



COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

JOINT COMMITTEE ON PUBLIC WORKS

**Reference: Replacement nuclear research reactor, Lucas Heights,
Sydney**

THURSDAY, 6 MAY 1999

SYDNEY

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JOINT COMMITTEE ON PUBLIC WORKS

Thursday, 6 May 1999

Members: Mrs Moylan (*Chair*), Mrs Crosio (*Vice-Chair*), Senators Calvert, Ferguson and Murphy and Mr Forrest, Mr Hollis, Mr Lindsay and Mr Ripoll

Senators and members in attendance: Senator Calvert, Mrs Crosio, Mr Forrest, Mr Hollis, Mr Lindsay, Mrs Moylan and Mr Ripoll

Terms of reference for the inquiry:

Replacement nuclear research reactor, Lucas Heights, Sydney

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Committee met at 9.00 a.m.

HALLAM, Mr John Richard, Nuclear Campaigner, Friends of the Earth

CHAIR—I declare open this public hearing of the Joint Committee on Public Works. I welcome the representative from the Friends of the Earth Sydney. The committee has received a submission from Friends of the Earth Sydney dated 31 March 1999. Do you wish to propose any amendment?

Mr Hallam—No, but what I would like to do is read and comment on a letter which was written yesterday to Senator Minchin. That letter summarises in many ways the case which I will be making. Then I suggest we go into questions based on that.

CHAIR—Yes, you can read that in now.

Mr Hallam—The letter states:

Dear Senator Minchin,

I am writing to you with respect to your approval on Monday of the Lucas Heights New Reactor proposal.

There are a number of substantial reasons why this proposal is completely premature.

1)The Draft and Supplementary Environmental Impact Statements are completely defective in that they do not contain a proper description of the proposed new reactor, but only operational parameters of a relatively non-detailed nature.

This violates both the guidelines of the EIS—

that is, the original guidelines which were arrived at by process of public comment—

in which it is stated that a detailed description is required, and the administrative procedures to the EPIP legislation, under which the process takes place.

Again, you will see more detailed amplification of that in the submission. It goes on:

It also makes meaningful assessment of the operational capabilities of the proposed reactor, the cost of the proposed reactor, and the safety of the proposed reactor impossible.

Safety assessment particularly, of nuclear reactors, requires detailed engineering data on the plant as it is to be built. Conceptual or 'bounding' studies such as ANSTO proposes are completely useless.

It is also not possible for adequate assessment to be made of project costs without precise knowledge of what is actually to be built.

Again, this can be quite a crucial matter. I have commented in detail on other nuclear reactors, including much larger ones. I have done safety work on VVER 1000 reactors in Eastern Europe. Even two nearly identical reactors of the same design type can experience completely different—

CHAIR—Mr Hallam, can we get you to complete the reading of the letter and then in your opening statement you might like to elaborate on this.

Mr Hallam—Fine. It goes on:

Finally, the usefulness of the proposed reactor to the scientific community depends critically on exactly what its capabilities will be.

From the information in the draft EIS and supplement, we know only that the proposed new reactor may or may not have either two or four beamlines, and that it may or may not have a 'hot source'.

We are reasonably sure that it will have a 'cold source'.

With information this sketchy it is not possible for either Environment Australia or yourself or the PPWC when it meets in the coming weeks, to determine whether or not the proposed reactor will be able to offer better capabilities than a spallation source.

In other words, the information on the project offered thus far by ANSTO does not permit us to determine either whether or not the project will be safe, nor how much it will cost nor whether it will be at all useful to the scientific community.

2)Your—

that is Senator Minchin's—

approval of this project pre-empts the deliberations of both the Senate Economics References Committee and the Parliamentary Public Works Committee.

I therefore request that you revoke your approval until such time as a proper evaluation has taken place of all project details.

FOE is confident that such an evaluation, conducted in an objective manner, will find as did the Research Reactor Review, that this project is ill-advised and should not proceed.

CHAIR—It is proposed that the submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have any objections? There being no objection, it is so ordered.

The documents read as follows—

CHAIR—I now invite you to make a short statement in support of your submission before we proceed to questions.

Mr Hallam—I have looked at the ANSTO response and basically it does not answer the concerns which we have raised. The ANSTO response essentially refers us to the supplement to the draft environmental impact statement. The supplement to the draft environmental impact statement simply repeats what is in the draft environmental impact statement.

The supplement says, as does the original draft, that ANSTO is using a conceptual or bounding approach. It says that there are four possible contracts, which it does not detail, although those possible contract candidates were detailed back in 1993 in a supplement to a submission to the research reactor review. Incidentally, that review is far more technically detailed than what is in the draft environmental impact statement or its supplements.

The supplement simply repeats what is in the draft. It does not meet our criticisms. It does not state how it is possible to give an accurate costing of the reactor without knowing what is being built. It does not state how it is possible to know what the capabilities of the reactor will be without knowing what has been built. It does not refute either our criticism or the criticism of the peer review that it is not possible to conduct a proper safety review of the reactor without knowing what is being built.

When you look at the draft environmental impact statement, you find that certain parameters are spelt out. The reactor is to have a power which will give it 3×10^{14} neutrons/cm²/sec. It is to have tangential beams. It is to have a cold source. It may or may not have a hot source. After that, things get very murky.

It is not clear either from the diagrams in the draft environmental impact statement or from the text whether the reactor will simply have one cold source or more than one cold source. It is not clear precisely how many beam lines there will be. There will be at least two beam lines; there may be four beam lines; there may or may not be a second beam hall. It is clear that ANSTO is quite deliberately and consciously leaving these options open. For example, a second beam hall is shown dotted, and the hot source is shown with a question mark after it.

