Project Planning Report for the Fuel Train on the St. George Campus

I. Executive Summary

The means by which fuel is fed to the five boilers in the Central Steam Plant and the devices that control their operation do not meet the current Code as mandated by the Technical Standards and Safety Authority (TSSA). Continued operation of the plant requires a variance from the TSSA pending replacement of the existing fuel train and controls. Our plan is to complete the replacement of the non-compliant equipment over a three year period.

II. Project Background

a) Membership

Helmut Krueger, Manager-Central Mechanical Services
Boonteak Lee, Chief Engineer, St. George Campus
Jason Lum-Yip, Project Manager
Bruce Dodds, Director – Utilities and Building Operations

b) Terms of Reference

To develop a plan that will replace the existing fuel train and boiler controls phased over a reasonable period of time so as to be both achievable operationally and satisfactory to the Technical Standards and Safety Authority.

c) Background Information

The Central Steam Plant is located on Russell Street. It supplies heating to 74% of the built space on campus as well as to 84% of the built space at the federated and affiliated colleges and four external customers. The existing plant contains five boilers – two from the early 1950s with fuel and boiler operational controls last upgraded in the 1980s, two from the late 1960s with controls of the same vintage, and one from the mid 1990s. The older controls depend on pneumatic systems rather than newer, more efficient electronic systems. These obsolete older systems require parts and maintenance expertise that are now very difficult to obtain.

The term “fuel train” denotes the pathway taken by the fuel, whether it is natural gas or oil, from the source (i.e. the gas meter or oil storage tank) to the burner tip and the controls and safety devices included in that path. The existing configuration has only one protective device for each boiler (referred to as a “block-and-bleed” valve arrangement which is intended to ensure that fuel is completely shut off, even if one valve does not seal absolutely). Current codes administered by the Technical Standards and Safety Authority (TSSA) require one such arrangement per burner yet each boiler can have 2, 3 or 4 burners. Although we have received no order to comply from the TSSA, we have had to ask for a variance from them in order to continue to operate as is until the fuel trains can be replaced in as short a period of time as possible.

III. Project Description

The project will replace the components on a phased basis over three years so as not to interfere with the operation of the plant – three boilers in the first year, and one each in each of the next two years. As well, the controls will be replaced with up-to-date electronic controls as used successfully at other institutions. The work will be scheduled for the summer of each of the three years so as not to interfere with the supply of heat to campus buildings. All of the work is confined to the interior of the Central Steam Plant.

Schedule

Phase 1 (Boilers #1, 2 and 5)	- Summer of 2011
Phase 2 (Boiler #4)	- Summer of 2012
Phase 3 (Boiler #3)	- Summer of 2013

IV. Resource Implications

a) Total Project Cost Estimate

The total estimated cost for the project is **$6,138,300** which includes estimates or allowances for:

- construction costs (assuming a lump sum type of tender to qualified general contractors in the month of (date)
- contingencies
- taxes
- hazardous waste removal
- demolition
- permits and insurance
- Professional fees, architect, engineer, misc consultants, project management.
- computer and telephone terminations
- moving and staging
- furniture and equipment
- miscellaneous costs [signage, security, other]
- commissioning
- escalation

b) Funding Sources and Cash Flow Analysis

Phasing the project over three years means that available funding from the utilities infrastructure renewal fund will be sufficient to cover the expense; that is,

Phase 1	$3,142,500
Phase 2	$1,504,400
Phase 3	$1,491,400
Total	$6,138,300

V. Recommendations

It is recommended that the Planning and Budget Committee recommend to the Academic Board:

- THAT the project to replace the fuel train and boiler controls at the Central Steam Plant on the St. George campus be approved, at a total cost not to exceed $6.138 million, phased over three years with funding from the utilities infrastructure renewal fund.