

The New Reactor: National Interest & Nuclear Intrigues

A Response to the Submission of the Department of Foreign Affairs & Trade and the Australian Safeguards Office to the Senate Economics Reference Committee

This paper is an expanded version of a [submission](#), *National Interest or Nuclear Interest*, presented to the Senate Economic References Committee.

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ACRONYMS

ANSTO Australian Nuclear Science & Technology Organisation
AONM Australian Obligated Nuclear Material
ASO Australian Safeguards Office (Note: since this paper was written, the ASO has been renamed the Australian Safeguards and Non-Proliferation Office.)
BoG Board of Governors (of the IAEA)
DFAT Department of Foreign Affairs & Trade
IAEA International Atomic Energy Agency
NPT Treaty on the Non-Proliferation of Nuclear Weapons
RCA Regional Cooperation Agreement (of the IAEA)
RRR Research Reactor Review

SUMMARY

"Our contribution in terms of technology through the reactor is probably more important in terms of our designated seat (on the IAEA) than our export of uranium." Department of Foreign Affairs and Trade, May 11, 1998, evidence to the Senate Economics References Committee. Hereafter referred to as the DFAT/ASO Senate Evidence.

Two of Australia's nuclear ambitions - to become a nuclear weapons state and to build nuclear power reactors - have failed to materialise. The third, that of becoming a leading player in the nuclear industry, was realised when Australia secured the permanent designated regional seat on the Board of Governors (BoG) of the International Atomic Energy Agency (IAEA). That position was gained in the 1950s through selling uranium to the US and UK for their nuclear weapons programmes. Over the past two decades, however, the importance of uranium to Australia's role in nuclear matters has declined.

The Department of Foreign Affairs and Trade (DFAT) and the Australian Safeguards Office (ASO) claim that it is now the operation of a research reactor which is more important in maintaining Australia's position on the IAEA. DFAT/ASO fear that if Australia loses its position on the IAEA then its work on nuclear materials safeguards and non-proliferation and its wider political influence - all of which are relevant to the 'national interest' - will be diminished. This paper asks how those 'national interest' elements of Australia's work on nuclear issues might be met without a reactor. The conflicts between Australia's obligations under the IAEA statute, the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), its defence treaties and its safeguards and non-proliferation work, are also examined.

The IAEA is a promoter of dual-use civil/military nuclear technology - such as reactors and associated technologies - which increase the use and trade in uranium and plutonium. This conflicts with the Agency's work in 'safeguarding' nuclear materials from use in atomic weapons. The obligation placed on Australia by the aims of the IAEA, including the continued sale of uranium, compromises its work on non-proliferation and safeguards. Similar dilemmas arise through Australia's support of the NPT. The Treaty demands that non-nuclear weapons states must not pursue nuclear weapons programmes. However, the NPT also contains a clause (Article IV) on the "inalienable right" of all countries to have access to dual-use nuclear technology for 'peaceful' purposes.

Another matter related to the new reactor and its 'national interest' implications is the defence treaty Australia has with the US. Central to this agreement is Australia's reliance on the US nuclear umbrella - making Australia a nuclear weapons state by proxy. (ANZUS Treaty, which came into force on 29 April 1952. See also "Defending Australia", Defence White Paper, 1994, AGPS, Canberra, pp.95.) This has led Australia to compromise on non-proliferation efforts and created further inconsistencies in its nuclear policy. An example of this is Australia's refusal to support a proposal for a time-line for disarmament at the 1995 Review & Extension Conference on the NPT - a proposal the US and other nuclear weapons states resisted contrary to the aims of the NPT. Questions have also been asked over how much of Australia's nuclear 'cooperation' with countries in the region is linked to the objectives of the defence agreement with the US? There is one other crucial aspect of the 'national interest' question which also concern nuclear weapons and security issues. Whilst Australia currently relies on coverage by US nuclear weapons that situation may not always prevail. Officials have claimed that it is essential for Australia to have its own cadre of national nuclear scientists on which Canberra can rely for nuclear expertise. Should such expertise also be taken to mean that Australia would have its own, independent, nuclear weapons 'capability' - albeit that such would be contained in the intellectual property of nuclear agency staff? As successive governments have already raised this issue it is not unrealistic that this might be a motivation behind the current proposal.

Australia's role in regional nuclear fora, the conflicts within the IAEA statute and the NPT, the nuclear aspects of defence treaties, the need for "our own" nuclear technicians and the trade in uranium are all relevant to the 'national interest' claims associated with the reactor. The links between the IAEA, the trade in nuclear materials, technology transfer, the NPT, the US nuclear umbrella and the proposed reactor need to be unravelled. Given the constraints on government spending, questions also need to be asked if this reactor is the most efficient way to meet safeguards and non-proliferation objectives. What else might be achieved in safeguards and non-proliferation work if millions are not ploughed into the reactor?

What other ways are there to meet non-proliferation, safety and even intelligence gathering objectives, other than by having a reactor? Could Australia make a more significant contribution to non-proliferation by utilising and promoting non-reactor technology to fulfil the role the reactor now plays in isotope production and scientific research; through promoting the use of non-nuclear, renewable energy technology; by refusing to allow plutonium to be separated from spent fuel comprised of Australian uranium; by putting more money into the current safeguards regime to increase inspections; and by increasing diplomatic input into non-proliferation measures? Is it absolutely vital to be on permanently on the Board of the IAEA?

The seven page unreferenced submission from DFAT/ASO hardly suffices as a justification for why Australia should build another nuclear reactor. Despite the lack of hard information, this paper draws out some of the issues which were commented on by DFAT/ASO. Whilst not a comprehensive treatment of this complex issue, this paper does pose important questions to which the Senate Committee should pursue answers. These are some of the issues which have to be considered with the proposal to have a new reactor the push to keep Australia its seat on the BoG of the IAEA and its future role in non-proliferation. Is the new reactor and the work it supports part of the solution, or part of the problem?

NATIONAL INTEREST / NATIONAL SECURITY

Security and Non-Proliferation

The dual-use nature of much nuclear technology somewhat undermines DFAT/ASO's claim that the reactor is important to national interest because it is part of Australia's contribution to sustaining and strengthening the (nuclear) non-proliferation regime. (Submission to the Senate Economics References Committee's Inquiry into a Reactor at Lucas Heights by the Department of Foreign Affairs and Trade and the Australian Safeguards Office, May, 1998. Hereafter referenced as DFAT/ASO Senate Submission.) Through prolonging and promoting the use of nuclear reactor technology Australia may be adding to proliferation problems rather than lessening them. Since the advent of the nuclear age it has been acknowledged that much nuclear technology is dual-use capable - that is it can be put to either civilian or military use. (Large and Associates, 1995, "Dual capable nuclear technology", for Greenpeace UK. See also the Customs (Prohibited Exports) Regulations of Australia, 30 June 1996, which lists those materials and technologies which need a special export license.)

As one leading commentator noted in the early sixties: "Almost every action, every piece of research, technological development or industrial activity carried out in the peaceful uses of atomic energy could also be looked upon as a step in the 'manufacture' of nuclear weapons. There is such a large overlap in the military and peaceful technologies in these areas that they are virtually one."

The year was 1963, the writer, at first anonymous, was later revealed to be the head of the Australian Atomic Energy Commission (AAEC), Sir Philip Baxter. (Baxter, J. (using the pseudonym X), "Australian Doubts on the Treaty", *Quadrant*, Vol.XII No.3, May-June 1968, p.31. Quoted in Cawte, Alice, 1992, "Atomic Australia 1944-1990", New South Wales University Press.)

The official view on nuclear technology has not changed since Baxter's day. Whilst many national government officials have tended to play down the dual-use capacity of nuclear technology, the IAEA has been somewhat more candid. In 1995 the IAEA noted: "The peaceful applications of nuclear energy - and the promise they entail for humanity - are paradoxically often perceived in juxtaposition with the prospects of nuclear weapons proliferation and nuclear war. The mixed perception is understandable: the materials, knowledge, and expertise required to produce nuclear weapons are often indistinguishable from those needed to generate nuclear power and conduct nuclear research." (Elbaradei, E.N., and Rames, J., 1995, "International law and nuclear energy: Overview of the legal framework", *IAEA Bulletin*, No.3.)

The proposal for a new reactor and its role in nuclear proliferation has to be considered, therefore, along with the NPT, the IAEA, '*security concerns*' and Australia's work on nuclear issues in the region. What does Australia get through having an insight into the nuclear programmes of other countries? Is this useful in monitoring not only for non-proliferation, but also for gaining expertise on technology that might be used to increase its own weapons-knowledge? Are the nuclear cooperation programmes, and the links provided to other programmes, simply a guise behind which Australia is continuing to add to its own weapons knowledge? The contradictions which arise in adhering to the NPT and the IAEA statute are important in gaining an understanding relevant to these matters.

Some commentators believe that the problems which arise from the NPT allowing for the transfer of

dual-use nuclear technology more than outweigh the benefits of the non-proliferation measures contained in the Treaty. (Gruppe Okologie, Anti Atom International and Okologie Institut, "The International Atomic Energy Agency - A Critical Documentation of the Agency's Policy", Sponsored by the Austrian Ministry for Environment, Youth and Family, Vienna-Hannover, 1993.)

Similarly, the IAEA's promotion of dual-use nuclear technology has also caused much consternation. (IAEA statute, 1956, Article II "Objectives: The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. It shall ensure, so far as it is able, that assistance provided by it or at its request or under its supervision or control is not used in such a way as to further any military purpose.")

In relation to this, DFAT told the Senate Committee, "the point to note is that the agency's role is indeed to enlarge the contribution of atomic energy to peace, health and prosperity throughout the world. That is in its original statute articles. *That is the basic starting point for the IAEA*. I should also mention that it shall ensure, *so far as it is able*, that assistance provided by it is not used in such a way as to further any military purpose". (emphasis added) (DFAT/ASO, Senate Evidence, 11 May 1998, E161.)

Whilst DFAT now seems prepared to concede that the IAEA's primary role was (and for many still is) the promotion of nuclear technology rather than safeguards, DFAT chose not to explain the very real difficulties thrown up by the conflicting aims of the agency. Caught up in this dilemma does Canberra feel compelled to go along with a similar dual-function policy of an ostensibly civil nuclear programme on the one hand, whilst on the other acknowledging the problems associated with nuclear technology trade and its military potential by keeping its hand in terms of expertise on weapons? Is the reactor, linked to the IAEA's safeguards work, being used as an excuse to provide Australia with a facility which it might otherwise have problems explaining (particularly given the serious questioning over the medical and scientific reasoning behind the proposal).

