Executive Summary

We are all subject to ionising radiation both from the earth and space and this natural (or background) ionising radiation can be harmful.

Similarly, artificial ionising radiation - the product of various operations of nuclear technology – can affect human health and the environment.

Natural radiation makes up approximately 80 percent and artificial radiation approximately 20 percent of the ionising radiation received.

The measurement of the impact of ionising radiation on living matter is the "dose" and its unit is the sievert. Doses levels are usually described in millisieverts (that is one thousandth of a sievert).

There is general agreement that high level doses (greater than about 500 millisievert) can have serious health consequences. However there is considerable controversy about the impact of ionising radiation at low levels (less than say 10 millisieverts).

Currently the internationally accepted dose standards from artificial radiation is 1 millisievert per annum for the general public and 20 millisieverts for workers in the industry.

Radioactive waste is the biggest problem facing the nuclear industry. Since the industry's inception, waste has continued to stockpile without satisfactory solutions being found.

Radioactive waste by its nature produces ionising radiation and is therefore a potential health problem. In order to ensure protection from it effects, a complex regulatory regime has evolved. An important feature of this regime is the classification of waste, into three categories:

- Low level (and short-lived intermediate) waste
- Long-lived intermediate level waste
- High level waste

Management of the waste varies according to the classification. Of significance here is that shielding or other protection for transport and storage methods will reflect the particular waste classification. The committee found that these classifications were not helpful for the general public in understanding the hazard levels involved. It recommended that an Australian classification system incorporate dose ranges so that the public has a much clearer idea of any potential hazard from the material.

Most of the waste in Australia is produced by ANSTO at Lucas Heights and this is where most of the waste is currently stored. A much smaller amount is stored in "dispersed" locations, such as hospitals, universities and industry.

ANSTO, in line with International Atomic Energy Commission definitions, does not regard spent fuel as waste. The NSW Department of Conservation and Environment, on technical grounds, regards the material as waste and in "everyday" terms this material can only be regarded as waste. ANSTO should acknowledge it as such. While this is a somewhat

semantic point – the important issue is that this highly hazardous material is managed with considerable care - ANSTO's determination to avoid the term "waste" can only continue the mistrust that exists between it and the public.

Radioactive waste is regulated by both state and federal governments and the committee was advised that there is uncertainty about the constitutional power relating to nuclear technology.

The Proposals

In order to manage the existing stockpile and future waste, the Federal Government is proposing to build two new radioactive waste storage facilities.

The **repository** in South Australia, near Woomera, will collect low level waste and short lived intermediate waste (half life less than 30 years) for 50 years. It will then be closed (subject to a review at that time) and the site will be "controlled" for a further 200 years by which time the waste will have decayed to background levels.

At the commencement of its operations, an initial transport campaign (to shift the backlog of existing waste) of over 170 trucks will move low level and short-lived intermediate level waste to the Repository. (The road option was identified by the EIS as the best). Most of this backlog (some 130 truck loads) is located in Sydney, at ANSTO, over 1,500 km from the repository. This initial transfer will be followed by intermittent smaller transport movements when enough waste has accumulated to justify the transportation, estimated to be four or five truck loads every two to five years.

The federal regulator, ARPANSA, is currently considering an application from the Department of Education Science and Training for a licence to operate the repository.

The **Store** will hold, on a temporary basis of 50 years, long-lived intermediate level waste until a permanent (deep geological) repository can be developed.

The site for the store has not been identified although the Federal Government has ruled out South Australia. The Federal Government is currently considering a short list of eight sites but will not make the list public.

It was suggested that New South Wales is a likely target with Jervis Bay being a particularly likely location.

As this proposal is not as well advanced as the repository, there are no formal transport plans to consider. However, the core issues would be similar to the repository proposals.

There has been considerable public concern raised about these Federal Government proposals both in New South Wales, particularly about the transport aspects, and other states. South Australia and Western Australia have passed, or are passing, legislation opposing the siting of waste facilities in their states.

The New South Wales Government should clearly indicate its opposition to the siting of any new storage facility in New South Wales by amending the Uranium Mining and Nuclear Facilities (Prohibition) Act accordingly. This would be a clear statement of principle in line with action taken by Western Australia and South Australia on behalf of their residents.

Public Consultation

The most dominant theme before the Committee, both in submissions and evidence, was the failure to consult and provide information about the proposals. Not all the complaints rejected the proposal outright but wanted to be effectively consulted and reliably informed. Local councils and their peak organisations were particularly disturbed by this lack of consultation.

The social and psychological aspects of nuclear energy and radioactive waste make it a unique issue for many people. Governments and the nuclear industry overseas are beginning to realise this and develop consultation process commensurate with the community concern. (The IAEA says that "gaining the trust of the public appears to be a very important element in successfully progressing in the repository siting process").

Finland and Sweden are two countries that have achieved site selection on the basis of community consent, through a process of public participation and involvement going-well beyond the traditional report and respond approach.

