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Performance Based Research Fund – Phase two consultation

Submission to the Tertiary Education Commission
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Background to IPENZ

The Institution of Professional Engineers New Zealand (IPENZ) is the lead national professional body representing the engineering profession in New Zealand. It has approximately 10,000 Members, including a cross-section from engineering students to practising engineers to senior Members in positions of responsibility in business.

IPENZ is the Registration Authority under the Chartered Professional Engineers Act, responsible for setting and maintaining competence standards for professional engineers. It is the New Zealand signatory to international agreements for mutual recognition of professional engineers and engineering technologists.

In addition, IPENZ is the professional accreditation body for engineering qualifications in New Zealand. This accreditation provides for the international recognition of four-year Bachelor of Engineering degrees under the Washington Accord and three-year Bachelor of Engineering Technology degrees under the Sydney Accord. This accreditation programme has been operating since 1980 and involves assessment of qualifications and qualification outcomes (graduate capabilities) against international benchmarks.

Accreditation and standard setting activities are governed by IPENZ's Standards and Accreditation Board, which is responsible for ensuring the competence and qualification standards we set take into account international best practice.

This submission has been developed by the IPENZ Standards and Accreditation Board. IPENZ Members have been consulted.

Executive Summary

As an accreditation agency, we are extremely concerned that the introduction of the Performance Based Research Fund (PBRF) has had perverse outcomes and we recommend that these be addressed urgently. While the PBRF was introduced as a funding mechanism, in the absence of an alternative it has become viewed as the de facto quality benchmark or measure of the quality or standing of academics. It has become overly central to decisions on issues like promotion and career progression, and research funding applications.

The most concerning outcome of this is that the PBRF criteria continue to favour academics involved in pure academic research, targeting publication in international, peer-reviewed journals, as opposed to well-rounded professional academics, engaged in need-industry research, consultancy, standard setting and the promulgation of new knowledge to the profession with which they actively engage. In our view, this is leading to the demise of the well-rounded engineering academic. This has the potential to have

a profound impact on the engineering profession, as we are starting to see decisions on the recruitment and retention of academic staff being influenced by PBRF criteria ahead of the interests of the profession they are serving. Not only have we observed from our accreditation activities a change in emphasis amongst academic staff, but we are starting to see this reflected in the nature of student project work, with an increasing focus on theoretical research-based projects, rather than industrial research and design activities. For a professional that has "artful doing" or the design of artefacts at its heart, this is a significant concern.

We have also received feedback that it is increasingly difficult to get professionals involved in the Standard-setting process, which has wider public good implications. We note that academics have received little recognition from tertiary institutions for voluntary contributions to the development of Standards since the introduction of the PBRF. In addition to preventing bias, involvement from academics and others with specialist skills is advantageous in ensuring that Standards are based upon proper research, and as a result are of a high technical standard and unbiased.

Following the 2003 rounds, we raised these issues in 2004 in a joint submission with the Council of Engineering Deans; however, we note that the same problems remain evident following the 2006 assessment round.

We would like to discuss this submission with the relevant officials.

Submission

The following points outline our main concerns, as previously raised, regarding the PBRF. We feel that these issues should be considered in the context of this review. We have answered the specific consultation questions in the following section.

1. BEING AN ACADEMIC IN A PROFESSION

We note that the role of academic staff in a profession is different to the role of other academic staff. The definition of a profession to which we ascribe is that often attributed to Darrell Reeck:

> A profession is an occupational group which specialises in the performance of such highly developed skills for the meeting of complex human needs, that the right use of them is achieved only under the discipline of an ethic developed and enforced by peers and by mastery of a broader contextual knowledge of the human being, society, the natural world and historical trends.

When IPENZ accredits university engineering degrees to the agreed international benchmark standard under the Washington Accord, we apply an expectation that, as well as engaging in teaching, research and community activities (as is expected of all other academics), engineering academics must contribute to their profession. Such ongoing contribution (which is vital to a research-led education) is expected to be in engagement with practitioners and in the development and setting of both technical and ethical standards used by practitioners in their own practice community.