The IAEA's dual role, however, remains unquestioned by Canberra. Australia gained its place on the BoG IAEA primarily because of uranium sales to two nuclear weapons states - the UK and the US. Over the years the IAEA position - it is claimed - has also conferred increased political prestige which Australia finds useful (in non-proliferation work and other fields). It seems Australia is prepared to let the IAEA's role go unchallenged because it might be too risky to question the status quo of an organisation through which it gains political power. It is worth noting, however, that the IAEA's dual-role is not reflected by the majority of national nuclear agencies where the functions of regulation and promotion are kept separate. The Australian government has recognised the importance of this separation of powers and is now moving to cut whatever residual links there might be between the Australian Nuclear Science and Technology Organisation (ANSTO), and its regulators, through the ARPANSA bill. (Australian Radiation Protection and Nuclear Safety (Agency) Act. Introduced into the House of Representatives but not yet accepted by the Senate (as at October 1998).)

However, DFAT has sought to put a more positive spin on the IAEA claiming it, "has always been considered an important means of Australia contributing to the international non-proliferation regime". (DFAT/ASO, Senate Evidence, 11 May 1998, E155.) This implies that Australia has always pursued non-proliferation goals and that the IAEA is the best organisation through which to achieve such aims. That the IAEA promotes nuclear reactors, which use uranium, or provides

opportunities to increase the political power of Australia, are issues which are not willingly discussed. Further, the historical reasoning behind the IAEA - as a means by which certain weapons states could attempt to limit nuclear weapons ownership to them alone whilst still allowing for the spread of 'peaceful' nuclear technology - is not discussed either. DFAT's opinion is very much a sanitised view and is not an accurate description of Australia's involvement or interest in the nuclear industry.

Indeed, there have actually been occasions when Australian governments have been hostile to non-proliferation measures, either because they might have reduced the opportunity to sell uranium or because they might have curtailed Australia's nuclear weapons ambitions. (See Cawte, Alice, 1992, "Atomic Australia 1944-1990", New South Wales University Press, which details the history of Australia's involvement in the nuclear industry.")

It is worth noting that when the NPT did come into force in 1970 there was reluctance on the part of Australia to sign it (Canberra signed in 1974). The impression that Australia's place on the IAEA has always been motivated primarily by non-proliferation aims is, therefore, simply not true.

Australia has shown an interest in nuclear technology which can be used in nuclear weapons development. Although this technology is now mothballed, the suggestion last year by the Government for a spent nuclear reprocessing plant (to separate highly enriched uranium from the spent fuel stored on site) only reignited suspicion's over intentions in this field (and must have attracted interest from our regional neighbours). However, ANSTO still wants a new reactor, possibly a 'conditioning' plant for spent fuel, along with new hot cells (which can be used for separation of nuclear materials) all of which means that Australia intends keeping an active hand in dual-use technology.

Doubtless DFAT/ASO will be angered at the discussions on Australia's nuclear weapons intentions. Both departments sincerely believe that they have and are making major efforts on non-proliferation. Despite this there remains a belief that this work is inherently compromised because of the conflicting aims contained in the NPT and the IAEA statute and also because of the nuclear aspects of the security alliance Australia has with the US. The latter issue certainly influences how countries in the region view Australia and its non-proliferation efforts. Being a party to a treaty which involves coverage by US nuclear weapons might well suggest to others that Australia is not be 'fair dinkum' in its approach to non-proliferation. For coverage by the US also means giving tacit approval to the maintenance and testing of nuclear weapons - something the US still does and which Australia is silent on. (Kitfield, J., "News - Fallout", National Journal, 31 May 1998, an examination of the US programme of stockpile stewardship of maintenance of nuclear weapons and nuclear weapons knowledge.)

This smacks of hypocrisy and undermines efforts on non-proliferation. This is why it is important these issues are considered with the proposal for a new reactor, Australia's regional nuclear activities and the debate on 'national interest.'

Whilst ANSTO admits that the reactor will not make any direct technical contribution to safeguards, DFAT/ASO insist it is important to have trained scientists who can work on those areas of safeguards/non-proliferation related to reactors. Is the reactor and the regional training programme a means of monitoring the nuclear programmes of other countries - as a back-up to the defence treaty

with the US? Are there other ways that monitoring role might be fulfilled without the charade of having a reactor for a cooperation programme? DFAT/ASO should be asked what other technological, scientific or diplomatic work might contribute to non-proliferation and how that contribution might be enlarged to off-set any real or perceived loss if Australia no longer has a reactor. Would pursuing alternative measures be a threat to Australia's position on the IAEA? Would losing that position be so bad if Australia were less compromised and freer to act on non-proliferation work rather than attempting to meet the conflicting aims of the IAEA statute and the NPT? How worthwhile is a new reactor compared to other measures which might be used to improve and aid non-proliferation and security work? This brings the discussion to the issue of safeguards and their relevance to the national security/new reactor debate.

IAEA Safeguards

Given the importance that DFAT/ASO attach to a new reactor and associated plant, it is somewhat surprising that they presented such a brief submission. Surely those who seek to persuade a government of the need to spend hundreds of millions on a reactor (at a time of cuts in other areas) would take the trouble to explain the exact nature of the input and insight which would flow from having staff trained on a reactor? Such information would surely help the Senate in their deliberations. Are there other more pressing issues relating to safeguards which need support, but which detract from the claims for the need for a new reactor, which DFAT/ASO have not raised?

In relation to the above is it worth noting the following points which were given in a paper by David Anderson of the Parliamentary Research Group to the Senate Select Committee on Uranium Mining and Milling in 1997. (Anderson, David, 1997, "Nuclear Safeguards", from the Foreign Affairs, Defence and Trade Group, Parliamentary Research Group Report of the Senate Select Committee on Uranium Mining and Milling, Research Papers, Vol.2, pp.212.)

These concern the changes made to the IAEA's safeguards regime as listed are:

- * environmental sampling and analysis
- * extended access for inspectors, allowing access to anywhere in and around a nuclear site (present access is limited to predetermined "strategic points"), to any location included on the expanded declaration, and to other locations for the purpose of taking environmental samples
- * intelligence and open sources (including commercial satellite imagery)
- * IAEA databases
- * Reports on exports under the voluntary reporting scheme.

However, information provided by DFAT on the internet contains the following on the 93 + 2 safeguards programme (now referred to as the Strengthened Safeguards System) which the IAEA finalised last year:

'Programme 93 + 2 is divided into six task areas, with a seventh for overall management and integration of the results. These are:

- * Task 1: Cost analysis of present safeguards implementation
- * Task 2: Assessment of potential cost saving measures
- * Task 3: Environmental monitoring techniques for safeguards application
- * Task 4: Increased cooperation with national and regional safeguards systems, and other measures for improving the cost-effectiveness of safeguards

- * Task 5: Improved analysis of information on states' nuclear activities
- * Task 6: Enhanced safeguards training
- * Task 7: Proposals for strengthening and improving the efficiency of the safeguards system

Key elements of the Programme aimed at development of capabilities to detect undeclared nuclear activities include:

- * Expanded declarations by states of nuclear related activities and plans;
- * Extended access by IAEA inspectors both around nuclear facilities and to locations identified in expanded declarations
- * Use of new technology, particularly environmental sampling and analysis (DFAT, 1998, "Current and Future Safeguards Developments", <www.dfat.gov.au/aso/topics/strength/htm>.)

The above gives something of a new slant to the safeguards debate and it will surprise many to find that so much emphasis is placed on cost-cutting in safeguards work. This is an issue which has concerned many organisations and governments for a number of years. In 1994 at major regional conference on nuclear energy and science, the ASO also had finance as a central theme in its paper. (Barsley, J., Carlson, J., and Hill, J. (ASO), 1994, "International Atomic Energy Agency - Safeguards After Iraq - some Australian perceptions", pp.831-835, 9th Pacific Basin Nuclear Conference, Sydney, May 1-6.)

Indeed many of the issues raised in both Anderson's and the ASO's papers relate not to increased *technical* input, but increased inspector access and increased funding for the IAEA and the ASO itself. As the ASO Annual Report for 1995-96 noted, there is a continued evaluation of new safeguards technologies, increases in nuclear facilities and quantities of nuclear materials and increasing safeguards complexity of nuclear technologies such as large through-put spent nuclear fuel reprocessing plants. Those factors combined with zero growth budget for the past ten years, have certainly not made the IAEA's work any easier.

One measure of the IAEA's approach to safeguards is how much resources are dedicated safeguards and non-proliferation work. In 1993 the following figures were given for the breakdown of the IAEA's expenditure:

- * 35% of the Agency's programmed regular budget will be spent on activities relating to the operation of the international safeguards regime.
- * 6% will be spent on administration of the Agency's technical assistance and cooperation programs, funding for which is provided separately
- * 15% will be spent on the Agency's nuclear energy and safety programs
- * 15% will be spent on the Agency's research and isotope programs; and
- * 29% will be spent on management and administration programs and the cost of the policy making organs of the Agency, being the annual General Conference and the quarterly meetings of the Board of Governors. (Minister for Foreign Affairs, response to Senate question upon notice No.572 from Senator Coulter, September 6, 1993.)

For many years the percentage of the IAEA's expenditure on 'promotional work' was greater than that indicated by the above figures. Although DFAT has expressed its irritation at claims that Australia spends too much on the promotion of the nuclear industry. The crisis in Iraq made a lasting change to the IAEA's approach to spending and that is to be welcomed (albeit that it took a major international crisis to do so). However, it is valid to query the spending on nuclear activities by

Australia and the IAEA, for if there are concerns that there is not enough money for the inspection work expected of the IAEA and the ASO then surely all expenditure on 'promotional' work should stop.

The Senate Committee should ask what does a "zero growth" budget really mean for safeguards work? As Anderson noted in 1997 "many commentators see budget limits as the biggest current restraint on the IAEA's effectiveness." In the same paper it was noted, "in practice, actual routine inspection effort is kept to the minimum consistent with the agency's responsibilities." (Anderson, David, 1997, "Nuclear Safeguards", p.210.) This remark needs to be explained more fully. Does this mean the IAEA *deliberately* limits its work to the minimum number of inspections required for all countries and all sites? Or is the Agency restricting its inspections in order to avoid accusations of being overly-interfering? If, however, the IAEA is only able to meet its minimal obligations because of budgetary constraints, then the Senate Committee should be aware of this shortcoming.

The issue of inspections and funding is one which rightly gives rise to concern. For example, between 1981 to 1994 the amount of nuclear material under safeguards grew by 400 %. In real terms it means that in 1981 US\$2,200 was spent per 'significant quantity' of nuclear material*, whereas by 1993 that amount had dropped to US\$850 per SQ. (Greenpeace International, 1995, "An impossible task - the failure of safeguards", Amsterdam, Submission to Main Committee III of the Review and Extension Conference of the NPT.)