This, in turn, has critical implications for the value of the reactor to the research community. If the reactor is to be a world-class instrument, it will have to have instrumentation which is as good as or significantly better than instrumentation which is installed on other reactors worldwide. One of the claims made in our submission is that in fact it will not be a world-class instrument and you will be paying some \$300 million in order to be somewhere No. 10 and No. 13 on the world's Neutron Scattering League.

In its supplement, ANSTO produces a table in which it compares the proposed reactor with three other existing reactors. I think one of them is Orphee, another is NIST and I believe the next one is HFIR, but my memory may not serve me correctly there. The table shows that the proposed ANSTO instrument will have instrumentation and capabilities which are inferior to all three of these reactors. These reactors which ANSTO has compared it with are middle-of-the-line reactors. They are medium power, medium capability reactors; they are not top-of-the-line nuclear reactors.

We are looking at a proposal which, at best, will place us somewhere at the bottom of the top 10 or possibly off the bottom of the top 10 of the world's Neutron Scattering League. We will be probably be around No. 11, No. 12 or No. 13 in the world's Neutron Scattering League. We are looking at paying \$250 million to \$300 million for that. We cannot know exactly what those costs are going to be. We cannot know exactly what our instrumentation is going to be without much more detailed, complete and final plans from ANSTO.

Finally—and this is almost a legal point—both the guidelines to the draft environmental impact statement and the text and the administrative procedures of the act itself demand that a detailed project proposal be submitted. ANSTO has not submitted a detailed project proposal, and ANSTO does not even pretend to have submitted a detailed project proposal. What it has submitted is a statement that this is the sort of thing we would like to have with the sorts of capabilities that we would like to have.

I submit that the environmental review process cannot legitimately proceed on such a basis—it cannot proceed until we have a definite proposal—and that unless the proposal has moved down the track to the point where we can say that we know within a reasonable degree of certainty what is going to be built then the entire process of environmental review should not be taking place. And, of course, all contracts and all tenders which are let must be let subject to the correct hoops being gone through in the environmental review process, which it must be understood is an iterative process.

CHAIR—Thank you, Mr Hallam. Any questions from the committee?

Senator CALVERT—I will throw one in to start. Mr Hallam, are you aware of Professor John White, who is, I think, secretary to the Australian Academy of Science?

Mr Hallam—I do not know what he has said, so enlighten me.

Senator CALVERT—No, I am asking whether you are aware of him. Do you know who he is?

Mr Hallam—Yes.

Senator CALVERT—I believe he was in charge of the Grenoble research reactor in France, which is recognised as probably one of the best in the world. He told us in sworn evidence yesterday that this proposed facility would be second only to that in the world and that it would be superior to even reactors in Japan, for instance. Would you care to comment on that?

Mr Hallam—When you look at what is proposed, it is very hard to see how he can make that statement. When you look at the power of the reactor and the proposed instrumentation, even the three reactors with which ANSTO compares its proposed reactor are all superior in capability to the proposed reactor. Also given the vast degree of uncertainty in what is actually going to be built, unless he can show us what is actually going to be built, it is hard to know how he can make any statement about how it compares with any other reactor.

Senator CALVERT—You are saying then that ANSTO should have a design drawn up of what they want, how it is going to perform, plans and all the shooting match, and then get tenders from whomever to build it, whereas ANSTO I believe have said, ‘This is what we want. We are aware that there is different technology around the world, show us what you can do.’

Mr Hallam—That is undoubtedly the approach that ANSTO has taken. I would agree that there should be a design—if not a totally finalised design then at least a design which is sufficiently detailed for the informed public and for committees like this to comment on it. The whole process of environmental review involves submitting a finished or semi-finished proposal, and then modifying that proposal in the light of public comment—otherwise why bother?

Senator CALVERT—ANSTO have told us that they want to get best technology available and, rather than have a situation where they have four people who are just tendering on a design and therefore they may cut corners to cut costs to get the job, to design something that is appropriate for their needs. We were also told yesterday by ARPANSA—in answer to a question from my colleague Mrs Crosio—that once tenders are let and the proposal is under way it has to go through the review process where there will be public consultation and opportunities for the public to be involved. Is that not a good way to go? It is not as if it is going to be shut off from public scrutiny.

Mr Hallam—It still really cuts off the intent of environmental review legislation. If you are going to take environmental review legislation seriously, then perhaps what ANSTO should have done is said, ‘Look, here are four proposals which are all reasonably detailed,’ and invited public comment on those four proposals. I suppose I am speculating but, if I wanted to minimise the opportunity for real public input into the process, this is precisely what I would do. I would show the public as little as possible. And that is what ANSTO has done.

Senator CALVERT—I am not trying to put ANSTO’s case, but the way it was explained to us is that they will have a two-envelope system and one will be separate from the other. So the companies that are going to put in tenders will have one envelope with the proposal, the designs and the whole shooting match in it and the other one will have the cost. The cost ones will be kept separate until after ANSTO has assessed the four or five proposals of what they want. Once they have what they want, then they will look at the prices. Is that not the best way to get a superior reactor rather than try to build it to a price?

Mr Hallam—The impression I get from reading the draft EIS, the supplement to the draft EIS and ANSTO’s responses is rather that they have set bounding conditions including price and, therefore, what you will really be doing is building it to a price. Presumably, cost and capability and value to the research community as well as safety, waste disposal and those sorts of things are matters which this committee will want to look at. ANSTO just has not given you the kind of information that you need in order to be able to do that.

Mr LINDSAY—Mr Hallam, in your evidence this morning, you have placed great store and time on a summary which says the EIS cannot proceed unless we have a detailed proposal. Is that your position?

Mr Hallam—That is the way that EISs normally function. So I am not asking for something unusual; I am asking for the EIS process to operate in what is the normal way.

