

FOR APPROVAL

CONFIDENTIAL

IN CAMERA

TO: Business Board

SPONSOR: Professor Scott Mabury, Vice President, University Operations

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DATE: September 9, 2015 for September 21, 2015

AGENDA ITEM: 19a

ITEM IDENTIFICATION:

Capital Project: Report of the Project Planning Committee for the High Pressure Combustion Research Facility, University of Toronto Institute for Aerospace Studies, Faculty of Applied Science and Engineering - **Execution of the Project.**

JURISDICTIONAL INFORMATION:

Section 5.2 (b) of the terms of reference for the Business Board states that the Board is responsible for “approval of capital expenditures for, and the execution of, approved projects, as required by approved policies.”

GOVERNANCE PATH:

A. Execution of the Project

1. **Business Board (September 21, 2015)**

B. Project Planning Report – Project Scope, Total Project Cost, and Sources of Funding

1. Planning and Budget [for recommendation] (September 17, 2015)
2. Academic Board [for approval] (October 01, 2015)
3. Executive Committee [for confirmation] (October 21, 2015)

PREVIOUS ACTION TAKEN:

This High Pressure Combustion Research Facility (HPCRF) project at University of Toronto Institute for Aerospace Studies (UTIAS) is the result of a successful Canadian Foundation for Innovation (CFI) /

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Ontario Research Fund (ORF) application made in the 2012 round of Faculty of Applied Science and Engineering (FASE) submissions and awarded in 2013. Design work has been in progress since late 2013, following CaPS approval in November, 2013, to proceed with consultant selection and preliminary design. An increase in design fees was approved by CaPS in March, 2015. Recently estimated at a Total Project Cost over \$3 million, the project is being brought forward through governance for approval.

HIGHLIGHTS:

Faculty of Applied Science and Engineering supports a vibrant research community with Sustainability being one of the key research foci. Natural Environment, Urban and Industrial Environments, Infrastructure, and Sustainable Energy are included in this over-arching research theme. Engineers have long been aware of the impact of their activities on the environment, including reducing the impact of aviation pollutions, extracting natural resources and minerals, monitoring the earth from micro and nano satellites, and distributing energy efficiently.

Combustion science and technology remain one of the most challenging technological fields. The High Pressure Combustion Research Facility (HPCRF) project will provide the means to advance combustion science and facilitate the development of technologies that can revolutionize the future design of gas turbines. The anticipated advancement of gas turbine technology will directly benefit aircraft propulsion systems as well as industrial energy production. The resulting knowledge and technologies will improve the quality of life through reduced pollutant emissions and fuel consumption, and will enhance the global competitiveness of Canadian gas turbine industries.

This research facility will be accommodated at the Aerospace Building in Downsview. It will be necessary to renovate 188 nasm of existing space to accommodate a new research lab and lab support space. The project scope includes the design and installation of significant fixed equipment infrastructure to support the research activities of 2.5 faculty, 2 post-doctoral researchers, 5 graduate students, and 2 undergraduate students. The facility will be operational by August, 2016.

Secondary Effects

There are no secondary effects anticipated for the proposed project. The construction area will be isolated from other building occupants for the duration of the project and it is assumed that all existing adjacent areas/rooms will function as normal. As well, the proposed project will not impact any other projects being executed in the sector.

Schedule

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Project milestones for the proposed project are identified as:

September, 2015	CaPS Executive (Cycle 1) approval
September, 2015	Schematic design completion
October, 2015	Governing Council (Cycle 1) approval
November, 2015	Design development and contract documents completion
November, 2015	Tender award
January, 2016	Mobilization and construction start
August, 2016	Substantial completion

FINANCIAL IMPLICATIONS:

a) Total Project Cost

The total estimated project cost for the High Pressure Combustion Research Facility, University of Toronto Institute for Aerospace Studies, Faculty of Applied Science and Engineering is \$4,099,957.

To date, the expenditure of up to \$470,434 in design fees, included in the Total Project Cost, has been approved.

b) Funding Sources

The funding sources for the project are as follows:

Canadian Foundation for Innovation (CFI) funds	\$1,949,979
Ontario Research Fund (ORF) funds	\$1,949,978
<u>Faculty of Applied Science and Engineering (UTIAS) Operating Funds</u>	<u>\$ 200,000</u>
	\$4,099,957

c) Operating Costs

The current annual operating costs at UTIAS are \$180/nasm, paid for by the Faculty of Applied Science and Engineering. There will be an increase in electrical operating costs for the building directly related to the utilization of the major new experimental equipment but at this point it is not possible to estimate what that change will be as the equipment selection is not yet final, nor is the duration of running the experiments known. However, the equipment will be operated at off-peak hours to mitigate the cost of electricity used and operating costs will continue to be paid for by FASE.

RECOMMENDATIONS:

Be It Resolved:

Subject to Governing Council approval in principle of the project

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THAT the Vice-President, University Operations be authorized to implement the capital project for the High Pressure Combustion Research Facility, University of Toronto Institute for Aerospace Studies, Faculty of Applied Science and Engineering at a total project cost of \$4,099,957.

DOCUMENTATION PROVIDED:

- Report of the Project Planning Committee for the High Pressure Combustion Research Facility, University of Toronto Institute for Aerospace Studies, Faculty of Applied Science and Engineering, dated August 26, 2015.