(A significant quantity is defined by the IAEA as "the approximate quantity of nuclear material in respect of which, taking into account any conversion process involved, the possibility of manufacturing a nuclear explosive device cannot be excluded". E.g. for highly enriched uranium this is 25 kg.)*

The ASO is also having to keep track of an increasing amount of Australian Origin Nuclear Material (AONM) in circulation. Again, this is being done on a less than adequate budget - the ASO's 1996-97 report notes that uranium companies only supply 40% of the ASO budget. In 1997 the level of staffing for the ASO was nine, but the ASO, in its 1996-97 report, refers to an external review which said that 14 staff was the minimum requirement. (The Nethercote Report, 1989, for the Australian Government.)

In 1996-1997 the public relations budget alone for ANSTO was \$243,500 (rising to \$483,500 in 1997-98 to include for open days and additional community information programs associated with the government's decision on a replacement reactor). (ANSTO, evidence to the Senate Economics References Committee, May 11, 1998.) In 1996-1997 the Australian Safeguards Assistance Programme had a budget of approximately \$200,000. (Australian Safeguards Assistance Program involves research and development projects and other activities undertaken in support of IAEA safeguards. See ASO Annual report, 1996-97, p.99.)

How can this be justified? If there is money to be spent on nuclear projects perhaps it would be best spent in other areas than public relations. There are no figures available for how much money is spent on the promotion of alternative nuclear technology, such as cyclotrons. Consideration needs to be given to the exact nature of safeguards work as well as the financial support such work received. As the IAEA notes:

"ultimately the strength of the safeguards system depends upon three interrelated elements:

* *The extent to which the IAEA is aware of the nature and locations of States' nuclear and nuclear related activities*

* *The extent to which IAEA inspectors have physical access to relevant locations for the purpose of providing independent verification of the exclusively peaceful intent of a State's nuclear programme;*

* *The will of the international community, through IAEA access to the United Nations Security Council, to take action against States that are not complying with their non-proliferation commitments." (IAEA website, 14 May 1998, "How has the Safeguards System Been Strengthened".)*

The second and third points are primarily political issues, particularly those of access to nuclear facilities. Are these initiatives getting the financial backing they need? However, those areas of safeguards which *are* technical in nature many are not reactor based. Indeed, for the analysis of environmental samples from around sites ANSTO does not utilise the reactor, but the tandem accelerator at Lucas Heights. (Tuniz, C., and Hotchkis, M.A.C., 1997, "Accelerator Mass Spectrometry to identify signatures of nuclear activities", ANSTO, Presented at International Workshop on the Status of Measurement Techniques for the Identification of Nuclear Signatures, IRMM, Geel, Belgium, February 25-27.)

The new reactor will not change this situation. The director of ASO has, however, stated that it believed that it is the broad range of multi-disciplinary work at Lucas Heights which is necessary for safeguards work as well as the measurement of environmental samples. Still, director of the ASO has said:

"A research reactor in itself doesn't have a direct connection to safeguards, but through the ability to train people and to get people used to handling nuclear materials and to understand reactor functioning, that certainly gives important foundation to our knowledge of nuclear issues." (John Carlson, ASO Director, "Background Briefing, ABC Radio National, 29 March 1998.

<www.abc.net.au/rn/talks/bbing/bb980329.htm>

There are other points to note here. Firstly, environmental sample analysis can and does take place at facilities where there are no reactors and non-reactor based scientists. (Boikat, U., et al., 1985, "Radioactive Levels in Environmental Samples from the Sellafield Area / Cumbria, GB", Institute for Energy and Environmental Research, University of Bremen. Presented at the 18th Midyear Topical Symposium of the Health Physics Society, Colorado, January 1985.)

Reactor training is not *absolutely* essential to understanding fission product signatures; much of the information on this is already known to the nuclear/scientific community and is known to university research departments. Even if a reactor were essential, there are far better facilities to train on overseas than a small research reactor (the parameters of which are still undecided). It is also questionable as to whether training on a research reactor is really the best way to gain a true understanding of the proliferation potential of a nuclear power reactor or larger research reactors (more than 30MW).

It is believed that perhaps the most effective way to understand the proliferation potential of different reactors is to have on-site experience to understand the burn-up rates in fuel for plutonium production, the fuel discharge mechanisms and so on (many of these are already well established and are part of what informs the IAEA inspection teams and the annual audits on nuclear programmes). Australia should, therefore, consider sending scientists overseas for their primary

reactor and proliferation training, and not pretend that a research reactor is a suitable alternative to such experience. The ASO insists that without reactor training here in Australia, overseas agencies might not feel inclined to allow access to Australian scientists for non-proliferation cooperation and that some countries might only agree to allow their facilities to be used for training only if they can send people here for training. (Interview with John Carlson, ASO Director, for a report for Sutherland Shire Council, J. McSorley, September 1997.)

Surely this raises question on what Australia negotiates as a fair "return" for access to nuclear facilities overseas and is another issue which should be discussed further. ASO and ANSTO would doubtless argue that no overseas training would be countenanced without Australian technicians and scientists first learning the absolute basics on a reactor here in Australia. Whilst that argument may have some merit, is the overall cost - and that includes the opportunities lost in other sciences and the proliferation and environmental problems of the reactor itself - worth it for training scientists for safeguards and non-proliferation work? Could such work not be undertaken elsewhere, does it have to be reactor based?

What nuclear facilities are engaged in can be monitored in a number of ways - by direct observation (e.g. fuel time in a reactor) and audits of fissile materials. For example, the increased use of video surveillance on spent fuel stores or reactors is one of the target areas for improvement for the IAEA and is not reactor dependent. Even that work which was initially reactor dependent may not need a facility in order to pass on the knowledge gained from the original research. As the ASO's 1995-96 report notes, the use of telecommunications systems linked to surveillance systems to send 'real-time' information to the IAEA could significantly enhance the agency's ability to meet timeliness goals and possibly offer substantial savings and benefits in terms of effectiveness. However, to build up such a network and to gain acceptance of such equipment at sites is something which the IAEA also needs funding for. What impact will funding the new reactor have on other nuclear technologies used for safeguards which the ASO is taking part in developing? What would be the total cost of these other technologies?

Whilst money is going into ANSTO to provide for the new reactor, questions should be asked if there are 'safeguards' jobs at risk from cut-backs in DFAT/ASO? The Senate should ask exactly where the majority of Australian effort in the non-proliferation field currently takes place and if it is reactor dependent and whether or not those areas of work will be maintained or should be increased due to non-proliferation needs in general and uranium sales in particular?

With regard to uranium sales, it should be noted that over the years the main focus on safeguards work has been the security of fissile material (weapons-grade and weapons-useable plutonium and highly enriched uranium) not nuclear technology. As the example on large-scale reprocessing plants explains (see pages 20-22 for further discussion) there is a very real need to instigate and fund complete inspection regimes on such facilities. This is part of a recurring theme throughout the history of safeguards - ensuring the right amount of resources into securing and supporting the safeguards system which is already in place. Political support is also essential in the non-proliferation field.

Safeguards work would also be more effective if the UN pressured national governments into adequately policing agreements on technology transfer. For example, had the western states applied technology transfer controls effectively through the Nuclear Suppliers Group (NSG), Iraq might not have got as far as it did with its illegal nuclear programme. (The Nuclear Suppliers Group is a

voluntary grouping of 28 countries. Following Iraq they agreed to increase the level of notification of technology transfer to the IAEA. However, there are 182 NPT signatories which have an "inalienable" right to nuclear technology. The gap between the number of NSG members and the number of NPT signatories who might access nuclear technology is very substantial.)

Certainly, had prosecutions taken place of the companies which allowed the transfer of sensitive nuclear technology then it would have sent the right signal to other nuclear vendors not to follow suit.

Interestingly, despite all the claims put forward, DFAT/ASO have hedged their bets on the reactor. Whilst supporting the proposal they have also noted, "We have not said that the major reason for the Government's decision to have a research reactor relates to the issues that I have addressed today - they are benefits of having a reactor, and that is what we have sought to identify today and in our submission. So I cannot say that was the major reason." (DFAT/ASO, Senate Evidence, 11 May 1998, E151.)

National interest concerns are, however, the reasons which top the list for the reactor in ANSTO's Strategic Plan 1996/97-1999/2000. Moreover, as the medical and scientific arguments for a new reactor are extremely weak (as discussed in submissions to the Senate Economic References Committee by Dr. J. Green), this lends weight to the view that "national interest" considerations *are* the key factors in this debate.

There will be some people for whom continued support even for the IAEA safeguards regime - let alone a reactor - is not acceptable. That is because there is much cynicism regarding the effectiveness of safeguards. This is, in part, due to the overly emphatic assurances which have been given in the past as to the effectiveness of safeguards in order to gain acceptance of nuclear activities (such as uranium sales). Certainly, there are many instances when safeguards have failed. The nuclear weapons states and some non-nuclear weapons states have broken NPT/safeguards agreements both domestically and through international trade and aid. Despite these understandable concerns it is felt, however, that the safeguards system needs support and should be maintained and improved.

However, support should first be given to those areas of the ASO's work which reduce or eliminate dependence on reactors (or other dual-use technology). Stepping away from reactor technology, and utilising non-dual use technology to the fullest extent for safeguards, could really help boost Australia's standing in the international community. The calls for a new reactor linked with ANSTO's activities in the region, coupled with the uranium industry, fuel public concern that other matters are taking precedence over safeguards and non-proliferation work.

One final point on this. ANSTO has allowed the current reactor at Lucas Heights to be used as part of non-proliferation experiments, but these do not justify a new reactor. The use of an already existing facility in developing "inspection rights" for the IAEA is not a reasonable argument for a new reactor *per se*. Such inspection exercises hardly represent the *real politik* that the IAEA has faced in Iraq or North Korea. If a country is intent on keeping most of its nuclear operations secret, or is prepared to lie about them, then how access is gained to suspected nuclear facilities or the area around them then becomes the central issue - and is one which is essentially political in nature.

The Board of Governors of the IAEA

In 1993 the Research Reactor Review (RRR) noted: "There was no evidence before the Review sustaining the view that permanent membership of the Board of the IAEA is crucial to advancement of Australia's national interest." (Research Reactor Review, 1993, "Future Reaction", 9.4 Summary of Principal Conclusions, p.xix.)

In 1998, DFAT/ASO (Senate Submission, Vol.2, p.460.) stated:
"the continued operation of a major research reactor is *probably* the minimum requirement for Australia to maintain *credibly* our *claim* to a regional seat." (emphasis added)

DFAT/ASO (Senate Evidence, 11 May 1998, E155) also claimed that the designation of seats on the Board of Governors (BoG) of the IAEA relates not only to how advanced the technology is in any given state, but also includes the production of 'source materials.' However, they also went on to reiterate that uranium (as a source material) is a subset, with the "advancement in the technology" being "the major concern."