For example, an academic doing research on the structural stability of buildings in simulated earthquakes has an immediate responsibility to engage with the practice community and share research results if they bring into question the present design practice for such buildings. That requirement for engagement should not wait until a peer-reviewed paper is published first.

We expect that leading engineering academics discuss the impacts of their research findings on good engineering practice through activities involving their professional body,

New Zealand working parties developing technical standards and codes of practice, and expert witness work.

In response to the pressures of the PBRF, which has inadvertently created a move away from professional involvement, IPENZ has revised its accreditation criteria to introduce more specific requirements for academic staff in this regard. Strict application of the new professional involvement criterion would likely put the accreditation of some engineering schools at risk.

2. THE NATURE OF RESEARCH

It is vital that the PBRF's definition of research encompasses all types of research that are considered valid and important by wider government policies, specifically those considered vital under economic development policies. There is clear encouragement for universities to engage with industry on an increasing basis, doing collaborative research that leads to practical and commercially viable outcomes. However, the definition of research (and the measurement system) does not fairly recognise these activities as valid. Consequently, the PBRF creates incentives for university researchers to abandon commercial work.

Additionally, the definition should acknowledge that New Zealand is largely a country composed of small to medium enterprises (SMEs) with limited research capability. Universities have an important role to engage with these organisations, even though the work the companies are prepared to pay for is short term, and does not demand fundamental approaches.

We also consider it vital that a clear distinction is made between developing ways to improve professional practice (which is more often than not research) and doing professional practice (which is not).

3. DEFINITION OF MEASURES FOR RESEARCH QUALITY

The definition of research quality remains a major issue. We recognise that the dominant international means for defining research quality is to use the results of anonymous peer review; however, we note that this is not a perfect measure. The engineering profession has an ethical value that members of the profession should not review the work of other engineers without informing them. Applied strictly, this means that engineering academics should not participate in anonymous review. Whether they do or not is not the issue, the issue is whether the measurement of quality by peer review is improved or worsened by identifying the reviewers. Some public review is the norm for conference papers (via questions) and many would argue that when discussion is recorded the reader finds this a meaningful way to evaluate quality. Some engineers who have chosen to forego anonymity in reviewing journal manuscripts have reported that they consider a better and more robust review occurs when they identify themselves to the authors and debate their concerns. Some also report being the victim of vindictive competitors who abuse the anonymous process.

The reason we raise these matters is to question the relative weighting applied to anonymous peer review compared to other measures of quality. We would argue that peer review is vitally important, but its importance compared to other measures may be over-rated.

For a profession such as ours, we argue that "fitness for purpose" is also a valid quality measure, which is considerably undervalued by the PBRF. If a researcher solves a problem that needs researching, and does so efficiently and effectively using a valid and robust research methodology then is it not good-quality research? Further, a researcher should be able to receive credit for work that meets national needs and wider policies

such as the economic transformation or sustainable development agenda, but for which fundamental approaches are not possible.

Because we are a nation of SMEs, research for industry may be confidential and not put forward for evaluation. Consequently, there needs to be another means by which researchers can put forward evidence of fitness for purpose. In 2004 we argued one possible means is that, as one or more of the four nominated pieces of research output, a researcher could present a piece of evidence provided it has the following components:

- a description of the research outcome (the novel contribution)
- evidence of uptake of the research in the private sector for commercial reasons
- evidence of uptake of the research in Standards and/or codes of practice used by the researcher's profession
- estimates of the economic or other value generated by the research (actual to date and potential)
- indirect evidence of benefit, for example, a continued relationship and/or investment by a private sector organisation which suggests a satisfied client whose needs are met
- review statements by one or two people (other than the researcher) verifying the accuracy of the information supplied

The panels should be as able to evaluate this type of evidence as a research paper. Researchers would soon learn that the weighting they can expect to be applied to this type of evidence will depend at least in part on getting the highest possible quality of independent verification.