Mr LINDSAY—I am a non-technical person in nuclear science but, from what I have seen already and from the evidence that has been presented to the committee, a research reactor is a relatively simple device. Can you say why you really do need to know whether the thing is going to have two beams or four beams or whether the engineering of this reactor compared with the engineering of that reactor is different and how that affects the EIS? The thing is just contained in a small building; how is it going to affect the final outcome of the EIS?

Mr Hallam—It is not such a simple device as even, for example, a mining project. It does have safety considerations, and it is a considerably more high-tech thing than that. In terms of its value to the research community, which is the whole justification for building this thing in the first place, you are supposed to be supplying this wonderful service of producing neutrons which the research community is then supposed to be able to take away, and it is supposed to somehow revolutionise Australian science—at least, that is the impression we get. If that is what is supposed to happen, then it is the business of this committee to know that the capabilities you will be getting for your \$200 million to \$300 million will place you up there amongst the top 10 in the world. Without looking at exactly what sort of instrumentation that reactor will have and exactly what its capabilities will be, you cannot judge that.

Mr LINDSAY—But that has no impact on the environment.

Mr Hallam—It has an impact on whether or not you ought to build the thing in the first place.

Mr LINDSAY—Yes, I agree.

Mr Hallam—Isn't that what we are talking about?

Mr LINDSAY—No. Your evidence was that the EIS cannot proceed unless we have a detailed proposal.

Mr Hallam—The whole purpose of an EIS procedure, apart from looking at environmental impact statements, the very core in fact of the act, requires, first of all, that the project be justified. It requires an examination of whether it is in the national interest for the project to proceed. You cannot know that without knowing what the value of the project will be to the research community, without knowing how much it will cost and without knowing whether it will be safe. You cannot know any of those things without detailed design information.

Mr LINDSAY—In relation to your suggestion that the proposed new reactor will be able to offer better capabilities than a spallation source, the evidence before the committee concerning cyclotrons and spallation sources says very specifically that the range of isotopes that can be produced from a reactor cannot be produced from a spallation source or a cyclotron on its own. Do you agree with that?

Mr Hallam—Instant technetium 99M, which is the single, most used medical radioisotope, can be produced on the cyclotron, and that is well known.

Mr LINDSAY—Yes. But their evidence is the range—and all sorts of other things.

Mr Hallam—That accounts for some 90 per cent of nuclear medicine procedures. There is a lot of evidence, which other people will be talking about far more competently than I, that spallation sources, which are not the same as cyclotrons, can produce the full range of isotopes produced on a reactor. In addition, there is certainly a body of opinion, which you will see quoted in my submission on the EIS, which would prefer a spallation source to a reactor. So you have people saying, ‘Reactors are yesterday’s technology. What Australia needs is not a reactor but a spallation source so that we can do real neutron science.’ These are people who know a million times more about it than I do, and I would defer to them.

Mr LINDSAY—You said in your letter to Senator Minchin, ‘Your approval of this project pre-empts the deliberations of a couple of committees,’ including this one. That is not my understanding of the position of the operations of the PWC, and I can assure you that—

Mr HOLLIS—That was certainly how it read in two reports of the *Daily Telegraph* in Sydney. It read that way, and whether that was right or not—

Mr LINDSAY—It did read that way, but it left some information out.

CHAIR—That was not the minister’s original press release. The press obviously decided to—

Mr HOLLIS—No, but that was what the press published.

CHAIR—That is correct, but it was not for lack of trying by the minister to make sure that people understood that the project had to go before the Public Works Committee.

Mr LINDSAY—It is subject to the agreement of this committee.

Mr Hallam—I am certainly relieved to hear that it is subject to the deliberations of this committee. I would just like to take you back to spallation sources. I have a quote in my submission from ANSTO’s former Chief Scientist, Professor Barry Allen. He wrote in *Search* in October 1997:

The reactor will be a step into the past . . . apart from the neutron scattering element of the reactor, there will be little research and development, yet it will make a large dent in the budget for Australian research, which at this point is so badly needed in order to take us into the next century. The decision to proceed with a new reactor is not wrong, but it is a far cry from the optimal expenditure of funds that Australia badly needs in science and technology.

There is a series of similar quotes in that submission. I assume that Barry Allen would know a great deal more about it than I would.

Senator CALVERT—We also had evidence yesterday from a former employee there, a Mr Parsons. He was a member of the leading reactor group and a plant subsection reactor manager. His evidence supported the replacement reactor and the techniques that were to be

involved. What I am saying is that, for whatever reason, you will get different opinions from different people.

Mr Hallam—Allen is a former head of research at ANSTO. Again, at page 18 of my submission, I have a further quote from him. He said:

A spallation source, while also quite expensive, can provide many more research possibilities and take Australia into the 21st century, while a reactor will keep us back in the 20th century. In this regard, a spallation source such as I am currently using at CERN Geneva, allows the production of many exotic nuclides which can be used for the development of new cancer therapies and diagnostic techniques.

So you are getting people who are very senior in the research community saying that a reactor is simply not the way to go at all. Without a proper handle on what the capabilities of this beast are really going to be and how much it is going to cost, we cannot possibly make an intelligent evaluation of whether we should be spending our \$300 million on a new reactor or on a spallation source. If indeed the reactor specifications, capabilities and costs are in separate envelopes, as you say, then we also do not have a handle on how much this thing is actually going to cost the taxpayer.

Senator CALVERT—I have a fair idea because a similar one has just been completed in Egypt, and I think that is what they are basing their rough estimates on.

Mr FORREST—Putting aside the question of the environmental impact statement for a moment—that seems to be the focus of what you have said this morning—I felt your submission was asking deeper seated questions than that as to the real justification, so I would like to go back to that. Senator Calvert has already asked you questions about the body of opinion that is out there, and one thing I have learnt is that there is always a body of opinion amongst scientists as well, depending on their own particular barrow.