Is it then that the BoG position is in itself worth the price of a new reactor? Or is it that current and proposed uranium sales continue to tie Australia to the nuclear industry and therefore provide an ongoing justification for being on BoG of the IAEA? Uranium sales and the need to safeguard nuclear materials have been invoked as a reason for having a reactor. DFAT/ASO (1998, Senate Submission, Vol.2, p.460) claimed that:

"a technical knowledge of the nuclear fuel cycle of related issues, such as nuclear safeguards, is an essential underpinning to Australia's uranium exports and nuclear cooperation policies. It (the reactor) provides the basis for continued Australian access to the latest nuclear technology and thus reinforces the worth of Australia as a useful partner in international and regional nuclear cooperative activities."

Has the circle come full turn? Australia got into the IAEA (with much US backing) and obtained its first reactor (from the British) because Australia was a source of uranium for weapons. The IAEA position 'obliges' Australia to take part in safeguards and also to sell uranium (stay in the game) and have a nuclear agency (plus reactor) which promotes the technology that uses uranium. The spread of nuclear technology necessitates a new reactor for safeguards and so on, *ad finitum*, until someone breaks the circle.

Where exactly does ANSTO sit in all of this? Currently DFAT/ASO claim the very people to best judge the reactor proposal and to run it are the people whose careers and livelihoods depend on it. ANSTO, however, is an organisation which is "part of an industry deeply committed, both emotionally and career wise, to the expansion of the global nuclear industry." (Greenpeace Australia, 1993, submission to the Research Reactor Review.)

ANSTO's judgement is inherently biased because of the work the organisation does. Similar criticisms should also be laid before a number of bureaucrats and officials, whose attitudes were shaped during a time when it was thought a good idea for Australia to have nuclear reactors and/or nuclear weapons defence. Indeed, for some of these people the idea of utilising alternatives to a reactor might be a challenge to ideas and suggestions they are already with linked. As such people are often crucial in policy making it is important that they, too, are questioned. For anyone, however, to suggest that ANSTO in particular is a good source of *independent advice* on the need for a reactor,

and the wider nuclear industry it serves, is totally untenable and must be challenged. DFAT/ASO (Senate Evidence, 11 May 1998, E156) perhaps unwittingly alluded to this self-interest when they noted that holding a designated seat on the IAEA BoG is:

" a combination of both and other factors including our *contribution to regional cooperation* and our *willingness* to show that we are fulfilling our obligations under the nuclear non-proliferation treaty under which we have undertaken to facilitate cooperation. So it is not one particular factor, but certainly the operation of a research reactor is a major factor in our designation" (emphasis added)

And what of Australia's obligations under the NPT? Because the NPT encourages the spread of nuclear technology, as well as prohibiting the military application of such, does Australia have to attempt to fulfil both aspects of the treaty? DFAT/ASO's Senate Submission (1998, Vol.2, p.459) makes many points concerning the input Australia makes to non-proliferation strategies and that these are based on "Continued and long term investment in expertise by Australia if it is to remain an influential and constructive international and regional player." What does this mean? Whose definition of influential and constructive is being used? What sort of influence should or could Australia be exerting? Might it not exert more influence on non-proliferation through encouraging non-reactor technologies for medical isotope production, science and electricity generation?

It might also be worth asking DFAT/ASO if there is ever any discussion within the IAEA as to whether seats on the BoG might be awarded to countries which have done work on negating the spread of dual-use nuclear technology. Should a designated seat be awarded instead to the country which contributes the most to diplomatic efforts on non-proliferation, rather than those countries which promote the nuclear industry?

As DFAT/ASO claim (Senate Evidence, 11 May 1998, E156), there is no weighting between the role of a reactor and the role of Australia as a source of nuclear material in terms who gets on the IAEA BoG, as who gets on the BoG "is a judgement made by the existing board of governors". How, then, are judgements made on those countries which do not contribute technology or source materials to the nuclear industry? Are these the countries whose membership the BoG deliberately limits to the rotating two-year terms? Is the BoG a nuclear club from which Australia fears it might be blackballed if it doesn't wholeheartedly support every aim - not matter how questionable or contradictory those aims are?

These are important questions because, for the first time in almost fifty years, Australia is in an ideal position to take a positive step in non-proliferation by saying "no" to reactor technology and by challenging the *modus operandi* of the IAEA. Is the government willing or capable of grasping this opportunity?

National Security blanket?

The idea of not having a reactor appears to be an anathema to most government officials. Much is made in the DFAT/ASO submission of the need for 'independent' analysis "to avoid dependence on foreign intelligence assessments in the field of nuclear proliferation." How many of Australian "chaps" does Canberra need at the IAEA in order to secure our "very own" information? Why is it that Australia is reluctant to rely on some countries for information on nuclear matters? Who don't we trust? The US, under whose nuclear umbrella we shelter? Euratom, to which we entrust so much of our uranium? Our regional nuclear cooperation partners, with whom we train?

If independence in such matters is so important to Australia, is it the intention to replicate every aspect of the nuclear fuel cycle through which Australian uranium is processed? Where might this line of thinking lead us? Should Australia have uranium enrichment plants, spent nuclear fuel reprocessing facilities and a bomb factory? How much should Australia replicate in order to train people to detect proliferation activities overseas? Thankfully this line of thinking was not applied to Australia's work on the Chemical Weapons Convention.

In relation to the issue of intelligence gathering, questions have been asked as to whether the work currently undertaken by DFAT/ASO could have helped in foreseeing the nuclear testing recently undertaken by India and Pakistan (there is still much conjecture as to what was known beforehand and what was not known and by whom). Perhaps a key point to note is that even if IAEA inspectors had had access to all Indian and Pakistani sites, safeguards inspections could not have prevented the diversion of nuclear materials for weapons purposes. Countries suspected of being in breach of safeguards are referred on to the UN Security Council. The IAEA does not have supranational powers to take immediate action to prevent diversion of fissile material to a weapons programme (the current impasse in Iraq is an example of the problems it faces even when it does get UN backing). However, all of this is something of a moot point with regard to India and Pakistan, as neither country is a signatory to the NPT or CTBT, nor are they party to safeguards arrangements on the relevant nuclear material and weapons facilities.

However, in terms of ANSTO's role in relation to the nuclear testing in India and Pakistan, it is worth noting that in evidence to the Senate Committee, ANSTO conceded that Australia had not been undertaking training programmes with India or Pakistan in recent years. (Prof. Helen Garnett, ANSTO, evidence to the Senate Economics References Committee, 11 May 1998.)

India and Pakistan are not members of the International Conference for Nuclear cooperation in Asia (ICNCA), which was established in 1990 for NPT states. Thus the two 'threshold' states in the region were either exempt from safeguards or excluded from the sort of enhanced joint cooperation which is thought important to non-proliferation aims (and intelligence gathering).

More importantly, many security specialists argue that a country's push for nuclear weapons may over-ride concerns over being "caught out." States which believe their security is threatened may act in what appears to be a reckless manner in order to procure or ensure their national security. With regard to this, non-proliferation is more than just focussing on the ability to detect nuclear weapons programmes - it is also about encouraging countries not to take that route, it is about creating an environment where nuclear weapons are not seen as a threat or as politically desirable. Other 'security' issues need, therefore, to be taken into account, such as the security assurances that countries look for which might encourage them not to pursue nuclear weapons. Such assurances have not been forthcoming. Despite 'no first use' pledges by the nuclear weapons to non-nuclear states, there are still many other related issues which have to be resolved.

The failure of the nuclear weapons powers to disarm has done nothing to encourage faith in the NPT. Setting a time-line for disarmament at the NPT and pressuring the weapons powers into dismantling their arsenals, are the sorts of assurances that non-nuclear states want to see and have every right to expect. As it is, the lack of action by the nuclear weapons states has provided both India and Pakistan with the opportunity to claim that they, too, have every right to have nuclear weapons if other countries have them. The insistence of the five weapons states - that they are the

weapons states because the NPT says so - is mere sophistry. The five weapons states set up the NPT so they would be the only 'legitimate' weapons states. In 1995 they railroaded many other NPT countries into accepting that position. The actions of India and Pakistan, which never signed the NPT, could be said to be more consistent than those of the nuclear weapons states who continued to build and maintain their arsenals in spite of the NPT which states they should disarm. The five nuclear weapons states - China, France, Russia, the UK and the US, are not alone in their culpability over this matter.

In 1995 Australia endorsed the *unconditional* and *indefinite* extension of the NPT - an act not divorced its defence agreements. The outcome of the NPT conference set in stone the five nation nuclear weapons club - in direct breach of Article 6 of the NPT which calls for disarmament. There was no pressure from Australia on the nuclear states to disarm. In fact Australia accepted without challenge the 'no change' stance taken by the five nuclear weapons states. At the end of the conference the Malaysian delegate summed up the views of many countries when they noted, in the closing session of the 1995 NPT Review Conference, "Let us state at the outset, that indefinite extension does not have the consensus of the conference. We would have preferred a secret ballot and believe that the outcome would have been very different if countries had voted with their hearts ... Indefinite extension is a carte blanche for the nuclear weapons states and does not serve as an incentive to nuclear disarmament ... we are abandoning an historic moment to free ourselves from nuclear blackmail and to safeguard future generations."

Five years later the media, once wooed into accepting an unaltered NPT as a 'good thing' have now seen through the deceit. As the two attached articles show there is now widespread questioning of the nuclear weapons states and their future intentions on disarmament. ("Asia: Nuclear Club's outrage exposes its hypocrisy", Business Times, Singapore, 2/6/1998; "Our bomb is sacred, theirs is a disgrace. That's hypocrisy", The Guardian Weekly (London), 7/7/1998; "Nuclear five told to keep their word", Agency France Press, reported in Sydney Morning Herald, 8/6/1998.)

Questions have been asked as to the impact the five weapons states continued possession of nuclear weapons has had on encouraging nuclear proliferation (and the role of countries like Australia which supported them). This is an important issue to raise at such a vital juncture, for doubtless there will be those who will use the Indian and Pakistan tests to increase the pressure to have a new reactor because of national interest/national security reasons. It still remains that work on national security related to this now depends more on diplomacy than technical advice. (Interestingly, the Guardian Weekly on 1/7/1998 reported that one of the responses of the US administration to the Indian and Pakistan nuclear tests has been to increase the budget for the CIA to hire more spies.)