This realisation has not trickled through to Australia.

Consultation is much more than seeking submissions to an EIS on a site already selected or holding a single meeting in a town along a transport route. A good example of the failure of the Federal Government to follow a consultative, transparent approach is the current site selection process for the Store. It refuses to make public the final short list of sites. This secretive approach is but a continuation of the discredited, antagonistic policy of Decide Announce and Defend, where sites appear to the public to be plucked out of the air and imposed on communities.

The Committee is of the view that the storage and transport of radioactive material is so problematic with the general public that it requires sophisticated consultation processes. These have been lacking to date.

The Need for the New Waste Facilities

ANSTO's operations at Lucas Heights are the largest generators of radioactive waste in Australia, producing almost 90 per cent of the radioactive waste. It will be the main contributor of waste to these two new waste facilities.

The rationale for the two depositories is to strengthen radioactive waste management in Australia by rationalising and centralising the unsafe dispersed (non-ANSTO) storage locations across the country (estimated to be in excess of 100) and providing safe containment until the material decays to background levels. Two national sites are preferred on the grounds that the small volumes generated in Australia do not justify separate state facilities.

However, under these proposals, both Lucas Heights and the operational non-ANSTO ("unsafe") sites will continue to be waste facilities as they accumulate waste on a two to five year cycle. This neither reduces nor rationalises the number of operating waste facilities. Rather the proposals actually increase the number of operating facilities by two – the Store and the Repository. This rationalisation is then a curious argument.

It is hard to see how the proposal to move waste to remote areas away from the point of production will increase safety as the transportation of the material actually increases the risk from accident or intervention.

According to the Federal Government, the small volumes generated do not justify separate state facilities but neither can they justify creating two new facilities for ANSTO's waste, at least one of which is in a very remote location.

ANSTO has repeatedly assured the Committee that the storage of the material at Lucas Heights is safe (indeed international best practice) and the Government's own radiation protection regulator has advised that there is capacity to store existing and future waste there (a point confirmed by ANSTO).

The Australian community benefits from the products produced by ANSTO's reactor. But it is hard to see how this justifies imposing the facilities on unwilling communities chosen virtually at random. Furthermore, it is arguable that alternative technologies and strategies can produce these radioisotopes.

The Committee, therefore, cannot support these storage proposals. For the time being, Lucas Heights should continue to be the major national waste facility until a more acceptable resolution of the waste problem is developed.

In this interim it is essential to ensure that the waste facilities at Lucas Heights operate to the highest standards to guarantee the health and safety of the community. But it is just as vital that Lucas Heights does not become a de facto or permanent facility for the storage of nuclear waste.

The Federal Government should as a matter of urgency recommence the site selection process for a waste facility in a genuinely consultative way, in line with more contemporary and democratic approaches being utilised overseas (and outlined in this report) that are based on community acceptance criteria.

The committee does agree with the Federal Government and the NSW EPA that an audit of the dispersed facilities needs to be carried out. The committee believes this should be carried out urgently and upgrading carried out where required.

New Reactor

A new reactor and associated operations will continue to generate radioactive wastes at all levels, exacerbating the existing waste problem.

The committee heard very credible evidence, some from medical professionals, that Australia no longer needs a reactor and that the best way to deal with future waste is by not producing it.

It was argued that NSW (and Australia) could provide all its radionuclides by a combination of importing nuclear-sourced radioisotopes and producing non-reactor radioisotopes from alternative sources here in Australia.

ANSTO and others argued that there were many uses, other than medical, for the radioisotopes and that alternative technologies could not realistically replace the reactor.

There are, however, countries without reactors that are able to utilise nuclear technology to provide a range of community needs to a high standard.

The option of sourcing radioisotopes from overseas offers some advantage in that the material is being sourced from existing operations, such as Canada. Utilising these existing export markets will reduce duplication in reactor operations and could well provide some economic advantage. The disadvantage of this approach – that it will also contribute to the production of radioactive waste at the point of production - needs to be acknowledged, however.

This option and the current changeover from HIFAR to the RRR (for which an operating licence has not yet been issued) provides the opportunity to take a renewed look at the potential for alternative technologies. Such technologies have the potential to be a lucrative business opportunity, possibly for NSW.

The McKinnon Report concluded that, in 1993, the "jury was still out" on non-reactor sources for radioisotopes and that a better informed and supported decision would only be possible in the future.

Clearly, the benefits of the reactor decrease and the disadvantages increase as more alternatives become available. The evidence on this issue was so compelling that it justifies further investigation and careful consideration.

The Committee recommends that, in conjunction with a new site selection process, the Federal Government should investigate the viability and practicality of alternative technologies for radioisotope production in Australia.

During this time, the operating licence for the Replacement Research Reactor should be deferred and the Federal Government inquire into the need for and possible uses of the RRR. The HIFAR would continue to operate in its place.

Transport

There is no doubt that the transportation of radioactive waste increases the risk of accident or incident (including some form of terrorist intervention).