You made reference in the submission to Mr Fredsall's comment about cyclotrons. Mr Fredsall and Mr Parsons made a joint submission. Mr Fredsall was not able to attend yesterday for health reasons, I think, but I asked Mr Parsons that very question, and he gave evidence that cyclotrons, in particular, could not supply the appropriate neutron sources to achieve the scientific basis required here, so we will always have a difference of opinion.

Mr Hallam—No. Cyclotrons do not supply neutrons—that is perfectly correct. A spallation source supplies neutrons. You have two totally different—

Mr FORREST—He does not share your view that there are alternative sources.

Mr Hallam—In saying that a cyclotron will not give you a supply of neutrons, he is quite right. It is a different kind of animal. A cyclotron zaps a piece of material with charged particles, which are usually either positrons or electrons. A spallation source creates neutrons. It is a much larger and more complicated thing.

Mr FORREST—But, in terms of a reactor or these other alternatives, he did not share the confidence you have just given us. I am not sure whether he is speaking on behalf of Mr Fredsall, but I asked the question for that very reason.

Mr Hallam—What question did you ask him?

Mr FORREST—Whether there was an alternative to the replacement reactor.

Mr Hallam—If you asked him about cyclotrons, he would quite correctly tell you that a cyclotron does not provide neutrons which the research community can use. It does not; a spallation source does.

Mr FORREST—In the view of your organisation, if we do not want a reactor, we have to have both spallation devices and—

Mr Hallam—No. I would not view neutron science as being so important that we need to spend this kind of money on it in the first place. This is a question which we have not even opened, and which you would need to open with a lot more people in the research community. I do not think that neutron science is of such central importance to our R&D that we should be spending \$300 million on it rather than giving that same money directly to other projects in the R&D community. I would personally opt for neither a reactor nor a spallation source. I would fill my medical isotope requirement—the requirement for technetium 99M—using a cyclotron in Sydney and a cyclotron in Melbourne, and I would leave it at that. I would prefer neither a reactor nor a spallation source. However, if neutron science is so crucially important as ANSTO says it is, then I would suggest that a neutron science requirement for neutrons would be perhaps better filled by a spallation source than by a reactor.

Mr FORREST—If it is possible for us to somehow have a more satisfactory public consultation phase after we know the particular details of the reactor, your position would probably not change?

Mr Hallam—No, it would not.

Mr RIPOLL—You have partly answered my question, which was to do with medical isotopes. When we had a look at the facility, we were shown some medical work and the collection of the isotopes, in particular the half-life of this material—and there are some very critical half-lives. How else would we get the quality that we need to obtain for medical purposes if we did not have a nuclear reactor?

Mr Hallam—As I said, the single most critical isotope is technetium 99M, and that can be made on a cyclotron. About half the medical radioisotopes are already made on the cyclotron anyway, but the single most critical one will be able to be made on a cyclotron in Sydney and a cyclotron in Melbourne and will be roughly 50 per cent larger than the one you have.

Mr RIPOLL—Is it the same quality? Is it exactly the same product?

Mr Hallam—It is exactly the same product. You will have to go through all of this again with Jim Green anyway, but the only difference is that what the reactor produces is molybdenum 99. That decays to form technetium 99M. What the cyclotron produces is

instant technetium 99M. That means that it will have a somewhat shorter half-life than the non-instant molybdenum 99; but, as I said, you had better go into it with Jim.

Mr RIPOLL—Just to clarify: if you separate the things we can get by other sources, what is left that we can only get from the type of reactor that needs to be made in Australia?

Mr Hallam—Jim is better qualified to answer this than I, but relatively little.

CHAIR—Mr Hallam, you quite rightly have been watching the EIS process very closely in relation to the proposal for a replacement reactor. I notice that in ANSTO's responses to issues that have been raised in relation to the EIS process—which they said was a comprehensive analysis of environment impacts which extended 12 weeks beyond the required period for public consultation—they said:

At the end of the process, environmental approval was recommended by the minister, subject to twenty-nine conditions. These conditions included the need for ongoing publicly available reporting against commitments and implementation of an independently certified Environmental Management System to ISO 14000 series standard.

Were you aware that additional conditions were imposed which are to be met as the process proceeds? I understand that, because ANSTO has not laid down precise details of the replacement reactor, you have an ongoing concern about the continuing EIS process in relation to that.

Mr Hallam—Obviously I would have a broader concern about the EIS process not only in respect of this project but in respect of other projects. I have involved myself in the EIS process over the years, and I have seen how it has evolved. Unfortunately, much of that evolution has been in a negative direction away from the original intent of the EIS process. What is often forgotten is that the EIS process is not simply about planting a few trees here and there and the colour of the site fence. The EIS process is first and foremost a process of public consultation whereby we decide whether or not it is in the national interest to have a project in the first place, based upon a whole range of considerations and not simply local site-specific green type environmental considerations, which the whole EIS legislation is set up to review and, secondarily, to decide whether or not we are going to fix silencers to the construction machinery when we build the reactor which is what appears to be the bulk of the draft EIS.

CHAIR—Are you saying that in your opinion, despite that lengthy process and the extension of that process to an additional 12-week period for public review, it is still not satisfactory?

Mr Hallam—Yes, because the core of the process—the reason why we do this process in the first place—has been lost. We have endless disquisitions in the draft environmental impact statement about matters that are of secondary interest and very shallow treatment of matters that are of primary interest. Matters that are of primary interest are the matters that govern whether or not we ought to be even thinking about this project and then, after that, what the project will look like in detail if we did really think about it.