However, the nuclear weapons states are not helping matters. Continued nuclear weapons testing, through hydro-dynamic nuclear tests by the US, or through computer simulation by France and the UK, also undermine the intent of the Comprehensive Test Ban Treaty (CTBT). China continues to develop weapons.

The continued presence of nuclear weapons, and the political power they give the nuclear weapons states, does nothing to reduce the desirability of nuclear weapons. As International Physicians for the Prevention of Nuclear War (IPPNW) have noted: "By remaining steadfast in their commitment to nuclear weapons as an integral part of their defense policies, the nuclear weapons states are sending the message to the non-nuclear states that nuclear weapons are legitimate, indeed necessary

and desirable instruments of military power. Combined with a lack of adequate safeguards for fissile materials, and the increasing spread of the knowledge and technology needed to make nuclear weapons, the threat of nuclear proliferation is real and imminent." (IPPNW Abolition 2000 Newsletter, "A new dimension to the nuclear threat", 1997.)

The IPPNW article was, in fact, referring to the increased possibility of proliferation via terrorist organisations. However, since the article was written a proliferation of nuclear states - in India and Pakistan - has already shaken the world. How much effort is Australia putting into confidence-building measures in the region, through adherence to nuclear free zones, subregional multilateral arms control regimes, or subregional fora such as the ASEAN Regional Forum which are recognised measures in decreasing tension and proliferation. (See Mack, A., 1997, "Potential, not Proliferation", Bulletin of the Atomic Scientists", July/August, pp.48-53.)

How much more effort could be put into this type of work? Where would Australia's money be best spent on non-proliferation? By pressuring the nuclear weapons states into disarmament or continuing to encourage technology which is part of the problem? (For details on how research reactors, power reactors and 'civilian' plutonium have been utilised in nuclear weapons programs see International Physicians for the Prevention of War, MIT Press, 1995, "Nuclear Wastelands".)

Is a new reactor really the best way to ensure energy and funding is put to the best use in the field of non-proliferation? Should not Australia instead be promoting non-reactor technology and supplying greater resources directly to the IAEA for increased inspections?

Transparency

Being a promoter of nuclear technology, a member of the IAEA, a signatory to the NPT and a major supplier of uranium places a special onus on Australia. Transparency in its nuclear dealings is one such matter. It is important, therefore, to consider the nuclear agreements which Australia is a party to. Australia is a member of a number of committees on the IAEA, such as the Standing Advisory Group on Safeguards Implementation (SAGSI). Australia is also signatory to 14 bilateral nuclear agreements with 24 countries. Whilst most of these cover the transfer of uranium some of the work undertaken through the agreements comes under the auspices of IAEA's 17 nation Regional Cooperation Agreement (RCA). (Australia, Bangladesh, Burma (Myanmar), China, India, Indonesia, Japan, Malaysia, Mongolia, New Zealand, Pakistan, Philippines, Singapore, Sri Lanka, South Korea, Thailand, and Vietnam.)

The RCA has been invoked as important in relation to the need for a reactor inasmuch that Australia needs a reactor, it is claimed, in order to take part in the agreement (Australia provides ANSTO staff to coordinate the RCA).

The claim has been made that if Australia fails to have a nuclear reactor then the necessary expertise for such a position will disappear (along with the influence such a position confers). However, that also implies that there is no other role for Australia in safeguards or non-proliferation work, and that there are no other scientific disciplines apart from those which are reactor based which have any worth in such discussions. It should be noted that there are IAEA member states which do not have nuclear reactors, such as Ireland, do play a vital role in non-proliferation objectives through promoting nuclear weapons abolition.

Despite the impression given, the agreements do not tie Australia into reactor technology per se. In response to a question on this issue in 1994, the government admitted that Australia could still meet its obligations under the RCA without having a reactor although it is felt its role might be diminished without such a facility. (Minister for Foreign Affairs, response to Senate Question No.1319 from Senator Coulter, on notice 14 April 1994.) The same parliamentary response also noted that none of the RCA projects were centred on accelerator technology in Australia - that is non-reactor technology. It appears then that the RCA programme is structured so as to make the reactor the *key* piece of equipment in terms of collaboration on nuclear technology. Given what is now known about cyclotrons for medical isotope production, and the work of other nuclear technology in safeguards (accelerators), there must be questions raised as to why these technologies have not been promoted through the RCA's work. Is Australia missing an opportunity for non-reactor cooperation with neighbouring states? Or it is deliberately avoiding such cooperation. For there is another aspect to the agreements which also needs to be taken into account. As the National Interest Analysis on the agreement with South Korea notes, that agreement will also "enhance Australia's competitiveness in bidding for ROK uranium contracts." (National Interest Analysis on Exchange of Notes, done at Seoul on 11 August 1997, constituting an Agreement between the Government of Australia and the Government of the Republic of Korea, 26 June 1998.)

Is the reactor and the agreements it part facilitates part of the sales pitch for private uranium companies? It is this sort of question which makes it imperative that such agreements are discussed before they are signed, unfortunately that is not the situation at present.

Uranium sales notwithstanding, scientific cooperation alone will certainly not resolve the major problems relating to the potential proliferation aspects of agreements. As noted earlier in this paper, most of the problems raised under the new safeguards regime following the Iraqi scandal are of a diplomatic nature. How Iraq avoided proper inspections, and how sales of technology went ahead against the IAEA regime, cannot be answered by a new reactor but by transparency in other areas - and through thoroughly examining the impact of agreements and by then ensuring enough support is given to the work that is needed. The rights and access of bona fide IAEA inspectors to ensure agreements are adhered to (as opposed to scientists picking up on perceived deficiencies) are matters for the IAEA member states to resolve and oversee collectively. It should also be remembered that those countries which are pursuing illicit nuclear programmes will not readily open up to scientific cooperation any more than they would readily open up to IAEA inspection.

The issue of how non-IAEA intelligence - that is information gathered outside the usual channels - might be used to trigger an inspection was a major bone of contention throughout the talks on strengthening the IAEA safeguards regime. Whilst the exact method and channels of intelligence transfer is bound to remain secret, it is a point worth mentioning. How would staff, previously trusted by an overseas nuclear agency, be treated if they were suspected of whistle-blowing? ANSTO have yet to answer how staff might be used as *de facto* intelligence agents. How can a research scientist working on an overseas reactor effectively communicate proliferation concerns without 'revealing' his/her self? Does this really add to transparency - or continue an unhealthy cat and mouse approach to nuclear activities?

Whilst transparency is recognised as an important issue in international nuclear relations, it is also an issue which should apply nuclear matters which are decided internally. Since Australia first became involved in the nuclear industry the level of transparency over nuclear activities has never

lived up to the expectation of the Australian public or Parliament (although improvements in certain areas in recent years, such as the ASO's Annual Reports, have been noted).

Nuclear agreements which may obligate Australia to have a reactor, which encourage the spread of dual-use technology or allow for nuclear material transfers with other countries, are not even discussed in either the House of Representatives or the Senate *before* they are signed. The Indonesian nuclear science and technology agreement is a good example of this. (Agreement between the Government of Australia and the Government of the Republic of Indonesia concerning Cooperation in Nuclear Science and Technology, 11 November 1997.)

This agreement, signed in November 1997, was never discussed before it was signed. What are the full implications of such an agreement? Should it have been signed before it was discussed? (This matter is discussed in detail on pages 29-31).

Japan and Plutonium Transfers

A recent agreement concerning the transfer of plutonium reprocessed from Australian Obligated Nuclear Materials (AONM) from reprocessing plants in Europe to Japan (under Euratom supervision) provides an example of the lack of transparency in decision making on Australia's nuclear agreements. In recent years there has been much discussion on the Japanese nuclear programme. The stockpiling of weapons-useable and weapons-grade plutonium by Japan - for use in its fast breeder reactor programme - has been the subject of debate between security analysts, environment and peace groups and a number of governments in the region. (Greenpeace International, 1993, "The Plutonium Trade: A Troubling New Era of Proliferation".)

Japan's plutonium is separated at Sellafield (UK) and La Hague (France) spent nuclear fuel reprocessing facilities. A small reprocessing plant operates in Japan at Takai Mura, a large-scale commercial facility is also planned for Rokkasho-Mura. The US banned the commercial reprocessing of spent nuclear fuel because of environmental and proliferation concerns.

In 1992, when the *Atkatsuki Maru* took the first shipment of plutonium from France to Japan, representation was made to the Australian government on this issue. The official response at the time was that so long as Japan only holds enough separated plutonium for peaceful purposes (as defined by Japanese reactor programmes) then the Australian government would have no reason to express concern. (J. McSorley, notes on interview with officials from DPIE and DFAT, 1992.)

Although the agreement which covered the transfer been signed ten years earlier, during which must had changed for Japan's nuclear industry, the Australian government saw no reason to question it. However, it was said that if circumstances changed, and if it appeared that Japan might be stockpiling plutonium beyond the needs of its expected civil programme, then the Australian government could question plutonium transfers and - presumably - halt them.

Since 1992, however, circumstances have changed. North Korea has used the stockpiling of plutonium by Japan as a justification, and incitement, for its own nuclear programme. The Monju fast-breeder programme and associated plutonium projects in Japan, have almost ground to a halt. What, then, is the intended use of the plutonium earmarked for that programme, or resulting from it? Is there a problem in allowing the further transfer of plutonium to Japan?

Given the above, the Australian public might have expected their elected representatives to have had some debate in any renewal of the agreement to permit the continued transfer of plutonium from AOMN. Plutonium produced for power programmes is - despite claims to the contrary - weapons useable. There is no question that reactor-grade plutonium can be used in nuclear weapons, this has been known for some time and is clearly explained in a number of reports from specialists. (See Greenberg Eldon, V.C., 1993, "The NPT and Plutonium - Application of NPT Prohibitions to 'Civilian' Nuclear Equipment, Technology and Materials Associated with Reprocessing and Plutonium Use", Nuclear Control Institute, Washington DC. Albright, D., 1984, "Can Civilian Plutonium be used in nuclear explosives?", A Review of Statements by Nuclear Weapons Experts, Federation of American Scientists, Washington. Copies of these reports were given to the Senate Select Committee on Uranium Mining and Milling in 1996).

A recent review of the Indian and Pakistani nuclear programmes in Jane's Intelligence Review recently reconfirmed this view. (Steer, I., "Canada: Asia's rival reactors a cause for concern", Jane's Intelligence Review, 1 October 1998.) In fact in 1992 the Deputy Director-General of the IAEA, William Dirks, told a conference in Japan that:
"although plutonium from power reactors tends to be impure ... and not ideal for nuclear weapons fabrication, it can nevertheless be used for this purpose "In the practise of the Agency, the term nuclear weapons-useable materials means fissionable material which could be used in the manufacture of a nuclear explosive device, including separated plutonium." (Dirks, W.J., 1992, "Nuclear Fuel Recycling - the IAEA perspective", paper presented to the Japan Atomic Industrial Forum, 13 April.)