By continuing the storage of waste at Lucas Heights on an interim basis, there is no need to transport most of the waste and any risks associated with that transport are avoided.

However, should the transport proposals proceed (due to the Federal Government rejecting the committee's findings), the transport implications of the proposals will need to be addressed. Local councils and their representative organisations (the Local Government and the Shires Associations) provided considerable material to the committee regarding the possible impacts of the Federal Government's transport plans along the proposed routes.

The management of the transport of radioactive waste is regulated by legislation and various Codes. This regulatory regime aims to package, shield and transport the waste under the appropriate conditions for the activity and hazard to ensure safety.

There is clearly a need for ANSTO and ARPANSA to provide the public with better information on the activity of the waste to be transported. ANSTO's database of its low level radioactive waste should be used to provide the effective dose rates (in sieverts/hour) for the waste and its packaging for public information. This would be of much more use to the public than the current waste definitions.

The inventory of waste proposed for transport to the Repository includes some long-lived intermediate level waste. This does not appear to comply with the definition of the repository for low level and shorted lived (30 year half life) intermediate waste. ARPANSA, in finalising the waste acceptance criteria, should ensure that no long-lived intermediate level waste is accepted in the Repository.

Proponents of the proposals claimed that the radioactive waste was not as dangerous as other hazards, such as petrol. The committee rejects these arguments. The community accepts these goods and associated risk because of a justifiable, demonstrable benefit. Generally this is not the case with radioactive waste.

In addition to general uncertainty mentioned above, there were specific concerns about the risk of accident and the consequences of such an accident. Much of this centred around the choice of road over rail as the transport mode.

The increased risk of a road accident would endanger public health through a spill or even a release of radioactive material, it was argued. In particular the route over the Blue Mountains was identified as a "black spot" for truck accidents.

Another consequence of a road accident was the implication for local economies such as the effects on tourism (the Blue Mountains is a World Heritage Area) and on "clean and green" agricultural products. Even if there were no spill or release in an accident, the concern the general public has regarding nuclear matters could have adverse economic impacts.

The proponents of the proposals claimed the risk of accident was small but, even in the event of an accident, the conditioning and packaging would ensure the material did not escape. In the unlikely event that the packaging was breached, the nature of the material meant that with appropriate instruments the waste could be simply located and retrieved.

The Fire Brigade Union contradicted this view stating that everything burns under the right conditions and that an accident, particularly with a fuel tanker, could generate enough heat to burn concrete and steel containers and vaporise the waste. This would transform the waste into a form in which it presents the greatest risk to human health.

This scenario in the committee's view, is unlikely, although the consequences of such an event would be extreme. On the evidence available to it, the committee agrees with the views of both the Environment Protection Agency and State Emergency Management Committee/Fire Brigade that the transport proposals for low level waste can be safely managed.

However, both the EPA and SEMC have indicated that these proposals need further risk assessment. The Committee supports this, stressing again, however, that no matter how low the risk, these transport proposals represent an unnecessary risk.

The assessment should be carried out, in consultation with the Commonwealth, by state agencies including Police, NSW Fire Brigades, NSW Health, and the Department of Environment and Conservation and should include consideration of the risk of potential terrorist activities.

As most of the burden of costs are likely to be emergency services related, all of which are state functions, there are potentially significant cost implications for New South Wales in the proposals. New South Wales agencies, again in consultation with the Commonwealth, should detail and cost the emergency services requirements to best manage the transport proposals.

It is important that local government peak representative bodies and any directly affected local council be consulted in both these processes.

This agreement should be based on the principle that the Federal Government bears the full costs incurred by the community (including local councils) of any transport and storage proposals.

The committee supports the recommendation of the EPA that there should be a formal agreement between the State and the Commonwealth to cover these transport proposals.

Regardless of the transport proposal adopted, it should be the subject of independent review (by the IAEA's Transport Safety Appraisal Service), as recommended by the Environment Protection Agency.

The committee was told that insurance was not available for the transport of radioactive waste. It is unreasonable for individuals to carry any such costs or be forced to the courts for compensation. The Federal Government should indemnify the community against accidents with radioactive waste.

The new reactor as with HIFAR will continue to produce the most radioactive of materials – spent fuel. This material is enormously more radioactive than other waste material and is stored on the reactor site for some years until it cools and initially decays. Currently the spent fuel is sent overseas to be reprocessed after which the reprocessed intermediate level waste is returned. This material is earmarked for the Store.

Doubts were expressed about the long terms viability of these overseas reprocessing options. Should the options disappear, Australia will have to manage its own spent fuel stock. One option is to place it temporarily in the Store awaiting new reprocessing arrangements. Under this proposal this high level waste would be transported twice, to the Store and back. In addition to the community concerns that are likely to be generated, the increased worry about terrorist intervention make this proposal very unsatisfactory. Should these circumstances ever arise it would be much more acceptable to keep the material at Lucas Heights and avoid unnecessary travel and handling.