We cannot make informed judgments about whether or not we could proceed with the project until we do know what the project would look like with a fair degree of detail. Then

we can look at it and say, 'No, there is no way we should proceed with that,' or we can say, 'X, Y and Z needs to be changed.' That is the whole essence of the environmental review process. Instead, what we are seeing are endless disquisitions about the colour of the site fence, whether there may or may not be a couple of Aboriginal sites on the site—most likely, there are not—bushfire protection and all kinds of stuff. That has its place, but it should not dominate the process, and it does.

Mr RIPOLL—If the project were to go ahead, what would your organisation be happy with in terms of a type of reactor, project and so forth?

Mr Hallam—That is a bit like asking me whether I would prefer to be gassed or electrocuted.

Mr RIPOLL—Maybe in a way that is the question. Given that the project may or may not go ahead—let us say it does—what would you prefer?

Mr Hallam—Obviously, my focus in this presentation has been very, very narrow, but Friends of the Earth as a body is totally opposed to the concept of any new nuclear reactor and anything that would further enmesh us in the nuclear fuel cycle. There is a whole range of considerations which I have taken for granted in making this presentation. I have focused quite deliberately on some fairly narrow matters, but broadly we are totally ideologically opposed to any new nuclear reactor, to any further involvement in the nuclear fuel cycle. We are opposed to the whole thrust of government policy in this matter which appears to enmesh us further and further in the nuclear fuel cycle with respect to uranium mining, waste and the reactor. Obviously, we would oppose any new nuclear reactor proposal tooth and nail.

CHAIR—As there are no further questions, thank you, Mr Hallam.

[9.43 a.m.]

SWEENEY, Mr David, Uranium Campaigner, Australian Conservation Foundation

CHAIR—Mr Sweeney, I welcome you on behalf of the committee. The committee has received a submission from the Australian Conservation Foundation dated 7 April 1999. Do you wish to propose any amendment?

Mr Sweeney—No.

CHAIR—It is proposed that the submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have any objection? There being no objection, it is so ordered.

The documents read as follows—

CHAIR—Mr Sweeney, I now invite you to make a short statement in support of your submission before we proceed to questions.

Mr Sweeney—Thank you to the committee for the opportunity to present here. Many members of the committee will be aware of the ACF. It is a national conservation and environment organisation of three decades plus standing. It is represented in all states and territories in Australia. It has an active engagement in many non-government organisations and symposiums in industry working groups and also in a range of government processes and initiatives, including obviously inquiries such as this. The ACF has a policy position that has been developed over those three decades from both a position of policy and a position in response to practical experience and operational and industrial experience domestically and internationally. That position leads ACF to advocate non-nuclear alternatives at every opportunity.

We believe that we are at an opportunity here. We believe we are at a situation where we can choose a nuclear alternative or we can choose to embrace instead a non-nuclear alternative. ACF believes that there is such a range of unresolved, continuing and deep issues—environmental, economic, social, technical—that are raised by nuclear activities that we strongly feel that there is a case to say, ‘The reactor proposal does not make a compelling case that it is the only one,’ and the argument accordingly should not be approved.

Our key concerns—and perhaps I will get a chance to address them as the presentation develops—fall into a range of areas, as committee members will see with reference to the submission. Some deal with process and assessment deficiencies. Many of that sort have been highlighted by John Hallam from Friends of the Earth. Some deal with the question of the examination of the range of alternatives that exist to this proposal. Some deal with ANSTO’s operational history, safety issues, culture. Some deal with the question of cost, both opportunity and real. And a key concern for ACF in this entire issue—and I would say our fundamental concern at this juncture—is the issues raised by waste which we believe have not been adequately addressed and are of fundamental importance.

In that context we have presented evidence to the Senate Economics References Committee. We welcome the opportunity to present information to this. We have had input into the ANSTO EIS process. We have also been engaged in playing a part in shaping and engaging in public debate and discourse on this matter. Through the range of materials at our disposal and through the range of readings done, we see no compelling need for this project. We see a range of discrepancies and inadequacies with the existing assessment procedures. We see a range of unanswered questions of a fundamental nature. Before embracing this project and enmeshing Australia into what would be 40 years of operational reality of a new facility at Lucas Heights, another 35 years before a decommissioning process and a waste problem lasting tens or hundreds of thousands of years, we believe that it is only prudent, only responsible, to have the most comprehensive assessment processes possible. We do not believe that has happened to date and we feel that, before this project is further developed, there should be a comprehensive section 11 inquiry under the EP(IP) Act.

That is a brief precis of our concerns and our position. I would be very happy if the committee wanted to work through—I am mindful of the time constraints—some of the particular items. I am happy to take direction on how you would like to proceed.

CHAIR—Thank you very much. I will now open it up to questions from the committee.

Mrs CROSIO—Mr Sweeney, I can take it two ways. I know a lot of your report is in the submission you provided and you have just reiterated it in your verbal submission. What do you say in light of the report we got back from ANSTO which stated that, in the 40-year operating life of the replacement reactor, the low level waste generated will represent only 20 per cent of the waste from other sources that will be disposed at a national repository? Then they state that the total volume of this waste up to the year 2045 from the replacement reactor's operations is estimated to be around 1,200 cubic metres compared with 3,500 cubic metres already existing and around 6,000 cubic metres in total from all sources by 2045. I am saying to you that most of your submission deals with the issue that that has not been adequately answered, even from the 1993 report, and yet at the same time ANSTO are telling us that a replacement reactor, if it were to come about, is going to generate less waste than there has previously been from the existing one.

Mr Sweeney—The question of waste, as you have identified, is pivotal. On the question of waste between now and the early phase of construction and establishment, should indeed the path of a waste repository or dump and a storage facility be pursued, the early part would indeed be predominantly dominated by ANSTO's wastes generated thus far—HIFAR waste. As the committee would no doubt be aware, there is a considerable international problem with that—1,400 or thereabouts fuel rods.