The spread of commercial nuclear reprocessing and plutonium extraction from spent fuel through reprocessing operations is, therefore, of serious concern and cannot be dismissed. In 1990, the Nuclear Control Institute made three main points on this matter:

1. Over a year, the usual reporting period to the IAEA, several 'significant quantity' amounts of weapons-useable reactor grade plutonium could be diverted from reprocessing facilities. (A significant quantity is defined by the IAEA as "the approximate quantity of nuclear material in respect of which, taking into account any conversion process involved, the possibility of manufacturing a nuclear explosive device cannot be excluded". For reactor grade plutonium this amount is approximately 8 kg.)
2. Even if the reporting and inspection periods were lessened to one month, an amount of plutonium sufficient for a bomb could still be diverted.
3. Remote surveillance equipment is still not sufficient to safeguard against 1 and 2 occurring because of the time lag between suspecting an infringement and exercising the right to carry out an inspection based on non-compliance suspicions. (Miller, M.M., 1990, "Are IAEA Safeguards on Plutonium Bulk Handling Facilities Effective", Nuclear Control Institute, Washington D.C.)

Because of the large amounts of material involved, and due to the inaccuracy in assessing how much plutonium is actually in the spent fuel fed into a reprocessing plant, there is potential for large margins of error, particularly through protracted diversion. The physical complexity of reprocessing facilities adds to these problems. One further problem is that much of the accounting for nuclear materials is validated through the audits of national nuclear agencies, not through direct observation and testing by IAEA inspectors.

The Nuclear Control Institute's paper, although written in 1990, foreshadowed some of the additional controls being put into place by IAEA at present. These increased safeguards via surveillance and inspections - discussed *prior* to the Gulf War - arose due to growing concerns over the potential for plutonium diversion from large-scale facilities.

Despite all of the above, the decision to renew the agreement allowing separated plutonium derived from AONM to go from European reprocessing plants to Japan was made in May - at the height of the controversy over nuclear testing by Pakistan and India. ("Australia-Euratom Nuclear Safeguards", Reuters Business Briefing, 10 July 1998.) There is little doubt that bureaucrats and diplomats from those countries, and other Asian nations, will be aware of the extension of this agreement. Concerns have been raised that the Indian and Pakistani nuclear programme, along with the Chinese nuclear and conventional weapons build-up, might encourage the pro-nuclear forces in Japan to press for Japan to gain nuclear weapons. Indeed, the IAEA has warned Japan that stockpiling, albeit for peaceful purposes, could lead to perceptions of a nuclear weapons programme by Japan. ("IAEA warns on Japan's plutonium", New York Times, 20 April 1992.) Remarks made by Japanese cabinet ministers in the past have also raised concerns that Japan might build nuclear weapons. (Greenpeace Japan, 1993, "The Plutonium Trade: A Troubling New Era of Proliferation".) It is recognised that Japan is capable of constructing nuclear weapons. Thus, while it is not a nuclear weapons state, Japan is a nuclear-weapons-capable state. Articles on reports from the Minister of Defence in the UK explain some of these concerns. ("Japan to 'go nuclear' in Asian arms race", The Times, 30 January 1994.) By the year 2010, Japan could have a stockpile of plutonium in excess of 70,000 kilogrammes. (Greenpeace Japan, 1993, "The Plutonium Trade: A Troubling New Era of Proliferation".)

It is, of course, not only Japan which deserves a mention in respect to concerns of plutonium use. Many other countries, (e.g. Germany), are also be considered to have the necessary technology and materials to make nuclear weapons. Other regional states - Taiwan and South Korea - have already been criticised for having clandestine nuclear programmes (in the case of South Korea its programme was only abandoned in 1992). However, Japan, its plutonium transfers and stockpiling and the agreement Australia has with it, serve as a good example of the lack of transparency over nuclear deals in the region.

Surely for Australia to countenance the continued separation and transfer of large amounts of weapons-useable material must undermine Australia's claims to be at the forefront of non-proliferation efforts? What if other uranium-customer countries, such as South Korea, asked for their spent nuclear fuel to be reprocessed and for the separated plutonium to be returned? How would Australia react? The Japanese-Australian agreement sends conflicting signals to the regions and raises many questions. This very issue was raised in Anderson's paper when he noted:

"Australia has given consent to the reprocessing of uranium by several countries, including Japan, and the question has been asked: should we continue to give consent to reprocessing which may only contribute to growing plutonium stockpiles? (Anderson, David, 1997, "Nuclear Safeguards", from the Foreign Affairs, Defence and Trade Group, Parliamentary Research Group Report of the Senate Select Committee on Uranium Mining and Milling, Research Papers, Vol.2, pp.216.)

Consent for shipments of plutonium could, in theory, still be questioned. DFAT has said that if there are significant changes in a country's programme (for plutonium use) then Australia could challenge the transfer of plutonium from AONM. (Letter to Greenpeace from C. Shrosbee, Foreign Affairs and Trade, 28 January 1995.) However, it remains to see what the practise will be. Even if the signing of

the latest transfer agreement was not seen as particularly important, it might have provided a suitable opportunity for elected representatives to discuss an issue which is usually left as the preserve of officials. Australia might well support the fissile-materials cut-off treaty which is being promoted as an end to the production of weapons grade plutonium. But the ongoing trade in weapons-useable plutonium undermines these efforts.

Whatever the case with Japan, DFAT's policy on that country alone does not answer other important questions - such as whether Australia should allow plutonium separation by giving permission for AONM reprocessing overseas, or condone reprocessing through seeking contracts for HIFAR's highly enriched uranium fuel rods (with regard to the new reactor, it should be acknowledged that the change to low enriched uranium fuel for the proposed plant should help dampen some proliferation concerns).

If it is accepted that transparency is necessary for all aspects of nuclear safeguards and safety, then that means domestic agencies must be as open as possible with their public and parliamentary constituencies - as open as they expect their overseas counterparts to be with the IAEA.

ACCESS TO NUCLEAR TECHNOLOGY

"The question of national interest focussed on how necessary is it to maintain some degree of nuclear capability to assist the non-proliferation process, to find out what others are doing, or to protect its own national interest *if the occasion demanded?*" (emphasis added)
Research Reactor Review, 1993, "Future Reaction", p.2.

"Australia's strong support for the international nuclear non-proliferation regime as well as our broader non-proliferation and disarmament credentials generates confidence and trust among suppliers of nuclear technology that Australia would not divert any technology provided to it to purposes which are not peaceful."
DFAT/ASO, 1998, Senate Submission, Vol.2.

The Research Reactor Review touched on a sensitive issue in its 1993 report, one which begs the question: how true is it that there is *no* military purpose behind the reactor? The 'national interest' argument is not carried solely on non-proliferation and safeguards matters. Indeed, as raised earlier in this paper, the concept of 'national interest' being synonymous with 'nuclear' security has always been one of the key factors in Australia's involvement in the nuclear industry. For many years the 'national interest' argument for Australian having its own nuclear weapons was openly acknowledged. Though that issue dropped further down the agenda (or is on another agenda altogether) it is still relevant to debate and is an important aspect of the current proposal.

DFAT/ASO give the impression that *all* of Australia's interests, *vis a vis* safeguards and nuclear weapons, are externally focussed - on stopping other countries cheating on the NPT and ensuring other countries honour the IAEA safeguards regime. It is not being suggested in this paper that the Government intends pursuing a nuclear weapons programme itself. However, that is not to say that governments (past and present) have not been concerned to maintain an Australian base of knowledge 'just in case' the need arises for a weapons capability. This is linked to wider concerns of the commitment of the US to the Asia-Pacific in terms of military resources. (See Albinski, H.S., 1990, "The Superpowers in the Pacific", in Ball, D. and Downes, C. (eds.), Security and Defence,

Pacific and Global Perspectives, Allen and Unwin: Australia.)

It is known that the nuclear weapons linkage of Australia's nuclear programme is discussed behind closed doors. If, however, some sort of weapons knowledge 'capability' is behind the current proposal then perhaps the Government should grasp the nettle and state it openly.

By keeping its hand in the game, by participating in nuclear technology transfer, Australia also keeps open the means by which it can gather information on other countries *and* gain technical knowledge which may help in nuclear power or weapons development. However, gaining that knowledge from overseas is not enough for, as DFAT/ASO note (Senate Submission, 1998, Vol.2, p.460), "access to the latest nuclear technology makes Australia a *credible partner* for others and allows Australia to participate effectively as a player in the forefront of technological developments" - a part which demands Australia has a reactor. But who decides what is credible? Why do we have to be at (or pretend to be) the forefront on technological developments? There is, after all, precious little innovation by way of nuclear technology that ANSTO can offer the region. Or is it that Australia is determined to keep its regional seat on the IAEA because it is part of the 'deal' that Australia plays a leading role in the region's nuclear industry and, in lieu of having nuclear weapons, continues to be covered by the US nuclear umbrella?

Taking part in 'overseeing' the activities of other nuclear programmes must meet an objective of the wider security alliance by playing an intelligence-gathering role - a role which the US probably finds it very useful for Australia to play. The pay-back for this is that through its defence agreements with the US, Australia gets to be a nuclear weapons state by proxy. But what if Australia decided to drop its monitoring role, through joint training programmes and the like. How might this impact on its security relationship with the US? What if the US withdrew its military support for Australia - would Canberra start a nuclear weapons programme?

It should not be assumed that any government would, or could, rush into a nuclear weapons programme. A country must first possess the right nuclear materials, highly enriched uranium and plutonium, and enough of them - to make a bomb. In theory Australia has the necessary equipment to separate these materials (at great risk) from the spent nuclear fuel. There is, however, not enough plutonium contained in the fuel rods Lucas Heights for even one weapon. The Government is determined to send the fuel rods overseas, although there is more of a domestic political pressure for this than any over-riding proliferation concern (the recovered HEU will not be returned). Australia would have to develop a missile delivery system if it embarked on a nuclear programme, or else rely on the 'time honoured' method of using aircraft. Testing the nuclear weapons would also present a major technical and political problem. Indeed, whatever the technical problems, the political response to Australia breaking the NPT and the Comprehensive Test Ban Treaty and dishonouring associated promises - as well as risking inflaming a regional arms race - would also be a major governing factor in any nuclear weapons decision. No Australian government would willingly take such a political risk unless all other means of 'protection' broke down - which is why the US treaty is so important. However, there may be those in Canberra who believe that the *notion* that Australia has nuclear-weapons knowledge may help contribute something to the overall deterrence position.