We would also expect that both the novel contribution and the research impact would have to be outstanding to achieve an "A" using a portfolio including evidence intended for evaluation by the fitness for purpose criterion.

We understand that many engineering academics had little confidence that the 2006 round was any different in practice to 2003.

4. EVALUATION METHODOLOGY

We consider that the use of numerical formulae has major problems when considering individual researchers. If we return to basic principles, the concept of profiling developed by the 2001/2002 working party was that researchers would put forward their best evidence to show which profile (A, B or C) their research quality corresponded to. The profiling system allows evidence to be infinitely variable, and the panel would look at the evidence profile as a whole and decide which profile a person best fits. This process requires a holistic judgement, not the addition of three numeric scores from three types of evidence.

The use of a numerical scoring system can cause behaviours that are inconsistent with the basic concept of a holistic judgement of best evidence against a profile. We have been told that some academics reacted to the numerical system by attempting to maximise their numerical score, rather than presenting their best evidence overall. We have also received comments that if their best evidence was of a kind that fell into one of the lower weighted areas they were put off presenting it. Some engineering academics got the idea that fitness for purpose was not a valid research quality measurement.

We consider that the formulaic approach and the reaction to it does not allow the proper evaluation of research (via the fitness for purpose measure) for engineers who take seriously their responsibilities to national professional practice. Just as the award of Fellowship of the RSNZ relies as much as anything on statements from others, the work of an engineer taking their research immediately into national professional practice can only really be measured as fit for purpose (good quality) via the views of others – clients, and statements from those working with them in developing codes of practice and Standards.

As we have stated earlier, if the way quality is measured in the PBRF is at odds with the way research quality is measured and valued professionally (for example, via translation into improved practice) the PBRF will have perverse and negative impacts. Sufficient improvements to fitness for purpose measures and the weighting that can be given to this type of evidence will eliminate these effects.

The following are our responses to the specific questions asked in the current round of peer review:

5. OVERALL EFFECTS OF THE PBRF ON THE TERTIARY EDUCATION SECTOR

- *What has been the effect of the PBRF on the New Zealand research base?*

We are unable to comment.

- *Is there specific evidence of improvement in the quality of New Zealand's research, or is it too early to make any judgment?*

From the fitness for purpose viewpoint the impact has been negative.

- *Do you identify any actual, or emerging, negative effects that the PBRF is having on the type of research goals being pursued or on other aspects of the tertiary education system?*

We note that there has been an increase in academic research and a decrease in practical research.

- *Do you recognise some research, or types of research, as being inherently more risky than others? If so, do you perceive that the PBRF has had any effect on 'risky and innovative research'? (This concern relates specifically to Tertiary Education Strategy priority 4 "Improving research connections and linkages to create economic opportunities").*

We note that there appears to be a move away from commercial research towards academic research.

- *Are there particular strategic or management changes in TEOs that have occurred because of the PBRF?*

We are unable to comment

6. CONSEQUENCES OF THE PBRF FOR RESEARCH AND RESEARCHERS

- *Do you feel that the PBRF has had any intended or unintended consequences on new and emerging researchers?*

There has been a very negative impact on those trying to become rounded professionals.

- *Have there been any intended or unintended consequences of the PBRF on research assessment on the humanities, on social sciences or on professional areas of research (for example, health)?*

We have outlined unintended consequences of the PBRF on engineering-related research in the preceding section, the result of which as been a very negative effect.

- *What have been the intended or unintended consequences for work with research users in the public and private sector or on engagement with the community?*

As discussed earlier, there has been a decrease in the involvement of academics working on Standards or accreditation.

- *Do you feel that the PBRF has had any intended or unintended consequences on the time researchers can spend on administration duties?*

We are unable to comment.