Mrs CROSIO—But they have informed us in evidence that they now have that all covered by agreements with America and by one that has just been signed with the French. What is your opinion on that?

Mr Sweeney—There are a range of issues you are addressing, and I would like to come back to them. In response to that one particularly, ANSTO is confident of its waste management strategy. Its whole premise is not one that ACF shares. We do not believe that there is sufficient capability or that sufficient provision has been made for any adverse impact. In the mid-1990s there was an agreement—I believe it was in 1996—that Australian waste would be satisfactorily reprocessed at the Dounreay facility, at the top of Scotland. That is not possible now, as the committee would be aware. That situation has changed within 36 months. We are dealing with 35 years of operation, another four decades before decommissioning, and hundreds of thousands of years of storage and management issues—and a fundamental premise of ANSTO's waste management policy has changed within 36 months.

The linchpin of the international aspect of ANSTO's waste management policy is its agreements with COGEMA. Agreements with COGEMA are quite possibly open to significant change. ACF pointed out, in its original submission, that COGEMA was reported earlier this year in national and international press to be facing formal investigation for systematic engagement in activities injurious to health or likely to cause death. Formal investigation in the French legal system is one step short of being charged.

Greenpeace International have said that they will focus on the activities of COGEMA as a key polluter. A local citizens group around the area of the Cape La Hague reprocessing facility is engaging in a concerted campaign of legal initiatives. I am putting forward that if in 36 months a large state owned facility has been fundamentally unable to deliver on what was previously seen as the way forward for waste we will have a situation with COGEMA which is analogous to the situation now faced by large tobacco corporations and some agricultural chemical producers.

This utility is about to become embroiled in complex, long-running, expensive and difficult litigation. There is no question about it: the reprocessing industry has been put on notice that it will become embroiled in this litigation. I believe that there is every reasonable expectation that this litigation will have a cost factor and that this litigation may well have a very real and very rapid operational factor. Without sufficient provision, that opens up big questions for ANSTO. That lack of provision, if you like, has been identified not just by ACF and others but also in the report by CH2M Hill in looking at provision for any sort of interruption to or hiccup in ANSTO's operational plans.

I would say that their commitment to or their confidence of an international solution to their waste problem is unfounded. Within this decade, the direct experience of this agency engaging with an international utility would corroborate that. It would seem prudent to take the balance of proof. Given that we have had one international utility saying no, we may very well have another. Where do you go then and what do you do, ANSTO? That is one aspect.

In relation to other aspects of ANSTO's waste, it is clear that ANSTO is the biggest. If one separates the uranium mining tailings aspect and mineral sands aspect, then ANSTO is clearly the biggest generator of radioactive waste in Australia. In the course of community consultations in the development of this proposal, senior ANSTO officers have said that ANSTO would be responsible for the major fraction of any future national radioactive waste dump or repository. The research reactor's recommendations about the need to identify an approach for high-level waste shows what we would see as the indivisible nature of the generation of waste through ANSTO's operations and the management of waste through the push for a nuclear waste facility.

We see that some key issues in both the McKinnon report and in the Senate Select Committee on the Dangers of Radioactive Waste report to the Senate, I believe in April 1996, entitled *No Time to Waste* have not been taken on board, have not been adequately factored into and are not adequately informing this debate as it is now. To put this into its very clear perspective, it is predicated on sending ANSTO's waste overseas. It would then come back as long-lived intermediate waste in a stabilised form, suitable for emplacement in a national waste storage facility which would be co-located with a soon to be constructed national waste repository. That permeates the entire project; it is an underpinning aspect of the project.

ANSTO says, in its response document to the ACF and other comments, that it has confidence in the timely manner of the repository facility's development. I am not sure that this confidence would be shared by the traditional owners—the native title claimants—their representative bodies or indeed pastoralists and graziers in the Billa Kalina region which, as

the committee is aware, is a 60,000 square kilometre region of northern South Australia. Last Friday, the Commonwealth issued a section 9 notice to those parties, thereby triggering its coercive powers—and they are coercive—under the Lands Acquisition Act. I do not believe that is prudent, timely or appropriate.

Every study says that there must be community consultation, some degree of community endorsement and some degree of community support. The Senate report said compulsory acquisition powers should not be used in any form. The OECD nuclear energy radioactive waste working group, of which ANSTO is a member, says the same. It has a comparable position. Out of sight, out of mind is not appropriate.

ANSTO's proposal is driving the proposal for a national radioactive waste dump, and this is being seen in a disinterested way. It is fundamentally flawed. From the perspective of the ACF, there needs to be further inquiry before this project is approved or developed further. When it says in the EIS that ANSTO is Australia's largest waste generator of material that in the US would be classified not as long-lived intermediate but as high-level waste and when it says in the EIS that there is a proposal to take forward their operations for at least another four or possibly another seven or eight decades, waste issues are not the domain of this EIS. They will be viewed in the context of an assessment of any future waste repository.

A precondition of the whole ANSTO proposal is that there is a waste repository. There is a segmented, non-holistic, non-informing approach which is against the trend of international practice, where again and again in international practice—and not just in some sort of green circles—they are fundamentally at odds. I would point the committee's attention to the OECD Nuclear Energy Agency. Their primary principle in the development of a waste management strategy to deal with the radioactive materials is that the liabilities of waste management should be considered when undertaking new projects. That is the primary principle of a pro-nuclear international body.

You could say legalistically that ANSTO have considered the waste management responsibilities because they have acknowledged that there will be waste—although, because we do not know the reactor design, we are not sure of the volume or the activity level. They have acknowledged that there would be waste, so perhaps legally they have met their requirements under the act. This comes down to what we see environmental protection and the whole regime as being. Is it to be a tick a box exercise, which we firmly believe this has been to date? Is it to be an exercise where we see environmental assessment as a series of hurdles that one must clear? Or do we see it as a legislative attempt to embody and give effect to growing community expectation and to our response as citizens and as legislators for the safe handover and stewardship of the Australian environment? ACF would firmly see it as the latter. We are concerned that we are seeing a tick a box exercise that is segmented and non-informing, does not take into account international experience and is out of step with international and domestic best trends. This fundamental issue has failed to be adequately addressed.