The Government may, however, simply believe it is important to have a reactor so that Australia has a group of scientists who know how to make a bomb as part of monitoring and assessment of nuclear programmes in other countries. Indeed, DFAT officials have described the reactor as 'part of

the national kit' - a very apt description in terms of 'fitting out' Australia in a military sense. However, as other commentators have noted, it is cheaper to kit a diplomat than a soldier (and cheaper than kitting out a scientist too). How much should Australia pay to cover all aspects of 'national interest'? What constitutes 'national security'? Is the reactor, even in part, an answer to any of these major questions? What other ways can traditional security objectives be met without having a reactor? Are there other ways of being at the forefront of developments in less environmentally damaging and more advanced technologies than reactors? Are these other technologies important in other 'national interest' debates - such as environmental security? How will Australia 'secure' clean water supplies, stave off desertification or reduce greenhouse gas emissions? These are important issues, for security and national interest are no longer construed solely as the ability to defend Australia from attack by another country, but now encompass a broad range of issues.

NUCLEAR SAFETY INTERESTS

Radioactive Waste and Spent Nuclear Fuel

DFAT/ASO claim Australia needs a new reactor to take part in safety programmes on the nuclear facilities of other countries. There is an implication that through such work the IAEA recommendations on safety might be enforced. What DFAT/ASO have failed to explain is that IAEA safety standards are not enforceable and are not legally binding on member states. That is why the IAEA had no power to close the remaining reactors at Chernobyl after the accident in 1986, nor prevent major routine radioactive releases from reprocessing plants, nor stop a whole range of other environmentally hazardous nuclear operations. Whilst the IAEA may provide a forum for discussion amongst countries, and encourage debate on safety, it may not necessarily provide the *best* forum for issues relating to health and safety and nuclear power. Indeed, there have been many criticisms of the agency in this regard, in particular that the 'promotional' work of the IAEA often compromises this aspect of its remit.

The Senate Committee is, however, well aware of the environmental problems concerning the current reactor and isotope production facilities at Lucas Heights. There are no firm plans for decommissioning the reactor and associated plant; for the 'disposal' of the spent nuclear fuel and radioisotope production waste or the 'disposal' of the low-level and short-lived intermediate level wastes on site. All these matters should be resolved *before* the new reactor is given the go-ahead, especially as ANSTO's plans reveal that the new reactor and expanded radioisotope production will greatly increase the amount of radioactive waste produced at the site.

The central problem - that there is no environmentally acceptable way of disposing of nuclear waste - is not going to be resolved through ANSTO building a new reactor. Indeed, in relation to this, the arguments by DFAT/ASO that Australia needs a new reactor so that it can help other countries in the region with their nuclear waste programmes are somewhat laughable. As the Research Reactor Review noted in 1993 (p.107),

"A notable gap on the material put to the Review by Government agencies was any serious discussion of the problems of disposal of the ever growing quantities of high level radioactive wastes accumulating around the world and the part Australia might seek to play in these matters. The absence of input raised questions about Australian complacency in the face of one of the world's most intractable and dangerous problems."

"While work is continuing overseas into finding solutions to the problem of disposing of high level wastes, the Review considers that it is not sufficient for Australia to sit back and await the outcome, given that some progress needs to be made here on our own problems. Australia's influence would be vastly enhanced if it could take a leadership stance based on its own expertise and ability to solve the political problems associated with finding a national solution."

On this point the RRR may have been overly optimistic. In the five years since the Review sat, ANSTO's idea of 'leadership' has been to push for the establishment of a national nuclear dump (an unlined trench in the desert) for some types of waste, with a co-located store nearby for higher-level wastes and for the spent nuclear fuel to be shipped overseas (see below).

Cynics might argue that ANSTO could show 'leadership' by sending staff overseas to explain how they were part of the push to make a remote community take a nuclear waste dump - as is planned for South Australia. However, ANSTO could not claim to have overcome the political problems as submissions from two Aboriginal groups* - one from the region in question - plus opposition from a range of other groups, show that there are many hurdles to overcome to gain acceptance for the plan.

* Submission by Kevin Buzzacott, Aboriginal Elder and Spokesperson of the Arabunna People, to the National Radioactive Waste Repository Project, Phase Three, 28 April 1998. See also paper from the Kupa Piti Kungka Tjuta Aboriginal Corporation, 14 April 1998, to the Department of Primary Industry and Energy.

Alternately, ANSTO staff might be sent overseas to explain how they have attempted to cajole western nuclear weapons states (to whom Australia has supplied uranium) into taking the HIFAR spent nuclear fuel. As attempts have so far failed to find a place for the majority of fuel now left on site, should Australia continue to pursue this route? As the Research Reactor Review (p.212) noted it would be "morally dubious" to send the waste overseas.

The very serious side to this matter is that building another reactor and increasing isotope production will do nothing to solve any other country's nuclear waste problems and will only exacerbate Australia's radioactive waste problems. In fact, ANSTO's plans for its spent nuclear fuel stockpile only serve to create concern in the region.

Nuclear waste, shipments and the South Pacific Nations

The DFAT/ASO submission raised the concerns of the Pacific Island countries on nuclear issues, one in particular being "the safe transportation of nuclear material in accordance with international safety and security standards." Through agreements it has signed with Japan, to allow for reprocessing spent nuclear fuel containing AONM - which involved the return of high level waste and plutonium - Australia has countenanced the transit of radioactive waste to Japan through the waters of the South Pacific. Unlike some countries in South East Asia, such as Indonesia and Malaysia, Australia has never officially protested against these shipments - a further example of how Australia's domestic nuclear programme and the sale of Australian uranium leads this country to be compromised on nuclear matters.

Australia is also responsible for sending highly radioactive waste - in the form of spent nuclear fuel - through the South Pacific. Further, Australia has lobbied at South Pacific Forum meetings to prevent

a ban on the transport of nuclear waste. (Leaked memo from the Australian delegation to the South Pacific Forum, October 1993.)

In fact Australia has known for some time that if it had spent nuclear fuel reprocessed in the UK or France, that it would have to take back waste resulting from the reprocessing. Although Dounreay in Scotland is now closed as an option, ANSTO is chasing contracts with Sellafield in England or La Hague in France - which will result in waste being returned.

The waste which will be returned from France or the UK, *if* reprocessing does take place, will more than likely be high-level waste (this is stipulated for the current contracts for reprocessing in the UK and France). The waste which would have been returned from Dounreay, had the reprocessing contract gone ahead, would have been classed as long-lived intermediate level waste. The key point is that both high-level and long-lived intermediate level wastes have the same disposal route - that is they are meant to be disposed of in a deep-geological repository. Presently government agencies are not even considering a deep geological repository, thus ignoring an issue raised by the RRR, which stated that a repository should be found for high level wastes before a new reactor is built (Recommendation 17.4, p.216). ANSTO argue that they do not have to meet this recommendation as the waste that will be returned will be long-lived intermediate level waste. ANSTO knows that this waste has the same disposal route as high-level waste and is being singularly dishonest and attempting to skirt round this issue during the time of the EIS.

With regard to this above, it should also be noted that the reprocessing contracts also state that the waste returned will contain the same amount of radioactivity as that contained in the spent nuclear fuel sent for reprocessing, another 'matter' ANSTO is keeping quiet. Therefore the whole process of shipments, reprocessing, political manoeuvring and public manipulation does nothing to rid Australia of even one curie of radioactivity! However, by sending the spent fuel overseas ANSTO may put off the day of reckoning for a number of years (wastes have to be returned within at least 25 years of reprocessing). But, as the shipments of high-level waste from France to Japan and Germany have already shown, Australia *will* eventually be confronted with waste returns.

If ANSTO had made all efforts, here in Australia, to deal with the spent nuclear fuel it has produced then there might be some sympathy for its position. Everyone acknowledges there is no easy solution to this issue - but it could be made easier by stopping the production of waste through the closure of HIFAR and by not building a new reactor. As it is, we are left with the sad sight of ANSTO pleading with the UK and France to take the spent nuclear fuel - all in the hope that if ANSTO can move the spent nuclear fuel off-shore then one of the major hurdles in terms of public resistance will be removed. ANSTO will then be free to build a new reactor which will create even more spent nuclear fuel for which it has no solution. The public understands the stupidity and hypocrisy of these arguments and it is hardly surprising they are deeply cynical of ANSTO's motives.

The same cynicism also arises over the remarks by DFAT/ASO that "the expansion of nuclear power in the region is also generating increasing interest in the Australian community about the associated nuclear safety, waste, liability and nuclear transportation issues." (DFAT/ASO, Senate Submission, Vol.2, p.461.)

Much of the concern over nuclear power in the region is linked to the fact that Australia promotes

nuclear power in the region and that the government facilitates the sale of uranium to countries in the region. The concerns of the Australian public (erstwhile disregarded on many other issues) have not arisen from some sudden awareness of nuclear matters, but are inherently linked to a deep sense of unease about the role this country plays in promoting a technology which has been rejected here.

Nuclear Accidents

DFAT/ASO have also alluded to the novel argument that having a reactor is important so that Australia can feed into the safety regimes of other countries and thus (presumably) make some sort of representation to the country in question on reactor safety issues. As the DFAT/ASO submission notes: "one of the consequences of the Chernobyl incident (sic) in 1986 is that the argument that nuclear safety is the exclusive preserve of national authorities has lost any credibility it may once have had. The view has developed that the safety characteristics of a country's existing or planned nuclear power reactors are the legitimate subject of international interest and scrutiny." (DFAT/ASO, Senate Submission, Vol.2, p.460.)

Contrast the above - which implies Australia has every right to involve itself in overseas nuclear programmes - with an official statement on this matter in October 1993: "It is not appropriate to comment on Indonesia's policy concerning its fuel resources. Indonesia, which is facing diminishing oil reserves, has made decisions about the energy mix it needs to meet its future requirements on the basis of careful study. Australia respects Indonesia's sovereign right to make such decisions, just as we have the right to make similar decisions." (Letter from Caroline Millar, DFAT, to Perth resident, 12 October 1993.)

One month after the above was written, the Joint Standing Committee on Foreign Affairs, Defence and Trade noted in relation to the proposed nuclear power programme in Indonesia that, "the problem of finding enough energy for its future development is one Indonesia must solve. It is not appropriate for outsiders to dictate solutions." However, the Committee did go on to recommend that :

"the Australian Government take every opportunity to impress on the Indonesian Government the serious consequences a nuclear accident would have for the region, and for north and north western Australia in particular and: Any assistance and advice which can be provided in connection with Indonesia's nuclear plans is made available." ("Australia's relations with Indonesia", November 1993, p.189.)

