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25 September 2008

Defence White Paper Team
Defence Establishment Fairbairn
FA-G-015
26-28 Fairbairn Avenue
CANBERRA ACT 2600

Dear Members of the Defence White Paper Team

Re: Submission to the Defence White Paper

I write in response to the invitation from the Minister for Defence Science and Personnel, the Hon. Warren Snowden, to lodge a submission on the Defence White Paper.

As I am sure you are aware, Australian universities play a significant role in the development of national capability, both in terms of on-going research and development and in student education. There is no doubt that a significant component of this capability is of direct relevance to the Defence and Security community, a situation increasingly recognised over the recent years through the establishment of formal links, e.g. the Strategic Alliance between the University of Adelaide and Defence Science and Technology Organisation (DSTO).

Universities have further responded to various defence needs by way of direct participation in programs such as the Rapid Prototyping and Development Environment (RPDE); the establishment of Defence-focused groups (e.g. Centre of Expertise in Photonics); and direct support to the defence industry, e.g. the Capability and Technology Demonstrator (CTD) Program, contract research, and education programs.

This submission is focussed on three main questions posed in the Defence White Paper which are of particular relevance to the university sector.

1. How might we meet the workforce challenge?

Universities across the globe are grappling with declining student demand for educational programs in the disciplinary areas of science and engineering. In this regard, there would be some value in establishing a program whereby the Department of Defence, working with the defence industry, collectively offer a far larger number of scholarships to attract students to study engineering and science topics. This would contribute to a subsequent flow of graduates into defence industries.

The Skilling Australia Defence Initiative (SADI) program allows for industry development of the workforce, but largely ignores undergraduate students in terms of pursuing a defence-related career. A change to the SADI policy to engage more directly with universities would re-establish the 'clever country' as a priority goal, and provide a greater number of graduates who are 'defence ready' through undergraduate programs tailored to meet defence industry needs, e.g. elective courses in systems engineering for final year students.

In the United States and other countries, senior rank officers are required to undertake coursework to Masters level, thus ensuring a common standard of education for those ranks. A similar system should be adopted in Australia. Where the Department of Defence enters into education/training off-shore, a comparison of the cost to develop and undertake such training locally should occur. With the right commitment, local coursework can be developed and sustained with an Australian university-conferred degree and off-shore expertise brought in as needs dictate, thereby ensuring that the knowledge capital is developed and sustained locally. Additionally, newer degrees, such as Professional Doctorates, might be developed that are tailored to defence staff needs.

On a related issue, for Australian researchers who are often encouraged to go overseas to experience 'best practice' research, there are generally insufficient research programs to draw them back to Australia in the short term. Research programs need to be developed that are strategic in nature (set against national priorities); have sustained funding (e.g. over a period of 10 years or more); promote international collaboration; are strongly linked to industry and the DSTO; and which can encourage students into engineering and science programs.

2. How might we better integrate industry?

We should not underestimate the importance of research and development as an integral part of the industrial base and our national capability. A solid research foundation fuels both small and large companies alike, and allows for innovation in design and development that maps into defence capability, acquisition and sustainment. Programs such as the CTD should be further developed. For example, there should be funding for Technology Readiness levels one through to seven, not just for levels five to seven as currently occurs. Allowing for more basic research provides a much stronger basis for industry adoption of relevant research.

Australia requires a mature industry that is able to develop new technology and services, bring them to market both nationally and internationally, and sustain them through an appropriate life-cycle. Internationally we see this cycle underpinned by industry having strong research and development capacity and capability, something sadly lacking in Australia's defence industry. Furthermore, the lack of attractive career paths for researchers associated with the defence industry contributes to an increased flow overseas, further decreasing our high end capacity. This poses a longer term national security risk if defence-related developments need to be carried out off-shore due to a lack of advanced skills.

Often Australian research and development is initially sent off-shore to return as a Commercial-Off-The-Shelf product. Where the Department of Defence intends buying services overseas and there is an equivalent Australian capability, serious consideration should be given to the development of the local capability, which may have export possibilities.

Of course, this is not to suggest that international collaboration should not be encouraged and funded. The US Asian Office of Aerospace Research and Development program is a good example of the effectiveness of this approach, providing for travel funds, development of research white papers, and a full technology development program. In fact links with industry generally need to be

further promoted and funded. One way to do this would be through alliances (e.g. Maritime, Land, Aerospace) established between universities and industry, with a lead Group of Eight (Go8) research-intensive university encouraging other universities to develop and sustain skills of relevance to the defence sector.

The Australian Government could also consider encouraging strong links between the university sector and industry by way of incentive programs specific to defence, e.g. further tax rebates.

3. What Capabilities do we want?

In terms of a technical readiness level as defined by Defence, support is needed along the lines defined in the US Department of Defence Science and Technology Program:

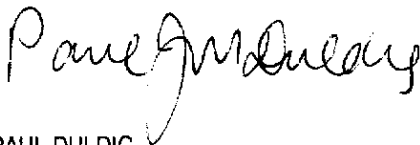
- Basic Research - supporting research that produces new knowledge in a scientific or technology area of interest to the military.
- Applied Research - supporting the exploratory development of new technologies for specific military applications or further development of existing technology for new military applications.
- Advanced Technology Development - supporting larger scale hardware development, integration, and experiments that can demonstrate capability in more operationally realistic settings.

The US program recognises and provides for the full life cycle of development of research from concept through to implementation. As mentioned above, this has not been achieved in Australia and should be a major aim focused on the Go8 universities working with other universities in each State.

The Government needs to give clear support to a consolidated research and development program to drive industry and research institutions, developing a clear strategic roadmap with funding for the full life cycle. This roadmap should define key technologies/capability areas where self-reliance is mandated and should include a network of defence providers, including a sub-set of the universities. This would incorporate an integrated approach that ties capabilities in technology and the workforce to national needs.

I hope that you will find these comments useful in your deliberations.

Yours sincerely



PAUL DULDIG
Acting Vice-Chancellor and President