Just to finish on one point, it says in the EIS again and again that technology aspects are novel, that technology aspects have been trialled with non-radioactive materials. It says, 'We have confidence in the timely development of a national waste dump.' Everything is predicated on an expectation for a project that is not there, to deal with a problem that

palpably is. Thirty-five kilometres away now, as you would have seen when you made that site tour, there are those rods. We need to address that situation meaningfully before we set about giving the imprimatur to the further manufacture of such materials.

Mrs CROSIO—I have two questions arising from the answer you have just given us. You say that in America the waste would be regarded as high-level waste whereas here it is regarded only as intermediate waste. Why?

Mr Sweeney—I cannot give you a clear answer to that. I am sure many in the room would. I am sure it would be a question of the definitional aspects of it. I am not sure how the Australian definition fails to engage with the American one, but I am sure that someone presenting later can.

Mrs CROSIO—I will ask ANSTO later. The other question is on legal problems that COGEMA is now involved in. Has that been going on prior to January 1999, and was it public knowledge that all of these actions have been taking place?

Mr Sweeney—It was public knowledge at least in January of 1999. The action I believe had been initiated beforehand.

Mrs CROSIO—So legal actions in the courts in France had actually been initiated.

Mr Sweeney—Yes, I believe that action had been initiated beforehand.

Mrs CROSIO—Prior to Australia signing a contract to dispose of their waste with France?

Mr Sweeney—I believe that is the case. It certainly is the case that it was alerted in the Australian press, in an article in the *Australian* newspaper in January of 1999, and I imagine that there must have been some indication before that of a notice of intention, of some statement of claim or of some talk in the local area. One would have thought that any more than cursory examination before entering into formal arrangements would have at least had some blip on the radar that there was legal action pending, if indeed that legal action had not been formally launched at that point. I doubt very much that a formal investigation goes from nowhere on 1 January to page 6 of the *Australian* on 21 January.

Mr HOLLIS—I was going to go through the points that my colleague raised. I think the crux of your report is dealing with the disposal of the waste. From what the Australian Conservation Foundation is saying, is this committee premature in holding such a hearing? I noted that in answer to a question you said that the volume and activity level of the reactor and the amount of waste it is going to produce are not known until we actually know which of the competing reactors is going to be imposed there.

Mr Sweeney—My feeling in relation to this committee's deliberations is that I welcome them. I welcomed hearing the comment earlier by Mr Lindsay that this committee would be shaping and informing the approvals process of the reactor, because I was actually very disturbed to receive confirmation from Senator Minchin's office earlier in the week that the reactor had been approved. Given the clear shortcomings that exist, I think that this

committee, along with the Senate Economics References Committee, has an importance in the process that was perhaps unintended in the original composition of the committee but is actually there as a responsibility.

You have highlighted the points that the volume and activity levels of the waste are unknown. There are other key features. I think Mr Hallam made this point very clearly. The size, the reactor design, the safety features, the fuel handling mechanisms, the fuel cladding, the volume and activity levels of the waste to be generated, the full range of costings and the siting alternatives—a whole range of pivotal material—are not here in sufficient detail to make a considered judgment. It is here to make a conceptual judgment but not to make a considered judgment that can in hindsight be pointed to that, on the basis of all available and best evidence and detail, we made a judgment which we thought was the best. At the most it is a tick a box on a concept. But the waste this ANSTO reactor generates is not conceptual; it is intensely practical.

In this whole situation we have a project that is being driven by the imperatives of the proponent's need for operational flexibility. That is a legitimate need. If I were from ANSTO, I would be arguing that case. One could make a cogent case that in order to be efficient, in order to have the most flexible modular approach, this is how we should do the assessment. But the fact is that the Environmental Protection (Impact of Proposals) Act and the Australian environmental impact assessment regime do not exist to facilitate a proponent's operational flexibility or their organisational imperatives. It exists to make the best decision for the Australian environment in the broadest possible terms on the best and most detailed information. As this stands, the fact that I can list those substantial dot points—we could go into them in great detail but there is not the time—and that there are fundamental chunks like waste that are not dealt with, is of itself sufficient to cast doubt on the process and it is sufficient to open up the process, with its dollar, environmental and social complexities and costs, to a full review.

Mr HOLLIS—I do not want to make decisions for other people, but I got the impression, rightly or wrongly, that if everything had been met Mr Hallam or his organisation would still be opposed. I think they make that point. I know it is a hypothetical question, but if all the concerns raised by the Australian Conservation Foundation—I agree with many of the points you have highlighted and no argument there—were met, would the Australian Conservation Foundation give the proposal the tick? Or are you not prepared to say that and would they still give it the thumbs down?

Mr Sweeney—The ACF is always happy to enter into theoretical discussion, and I am not being flippant, because in what you have said the 'if' has such a capital I and a capital F, given the information base that we have now, that it is hypothetical. As a campaign person and a person who would have some role in shaping that direction of ACF, I would echo the concerns that are stated in a quite elegant two-word parenthesis in the response from Senator Hill's department, from Environment Australia. Talking about the issues in relation to waste, it very understatedly says that several outstanding issues remain and says:

However, when a solution (if any) is found . . .

I would engage in that hypothetical question at that level. Can we take one step back from this, can we take one step back from a political window of opportunity to get a project approved, and look at its merits, its costs and its consequences. That has not happened.

