Memo

FACULTY OF ENGINEERING AND APPLIED SCIENCE
OFFICE OF THE DEAN

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TO: Lon Knox, Secretary of the Senate

COPY: Celia Russell,
Director University Secretariat Operations

FROM: Ann Messenger, Secretary
Engineering and Applied Science Faculty Board

DATE: October 24, 2012

SUBJECT: Renewal of the Queen's-RMC Fuel Cell Research Centre

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As required under the Senate "Procedures Governing the Establishment, Reporting and Review of Research Centres, Institutes and other entities at Queen's University", at its meeting of October 24, 2012 the Engineering and Applied Science Faculty Board approved the following motion:

"That the Queen's-RMC Fuel Cell Research Centre be renewed for an additional five years"

Attached are the motion, final report and recommendation from the Dean's Advisory Committee.

Ann Messenger
Secretary of Faculty Board
Faculty of Engineering and Applied Science

Faculty of Engineering and Applied Science Faculty Board

To Members of the Engineering and Applied Science Faculty Board

Motion to Renew the Queen's-RMC Fuel Cell Research Centre for an additional Five Years

The Centre has established itself as a recognized research Centre both nationally and internationally. The Centre is Canada's leading university-based research and development organization in partnership with industry dedicated to advancing the knowledge base for addressing the key technology challenges to the commercialization of fuel cell applications. The Centre was granted provisional approval in March 2004 and an extension in December 2008.

The proposal to establish the Queen's-RMC Fuel Cell Research Centre was approved by Senate in September 2007 and ratified in September 2007 by the Board of Trustees, as a Faculty-based Centre in the Faculty of Engineering and Applied Science reporting to the Dean of the Faculty of Engineering and Applied Science.

Under Senate guidelines, a Dean's Advisory Review Committee was established in the Fall of 2011 to review the current operations and future prospects of the Centre and to recommend renewal or closure of the Centre. After careful deliberations, the committee has recommended that the Centre be authorized to continue for an additional five years.

At the October 24, 2012 meeting of Faculty Board, I will move:

> *"That the Queen's-RMC Fuel Cell Research Centre be renewed for an additional five years".*

Kimberly A. Woodhouse
Dean
Faculty of Engineering and Applied Science

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October 10, 2012

Dr. Kimberly Woodhouse
Dean
Faculty of Engineering and Applied Science
Queen's University
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RE: Advisory Review Committee for the Queen's-RMC Fuel Cell Research Centre (FCRC)

Dear Dean Woodhouse:

In accordance with Queen's University Senate Policy on "Procedures Governing the Establishment, Reporting and Review of Research Centres, Institutes and other entities at Queen's University", you appointed a Dean's Advisory Committee in the Fall of 2011 to review the Queen's-RMC Fuel Cell Research Centre (FCRC) and the work of the committee has concluded.

The committee met twice during its deliberations between January and March 2012. The results of our deliberations and our recommendation are provided in the attached *"Report of the Dean's Advisory Review Committee for the Queen's-RMC Fuel Cell Research Centre (FCRC)".*

The committee is strongly recommending that the Queen's-RMC Fuel Cell Research Centre be renewed for another five years.

Sincerely,

A.K. Pilkey
Chair
Dean's Advisory Review Committee for FCRC

Attachment

REPORT OF THE DEAN'S ADVISORY REVIEW COMMITTEE FOR THE QUEEN'S-RMC FUEL CELL RESEARCH CENTRE (FCRC)

October 2012 ***Queen's University at Kingston***

An Advisory Review Committee was appointed in December 2011 by Dean of Engineering and Applied Science, Dr. Kimberly Woodhouse, to review the Queen's-RMC Fuel Cell Research Centre (FCRC) with the mandate to advise her on the present state and future prospects of the Centre and to recommend to Senate either:

a) the Centre be authorized for a further period of up to five years, or
b) the Centre be phased out of existence during the remaining year of its authorized life.

The committee was composed as follows:

Keith Pilkey, Mechanical and Materials Engineering (Chair)
Joe LeBlanc, Financial Services
Scott Parent, Chemical Engineering
David Rappaport, School of Graduate Studies
Brian Surgenor, Faculty of Engineering and Applied Science
Chris Thurgood, Chemistry and Chemical Engineering, RMC
Steve Tanner, Faculty of Engineering and Applied Science (Secretary)

A notice concerning the establishment of the committee and its terms of reference was published in "For the Record" on December 19, 2011. Members of the University community were invited to send comments to the committee by January 16, 2012; no responses were received.

In conducting the Centre review, the Advisory Committee completed the following tasks:

1. Review of Senate's General Guidelines for Conducting a Centre/Institute Review;
2. Review of the FCRC constitution;
3. Review of FCRC's annual reports (2006-2010) and draft annual report for 2011;
4. Review of minutes of annual meetings of the FCRC Advisory Council (2005-2011);
5. Review of current FCRC statistics regarding faculty, staff, students, research projects and publications;
6. Review of FCRC's five-year budget and research plan;
7. Meetings on January 31, 2012 and March 12, 2012; and
8. A site visit on March 12, 2012.

At the Advisory Committee's initial meeting on January 31, 2012, committee members reviewed and discussed the procedures for a five-year review of a research centre and documentation summarizing FCRC's operations from 2006-2011. This discussion produced several document requests and a series of questions for the Director of FCRC, Dr. Brant Peppley, in advance of the committee's site visit. These requests and questions are attached as Appendix A.

The Advisory Committee conducted a site visit at FCRC on March 12, 2012, which involved three meetings:

1. A meeting with Dr. Brant Peppley (Director), Dr. Jon Pharoah (Associate Director) and Barbra Brousseau (Administrator);
2. A meeting with selected FCRC graduate students: Jillian Lackey (MASc Civil), Todd Allward (MASc Chemical), Rajesh Parmar (PhD Chemical), Hamid Falahati (PhD Chemical); and
3. An in camera meeting of the Advisory Committee.