The difference in policy reflects perhaps the less sheltered view of a parliamentary Committee which has listened to external concerns, a Committee made up of elected representatives whose accountability places more pressure on them to respond. This is why it is so important to have - at the very least - parliamentary discussion on all nuclear deals instead of allowing nuclear agreements decided behind closed doors. The above also serves, however, as an example of the near-schizophrenic attitude which governs so much of Australia's nuclear policy and is a clear reflection of the duality of the IAEA's own remit of promoting dual-use nuclear technology and then attempting to control it.

Other countries have, however, taken a different view on whether or not they can comment on the nuclear industries of neighbouring states. The UK has been castigated by Ireland and the Nordic countries over radioactive discharges from the giant Sellafield reprocessing plant. Austria had

heated rows with Germany over the proposal to site a reprocessing plant near the border at Wackersdorf in Bavaria (a project now abandoned). Similarly, Austria has lobbied the Czech Republic to close reactors which Vienna believes do not meet internationally accepted safety standards. Luxembourg has made representation to France over its reactors and so on. These protestor countries know that even if the risk of major accident is low, the consequences of an accident may be so massive as to make it imperative to avoid the risk altogether. With regard to this, consider some of the financial impacts of the Chernobyl disaster.

The destroyed reactor lost between 15-30% of its radioactive inventory, which spread across large areas of the Soviet Union and across almost the whole of Europe. The financial cost to the Soviet Union alone is estimated at US\$14 billion up to 1988.

However, a study two years later claimed the cost to be approximately US\$283-358 billion. ("Cost of Chernobyl Nuclear Disaster Soars in New Study", The Wall Street Journal, 29 March 1990.)

In 1986, the cost to the UK of fallout from Chernobyl (2,300 kilometres away) was put at US\$15-18million. (The Guardian, 27 August 1986.)

In 1996, Jakarta set the *limit* for compensation for damage resulting from an accident at one of its nuclear power plants at \$191 million. ("Jakarta sets nuclear accident compensation at 191 million dollars", Agence France Presse, 7 June 1996.)

An accident involving a major release of radioactivity from the (now deferred) Indonesian nuclear programme could cause widespread radioactive contamination leading to many thousands of cancers and other illnesses and would have resulted in major financial loss to Australia and the rest of the region. This is a national interest issue. Despite the differences in technology between the plants proposed for Indonesia and those used in Chernobyl, there is no guarantee of an accident-free nuclear power reactor (particularly one sited on a seismic fault line at the base of a dormant volcano, as was planned for Indonesia).

As has been noted "an accidental release from an Indonesian nuclear power plant represents an unprecedented threat to Australia's security and well being." (Barnett, J., 1996, Indonesian Nuclear Power and Natinal Security, Centre for Resource and Environmental Studies, Australian National University.)

This is a view ANSTO disagrees with. On 29 September, during the Federal election campaign, ANSTO filed a report on their website concerning a study of the possible impact that a nuclear accident in Indonesia might have on Australia. The report - not surprisingly - concludes that the impact, in terms of radiation dose to the public, would be very low.)

The Australian National University computer simulation of wind patterns showed that at certain times of the year prevailing winds sweep across Java and onto Australia. (Bita, N., "Nuclear accident threat to region", The Australian, 10 September 1996.)

In 1994 the shadow Minister for the Environment, Ms. Chris Gallus, called on the government to have an environmental impact assessment made of the Indonesian programme. ("Australia warned of Indonesian nuclear crisis", Reuters, 24 January 1994.)

Here then was a clear case of where the interests of the nuclear industry were at odds with the long term interests and security of the country. Australia did nothing to head off this threat. Indeed there was no effort made to give support for alternative, renewable energy systems in Indonesia. Jakarta has been left looking for a partner to develop solar power when Australia pulled out of a major project in 1996. (Dayton, L., and Williams, L., "Downer to face Jakarta fury over cancelled project", Sydney Morning Herald, 16 July 1998.)

However, the uranium industry, as is clearly demonstrated in the submissions from DFAT/ASO, enjoys continued support from the government. There is then a conflict between what is in the national interest - averting a potentially threatening nuclear programme in a neighbouring state through aiding alternative energy systems - and the nuclear industry's interest which is to encourage nuclear power and aid uranium sales.

If DFAT/ASO and other governments agencies were honest, encouraging Indonesia away from the nuclear option would also satisfy a security concern that has long been held in Australia circles - that is a nuclear-armed Indonesia. Whilst some agencies have down-played this (perhaps to help nuclear trade?*) other commentators have been more forthright in their assessment**.

* "Alarm at nuclear spread in the region", The Australian, 3 September 1990 - article on a report leaked from the Office of National Assessment.

** "Hayden urges nuclear catch-up", Weekend Australian, 30-31 March 1996.

Whatever the merits of the concerns, regional environmental and security interests are met by discouraging countries from embarking on nuclear programmes.

The implication from DFAT/ASO is, however, that by taking part in reactor programmes Australia can somehow prevent accidents. There is little or no diplomatic leverage through existing conventions to make this happen. Safety reports undertaken by the IAEA are the property of the country in question. Even if major safety problems arise, the IAEA has no powers to force a country into taking action to rectify them. Obviously diplomatic representation would be made, but such work is not in the technical or scientific realm. That is precisely why the Nuclear Section of DFAT has trained diplomats who work in this field. Does Australia need to spend money on training more nuclear scientists, or should it increase its diplomatic input to make sure existing treaties work effectively and are given extra powers? More importantly, should it not be spending its money on alternative energy and energy saving measures which not only negate the need for nuclear power but which also meet that other great threat to global health and security - the continued and expanded use of fossil fuels.

One final point on this. The IAEA's record on spending in the areas it covers, in particular on safeguards and safety should be investigated further. If, as DFAT/ASO claim in their Senate Submission, "the non-proliferation issues and the nuclear safeguards and safety issues are absolutely important to Australia's security", then the Senate should be supplied with figures on how much has been spent in these areas - by scientists, technicians, bureaucrats and diplomats - over the past ten years. This might help in determining if the aims of the appropriate agencies are being properly financed, or just being paid lip service.

Costings for activities which promote the use of nuclear technology should also be supplied. However, in some cases it might be difficult to determine exactly which category an item of expenditure might relate to. For example, a scientist claiming that all nuclear reactors can be made safe, or a technician claiming the problem of nuclear waste is 'solved' does much to add to the veneer that nuclear technology is manageable and therefore desirable. This then might be seen as part of the promotional work of the industry rather than the safeguards/safety effort.

NUCLEAR POWER IN THE REGION

Economic Interests

The spread of nuclear power in the Asia-Pacific region falls into two categories. Countries embarking on major nuclear programmes, or existing states expanding their research or power reactor. The majority of new power reactors in this region are in countries which already have substantial nuclear programmes. The following countries and the number of reactors being built (in brackets) are from ANSTO's internet site: China (3), India (4), South Korea (2), Pakistan (1). The new reactors planned by these countries do not add to proliferation concerns in the region - particularly as three of them are already nuclear weapons states.

Japan's nuclear agency has said it plans to build another 23 nuclear power plants. Given domestic opposition to these plants, plus the financial crisis the industry was already experiencing *before* the Asian currency crisis, it is highly unlikely this programme will eventuate. The nuclear programmes of other regional states are also either on hold or cancelled because of environmental concerns or financial problems. ("Tumbling markets dim prospect for nuclear in Southeast Asia", Nuclenics Week, 30 October 1997.)

None of the countries in the region are planning an increase in the number of research reactors. Indonesia planned a second reactor, one dedicated to medical isotope production. This proposal is now on hold because there is a glut in the isotope market which would not make such a project profitable. Other than Australia, only three other countries in the region have research reactors under construction, on order or planned as at 1994 - China, Japan and Thailand. None of these facilities represents an *additional* proliferation risk.

On the expansion of nuclear activities in the region, DFAT/ASO seem to want to have it both ways. They give the impression that nuclear power in the region is a risky business for which Australia needs a reactor in order to help supervise it. However, DFAT/ASO state that nuclear power in the region "will bring with it commercial benefits. Australia could share in these opportunities if we maintain and develop leading edge nuclear fuel cycle expertise." (DFAT/ASO, 1998, Senate Submission, Vol.2, p.461.)

As an example of the commercial opportunities presented by the nuclear industry in the region, DFAT/ASO commented on ANSTO winning a tender to build hot cells at the new facility being proposed in Thailand. But is that all DFAT/ASO means by grasping the opportunities presented by an expanding nuclear industry? As Australia has very little to offer in terms of modern, power reactor technology and nothing to offer in terms of waste management, what do DFAT/ASO really mean? Are they suggesting that Australia should also develop small-scale prototype enrichment

plants, or reprocessing plants in order to take part in an overseas market?

Or do DFAT/ASO mean that an expanding nuclear industry means more opportunity for uranium sales? Are we to assume from this that our diplomats and scientists are unpaid salesmen for private uranium companies? If so, it seems a grubby little add-on with no real benefit to Australia. If *all* the costs to the government of uranium mining are added together - including the percentage of the new reactor - it would be realised there is precious little (if any) financial gain to Australia from commercial involvement in the nuclear industry.

The supposed economic benefits from promoting the nuclear industry in this region, as a way of helping Australian uranium suppliers, should certainly be questioned. Building a new reactor as part of facilitating such trade would represent an unprecedented subsidy to an industry that does not fully cover its costs (payments made to the ASO from uranium companies do not cover the costs of the ASO's work). The AU\$300 million price tag for the proposed reactor does not include annual operating costs, decommissioning of both the present and proposed reactor, disposal of current and future radioactive waste and spent nuclear fuel, the decommissioning of associated wastes plants and so on. These will add substantially to the final amount. Moreover, is it fair that any area of Australia be asked to take the risk of having a new reactor and/or waste dump so that private companies and shareholders can benefit from the sale of uranium to an industry which has been rejected here?

There are many other arguments on the costs and benefits of the new reactor which are too complex to go into here. However, in national interest terms the focus should be on the most effective way to spend money to give the greatest return on non-proliferation and safeguards. This must be the most pressing question for the Senate Committee to answer and should override other considerations

RECOMMENDATIONS

1. That the Committee recall DFAT and ASO to discuss if there are more pressing areas of nuclear safeguards and safety work which need financing over that of the reactor.
2. That ASO, ANSTO and DFAT be asked to list the exact areas, if any, where a new reactor will aid the progression of safeguards in relation to the IAEA's Strengthened Safeguards System (Programme 93+2).
3. That the Committee take into account the comments made about ASO funding and general IAEA expenditure in the research paper, 'Nuclear Safeguards' which was written for the Senate Select Committee on Uranium Mining and Milling (available from the Parliamentary library).

Jean McSorley
October 1998.