prime reason for the escalation was the revised charges applied by Toronto Hydro under their new pricing regime (\$172,000 in the budget for the Hydro connection as compared to the revised quoted price of \$1,990,000), the underestimated difficulty in building on the available sites and finally the industry escalating costs. Other options were considered to reduce costs with reference to both short-term (less than 8 years) and long-term (greater than 8 years) power usage scenarios.

These are summarized below:

For the short-term, the *expansion of the existing Central Substation* was investigated as was the possibility of making *direct connections to the Toronto Hydro* system on the basis of the same level of service (dual feeds to each building in a redundant arrangement). The expansion to the existing Central Substation was estimated to cost \$14,830,000 while the direct connections to the Toronto Hydro system were estimated at \$6,826,000. The latter clearly being the preferred economical solution in the short term.

Exploring the long-term, it was concluded that the proposed Southeast Electrical Substation would cost approximately \$17,700,000, whereas the direct connections to Toronto Hydro again reflected a lower costing, projected at \$11,800,000. The expansion to the existing Central station would remain the same at \$14,830,000 under the scenario reviewed.

Direct Connections to Toronto Hydro - Cost Allocation Projection

To implement the recommended solution will require taking loads off the current U of T power distribution grid and de-loading the Central Substation. The most economical way to achieve this is to remove the largest load through a preferred single connection. It was therefore determined that the preferred approach was to switch the Bahen Centre for Information Technology [BCIT] and the buildings fed through it, namely the Koffler Student Services Centre, Faculty of Architecture, Landscape and Design and Fields Institute Buildings off the U of T grid and directly onto Toronto Hydro. The CCBR and Pharmacy Buildings will be fed directly from Toronto Hydro as well. The allocation of the costs is projected as follows:

The associated cost breakdown for the revised project is projected as follows:

Source of Funds:	CCBR	Pharmacy	FRP/SuperBuild	Total
Southeast Electrical Substation:	2,496,000	2,106,000	2,225,000	6,827,000
Revised chiller costs	1,044,000	854,000	1,425,000	3,323,000
Total allocations:	3,540,000	2,960,000	3,650,000	10,150,000
Original Allocation:	3,540,000	2,960,000	3,777,000	10,270,000

The increased cost to address the equivalent electrical power needs is now estimated to be \$337,000. This amount will be offset by the reduced cost of the chiller installation of \$457,000 so the total cost is projected to be marginally lower by some \$120,000.

The scope of the electrical power provision component of the project has been substantially altered to deliver the service required. No southeast substation is now envisaged, since the power will be secured through a direct connection to the Toronto Hydro. In addition, other changes to the U of T power grid have been made so as to better optimize the load demands of the Central Substation on Russell Street.

RECOMMENDATIONS:

It is recommended that the Planning & Budget Committee recommend to the Academic Board approval of the following:

1. THAT the scope pertaining to the electrical power provision of the original project be modified as indicated to provide for a direct electrical connection to Toronto Hydro in preference to the construction of the Southeast Substation as planned. No change in scope of the chiller component of the project is planned.
2. THAT the allocation from the Centre for Cellular & Biomolecular Research [CCBR], and Leslie L. Dan Pharmacy Building capital project budgets be maintained at that previously approved.