The meeting with Dr. Peppley, Dr. Pharoah and Ms. Brousseau produced the following notable observations:

1. Fuel cell technology remains a significant topic of interest in the research community and in industry.
2. FCRC is a recognized name both nationally and internationally; in effect, the name has been branded.
3. The scope of FCRC has been expanded to include complementary research topics, such as electrolyzers.
4. The master list of personnel with lab and/or office space at FCRC includes 9 faculty members, 8 other personnel and 60 HQP.
5. FCRC is an example of a multidisciplinary research centre where faculty and HQP are in one physical location (similar to HMRC and CNS), with high-quality research space that cannot be found on Queen's campus.
6. The near-future budget and research plan of FCRC is centered around a successful ORF-RE grant application that runs through to 2015, which corresponds to the end of year 4 for the current five-year renewal of the centre.
7. The future of FCRC is also tied to the future of Innovation Park (IP). Therefore, IP should be looking to attract new clients that fit the mandate of FCRC, such as Hydrogenics and Ballard Power Systems.

The meeting with the FCRC graduate students produced the following notable observations:

1. The Director is highly visible and active in the day-to-day operations and supervision of graduate students at FCRC. The same cannot be said for the Associate Directors.
2. The laboratory facilities at FCRC are generally considered to be superior to those on Queen's campus, with better technical support and an easier process for purchasing supplies and equipment.
3. Despite the high numbers of faculty members and HQP associated with FCRC, on a typical day, 1 or 2 faculty members and fewer than 20 HQP are actually present on site.
4. There appears to be little interaction and collaboration between the various FCRC researcher groups. All four of the students interviewed were unfamiliar with the research being undertaken by the other three.

5. The off-campus location is generally not viewed as a detriment, although it is recognized that students located at FCRC are disadvantaged when it comes to social interactions with the Queen's community, use of the ARC and carrying out their TA duties.

The Advisory Committee's in camera meeting resulted in a number of recommendations:

1. The mandate of FCRC should be expanded to include complementary research areas, such as electrolyzers.
2. The name, Fuel Cell Research Centre, should not be changed, given that it is viewed as a recognized brand.
3. The Associate Directors need to take on a more active role in FCRC. The committee recognizes the considerable effort made by the Director to oversee the general operation of FCRC, as well as the planning and preparation of the most recent ORF-RE grant application.
4. A formal framework is needed to establish a higher degree of interaction and collaboration between the various research groups at FCRC.
5. FCRC needs to raise its profile with the Queen's community (eg. a fuel cell powered FCRC van and on-campus H_2 electrolyzer facility) and within the research community (eg. hosting of an annual conference)
6. FCRC should explore avenues of long-term, sustainable funding above and beyond government funding programs, such as ORF-RE. Possible avenue include a major industrial sponsor.
7. FCRC should develop a set of performance metrics that includes not only measures of HQP training and publications, but also measures of industry engagement and intellectual property generation, so the Director can effectively track progress towards the goal of becoming a sustainable research centre.
8. The relevant departments at Queen's need to recognize the difficulties associated with FCRC graduate students travelling to campus to perform their TA duties by giving them assignments with fewer, longer TA sessions (e.g. 3-hour labs) or flexible hours (e.g. marking of assignments).
9. FCRC should update the Centre's Constitution.

In conclusion, it is the unanimous view of the Advisory Committee that, over the past five years, the FCRC has established itself as a recognized research centre both nationally and internationally. Furthermore, FCRC has recently secured a substantial level of operational funding, in the form of an ORF-RE grant, to maintain and potentially expand its operations for at least the next four years. While there is concern that FCRC cannot continue to be so heavily reliant upon government-based funding programs, such as ORF-RE, for its long-term sustainability, the Advisory Committee fully supports the continuation of FCRC as a Queen's Research Centre for another five-year term.

Respectfully submitted on behalf of the Committee,

A.K. Pilkey, Department of Mechanical and Materials Engineering (Chair)

Appendix A

Additional Information to be Requested from FCRC

1. Recent ORF RE05 proposal
2. Draft of 2011 Annual Report – in particular current projects and priorities
3. Statistics of FCRC "Output" for past five years – number of graduate students, number of students that graduated, patents, spin-off companies, commercialization, total publications, student publications, analysis of what students do when the leave FCRC, other measures that the Centre uses to track output and productivity
4. List of all previous Graduate Students – Names, thesis titles and publications
5. List of current PI's with space at FCRC
6. List of current graduate students that call FCRC "home"

Topics for Discussion with the FCRC Director

1. Future Outlook
    a. What is the future outlook for Fuel Cell technology?
    b. What are budget/financing plans for five years to March 2017 (ORF submission covers to September 2015)?
    c. What is the future of OFCRIN and how is its success linked to FCRC?
    d. Would the Director propose any changes to the original mission/mandate of the FCRC? Consider drafting a new mission statement for the Centre.
    e. How does the Director view the developing relationship with St. Lawrence College?
    f. What are the future plans with respect to location and naming of the Centre?
    g. What are future plans to link with other "energy centres" at Queen's?

2. Centre Operations
    a. Overview of current research collaboration and partnerships.
    b. How does the Director measure the output and productivity of the FCRC? Have targets been established?
    c. What are the current projects and priorities?
    d. Are the financial numbers in the forecast to September 2015 contained in the ORF RE05 proposal firm numbers or just projected amounts?
    e. What is the role and responsibilities of the Associate Directors?

3. Graduate Student Program
    a. How do graduate students fit within the FCRC?
    b. What is the strategy to attract high-quality graduate students?