

## NSERC Reallocation Exercise: The Industrial Engineering Results

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The Natural Sciences and Engineering Research Council of Canada (NSERC) supports Industrial Engineering research by providing grants to Canadian university researchers. The Industrial Engineering Grant Selection Committee (IEGSC) is one of many NSERC Grant Selection Committees (GSC's). As the national instrument for making strategic investments in Canada's capability in science and engineering, NSERC believes that new initiatives and emerging fields of research that have the potential to become very important should be supported. NSERC has developed a *reallocation* process to rationalize the allocation of its budget to its many GSC's and enable it to respond to new initiatives and emerging fields. As part of the exercise, each discipline is asked to return 10% of its annual budget to NSERC.

The second NSERC reallocation exercise started in June 1997 and its results were published last June. In its report, the Council also announced that the reallocation exercise will become a formal process taking place every four years. It is therefore important that the Canadian I.E./O.R. community prepares itself adequately to take advantage of this process. For the current exercise, the annual budget of the IEGSC went from 4.61 to 4.98 million dollars, which represents an 8% increase. This is so, however, only because \$10 million of new funds from the recent increase to NSERC's budget were added to the \$20 million to be redistributed. Our discipline is therefore not among those who really benefited from this reallocation exercise, and this despite the fact that our proposal was considered excellent by the I.E./O.R. community and by the external referees. The aim of this short article is to review the process followed to prepare our submission, to examine the comments made on our proposal by the Reallocations Committee and to identify what should be done to obtain better results in the future.

In 1997, each GSC was asked to prepare and submit a proposal for funds in the form of a response to the question, "Why is it important for Canada that your research community should receive some of the funds available for reallocation"? It was up to each community to state its case as it thought best in a document which was limited to 10 pages in length. The steering committees preparing the proposal of each discipline were required to discuss the following:

- A vision for the discipline in Canada: specific emerging areas, strengths and priorities for the future, the need for training, and a discussion of how the research community overlaps, interacts, collaborates with or directly affects other research communities.
- Specific proposals that would enhance research in the discipline and be of importance to Canada. The relation of such proposals to the vision, as well as their feasibility, was an important consideration. Each proposal was to include its cost and duration (of one to four years).
- Discussion of the consequences if none of the steering committee's proposals were funded.
- Comments on the NSERC GSC structure, and suggestions for improvements to it.

Although we were asked to discuss all these issues, it was clearly stated that funds would only be reallocated to specific proposals.

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The IEGSC submission was prepared by a subcommittee I chaired. The other committee members were John Buzacott (York), Eldon Gunn (TUNS), Chris Higgins (Western Ontario) and Dave Martell (Toronto). A web site (<http://www.fsa.ulaval.ca:80/canadaie>) was set up to facilitate communications and the entire Canadian I.E. community was encouraged to provide information and suggestions for consideration by the committee. A first draft was produced and largely circulated. Several persons across Canada made improvement suggestions which were incorporated in the final document.

NSERC also asked us to nominate highly respected individuals from the research community who could serve as Reallocations Committee members. Unfortunately, our suggestion was not retained and no one with an I.E. background was appointed on the Reallocations Committee. Information on the Committee membership and on its terms of reference is available on NSERC's web page (<http://www.nserc.ca/programs/allo1.htm>). NSERC also asked us to provide a list of international experts, covering the various aspects of the discipline, who could act as external referees. The list of questions asked to external referees is available on NSERC's web site. Based on the vision and strategic directions developed in the document, three specific proposals were made in our submission:

- 1) A 12.2% budget increase to adequately support the current I.E. base and new applicants.
- 2) An additional 1% increase to support structured research groups in existing and emerging Research Centres.
- 3) An additional 1% increase to support emerging and underdeveloped areas.

The rationale behind these specific requests is explained in our submission (<http://www.fsa.ulaval.ca:80/canadaie/submission.html>). The six external referees all found our vision and strategic directions to be particularly relevant. One of them states: "I am delighted with a vision that is a broad, holistic interpretation of industrial engineering incorporating appealing values that lead to high expectations of contribution to real-life decision making now and in the future". They also all believed that Canadian contributions in the field ranked at least on par with those of the international community.

The Reallocations Committee assessment was less positive. They found that the document "provided a clear indication of the nature of the discipline", but that it "did not present a clear vision for the discipline". They felt that "exciting problems were noted briefly but there were no links to indicate how industrial engineering would contribute to reducing or eliminating them". They take as an illustration the fact that although we state that I.E. is a major key to resolving the productivity problem of Canada, we "failed to provide a plan or strategy to address this problem". They add that "the submission did not identify priority areas for the discipline, or those of emerging importance". This last statement is somewhat surprising since the section of the proposal dealing with the strategic directions we favour was precisely dealing with these issues.

- The Committee was "impressed by the interdisciplinary/multidisciplinary aspects of research carried", but was not convinced that the proposed plan deserves a larger allocation. They were "intrigued that I.E. has important contributions to make in complex problems, such as education, health care, and law enforcement" but they conclude that we failed to describe "how such issues would be addressed by the I.E. community". The following comments were made on our specific proposals:

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- *Proposal 1 - Support an increase in average grant and new applicants.* The proposal to provide adequate support for new applicants was supported, but not the additional budget requested for the I.E. base. They add that “the document was almost silent about how selectivity would be made a part of this proposal”.
- *Proposal 2 - Support for structured research groups in existing and emerging Research Centres.* This was supported in the full amount requested.
- *Proposal 3 - Provide funding for the development of emerging and underdeveloped areas.* The Committee felt that progress towards this goal could be achieved within the current funding envelope of the IEGSC.

The least we can say is that the Reallocations Committee was expecting us to provide a lot of explanations in the 10 pages that we were allowed to submit. Some of the issues raised seem directly related to the fact that the Committee did not really understand the scope and nature of I.E. work. Some of the comments are also contradictory. They congratulate us on the interdisciplinary/ multidisciplinary aspects of our research, but at the same time they feel that we were not focussed enough in our proposals.

Given the small size of the IEGSC compared to other disciplines, it is likely that the problems encountered this year will also be present in four years. It seems also clear that we will have to be more specific in our proposals next time, which implies that the I.E. community will have to select a small number of research areas to put forward in the proposal. Given the diversity of our field, making such a choice will not be easy and it is likely to raise dissatisfaction among the community members who are not working in these areas.

The responsibility of these difficult decisions rests in the hands of the IEGSC members, but in order to reflect the needs of Canada and the aspirations of the I.E. community, they must result from a broad consultation process. In the past, strategic planning was not a preoccupation of the NSERC I.E. Committee. This must change if we want to have more funds to support our research in the future. Strategic planning for the discipline should be a continuous process and it should become a priority of the IEGSC.

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