- *What consequences has the PBRF had for Māori researchers?*

We are unable to comment.

- *What consequences has the PBRF had for Pacific Peoples' researchers?*

We are unable to comment.

- *What other selective or differential effects of the PBRF have you observed?*

No further comment.

7. POSSIBLE IMPROVEMENTS TO THE PBRF SYSTEM

- *Please comment on whether you are broadly content with or would suggest possible changes to the following:*
    - *Weightings for the three PBRF components (Quality Evaluation; research degree completions; and external research income).*
    - *Subject-area cost weightings (applied to the Quality Evaluation and research degree completions).*
    - *The individual as the unit of assessment (in other national systems the department or subject group may be the unit of assessment).*

As outlined above, we consider the weighting of quality evaluation may be too high, and suggest that a reduction in the weighting of this component may lead to a reduction in the perverse behaviour outlined previously. We also note that the current formula does not recognise the value of fitness for purpose.

In relation to the individual as the unit of assessment, we are concerned that any score is authentic. Any attempt to measure at an accumulated level implies that somehow average quality can be measured, even for groups of academics doing quite different types of research, without considering the individuals. We do not think this is possible with any degree of accuracy if it is a continued requirement that all relevant staff must be included, not just a selected few. Therefore we would agree that measurement at the individual level is still necessary to get accuracy.

However, as we suggested in 2001, there is a smarter approach which we strongly recommend. We suggested getting institutions to self-review and then rank their list of candidates so that the panels are primarily inspecting the cutting points in the lists provided, rather than assessing every individual case. For example, if a university presents 50 researchers in rank order, the panel moves the cutting points up and down (for example at the A/B interface) until the panel considers the right number of overall As is given. These As do not need to be assigned to any individual because the panel is reporting only a number of As and to do so does not need to accept the university's rank order as correct. Hence, all the negative aspects of individual scores can be avoided, but the same accuracy maintained, and the workload reduced. Further, as the ranking agency, the university can respond with appropriate professional development to assist staff disappointed by their ranking.

Reducing the weighting of quality scores and increasing the weighting of external income and postgraduate completions would also reduce the perverse effects outlined previously.

Notwithstanding the above, the process for determining individual scores tends to over-focus on the four research outputs, requiring these to be heavily weighted towards peer-reviewed publication, rather than concentrate on a holistic assessment of the level of research competence demonstrated. We consider better holistic judgements will be made by using the ranking system outlined above. We consider that applying a university's self-review ranking would reduce the perverse outcomes of using the individual as the unit, and the benefit of greater accuracy justifies continuation at that level.

- *In regard to the processes and procedures for the 2006 Quality Evaluation, are you aware of any evidence about specific features that worked well or about problems arising from either the design of the quality evaluation or its implementation?*

We are unable to comment.

- Can you suggest how these processes and procedures might be improved for the 2012 Quality Evaluation?

We have no further comment.

Conclusion

As an accreditation agency, we are extremely concerned that the introduction of the PBRF has had perverse outcomes and we recommend that these be addressed urgently. The PBRF has become viewed as the de facto quality benchmark, or measure of the quality or standing of academics, and has become overly central to decisions on issues like promotion and career progression, and research funding applications.

The most concerning outcome of this is that the PBRF criteria continue to favour academics involved in pure academic research as opposed to well-rounded professional academics, engaged in need-industry research, consultancy, standard setting and the promulgation of new knowledge to the profession with which they actively engage.

In our view, this is leading to the demise of the well-rounded engineering academic. This has the potential to have a profound impact on the engineering profession, as we are starting to see decisions on the recruitment and retention of academic staff being influenced by PBRF criteria ahead of the interests of the profession they are serving.

We have also received feedback that it is increasingly difficult to get professionals voluntarily involved in the technical standard-setting process, which has wider public

good implications. In addition to preventing bias, involvement from academics and others with specialist skills helps ensure that Standards are based upon proper research, and as a result are of a high technical standard.