This project is undermining people's confidence in the integrity of environmental assessment and its impartiality. These are key issues of community concern. It is more than a flag waving exercise from a bunch of greenies and it is more than a die in the ditch effort from a bunch of anti-nuclear activists. It is more than that. There are anti-nuclear concerns, there are environmental concerns, there are key procedural concerns and there are key concerns also on the development and implementation of social policy. We believe that on all those areas this is failing. We would welcome a real debate on whether Australia needs this. We would welcome a real debate on what Australia should do with its waste. I think we should be aware of the political context. I am sure the committee is, but the political context that this is happening in is really one of rapid escalation of Australia's engagement in the nuclear industry.

If I can take one week of the committee's time starting last Friday, Senator Minchin approved the Beverley uranium mine in northern South Australia, which uses an in situ leach technique which is not approved for use anywhere else in the Western world. That has been approved and is under active development. On Tuesday the same action minister approved the Lucas Heights reactor, and tomorrow 67,000 square kilometres—an area the size of Tasmania—in northern South Australia falls under the ambit of the Lands Acquisition Act and the coercive powers of the Commonwealth to facilitate and fast-track the development of a national radioactive waste dump. By anyone's standards, that is a big seven days. This is a very significant issue and it is incumbent upon us that we address the concerns that the issue of Lucas Heights embodies.

CHAIR—Mr Sweeney, we do have another question if we may proceed to that. We are due for a break, but Senator Calvert has a question.

Senator CALVERT—In your submission you talk about non-nuclear initiatives being pursued, and we heard from the previous witness about using a spallation neutron source. Do you know much about that? I do not, but it is an alternative, non-nuclear way of providing neutrons. I wonder whether it is feasible. It is said to be very expensive. Does that technology exist in other parts of the world and are any of those facilities being built at the moment that you are aware of?

Mr Sweeney—I share with you not a great deal of familiarity with spallation sources and the whole business. But what I do hear very clearly from the discussions around this issue is that the two key areas of neutron science and medical isotopes can be addressed with a variety of other approaches. I am not sure of the costings, but the costings in the ANSTO proposal do not factor in key things: the establishment of a national radioactive waste dump, the decommissioning of HIFAR, Moata and the decommissioning of a new reactor. The costings of the ANSTO thing are seen by Environment Australia as base estimates only. If we can address the medical isotope question and the neutron science question—and other people make cogent and compelling arguments to me that we can—then we embrace a non-reactor way of addressing that, and suitcase science and a combination thereof makes far more sense than an impost and a radioactive waste burden for future generations.

Mr LINDSAY—Thank you for your evidence on behalf of the ACF. It has principally been directed towards your key concern of waste management. I will address that and tell you how I feel, and then I will ask you to respond. I see the thing as a matter of scale. Yesterday I stood next to Lucas Heights high-level waste and felt perfectly safe. It was in a building not much bigger than this room.

Mrs CROSIO—That was not the high level, was it? That was the drums.

Mr LINDSAY—No, it was the other building; not the drums. Their waste is stored here in Sydney at the moment, and I feel safe next to it.

Mr HOLLIS—But you do not live in Sydney.

Mr LINDSAY—You said there has been a change, with the Scottish proposal and so on. I may be wrong, but if all the overseas reprocessing sources became unavailable we would still store our waste in Australia and we would not send it overseas. So I do not really see that as an argument. However, if the scale of the waste is in fact very small, is it really as significant as the ACF makes it? Why are you opposed to the government moving expeditiously to establish a national repository? Shouldn't we be doing it sooner rather than later? If this small quantity of waste, on the scale of things, is put in the desert in South Australia, what are your concerns about that?

Mr Sweeney—The question of volume is obviously one that compounds the issue. If there is a larger volume it is more of an issue than if there is a smaller volume. Within that context, though, we believe that there is an inherent issue with radioactive material, particularly high-level or long-lived intermediate radioactive material, irrespective of the volume, because of the hazards this particular radiological hazard supposes.

We do not see the Lucas Heights facility, to date, or any future facility, as being just a bit player in the generation of radioactive waste. It is the major fraction of Australia's contribution to the radioactive waste stream. There are also the unaddressed issues of the real questioning of decommissioning. There are going to be significant volumes of material with the decommissioning of Moata, HIFAR and of any future new reactor. So the volume issue is a real issue, as is the particular properties of radioactive material.

As regards the Commonwealth moving expeditiously to deal with the question of radioactive waste, that is being significantly undermined by two things. One is that at the same time the Commonwealth is moving ever more expeditiously to facilitate the generation of more waste. A fundamental ecological principle is reduction at source. If one can find an alternative, then one adopts the alternative and stops the problem at the pipe. We believe that that principle of reduction at source, which should underpin, is not underpinning—indeed, we are having an approach based on out of sight, out of mind.

We further believe that all the studies—the US Department of Energy, the OECD studies and the Senate select committee studies—said that, for any sense of waste management to work, there has to be some sense of community acceptance, some sense of community ownership. And that is the case, because the long-lived material is, as you know, so long lived that there has to be some sense of what is referred to in the US as a guardianship

concept or ethos. One cannot inculcate such a concept. Given that technical, regulatory and legislative mechanisms are only partial solutions because of the length of time, one must create an ethos. And one cannot create an ethos overnight, by impost or by compulsory acquisition.

CHAIR—We do have a final question.

Mr FORREST—It is a question that comes out of your submission and it is about, if you like, a policeman that could ensure that arms-length relationship your submission mentions. ARPANSA is the new entity which was created out of the old regulatory agencies. I would like to test your confidence as to whether the way it is currently structured could satisfy some of the concerns you have mentioned—as a further consultative step after we know the details of the design of this reactor and so on.

Mr Sweeney—ACF had input into the process of shaping or making recommendations about the ARPANSA Act, and there are large parts of the ARPANSA Act, particularly its intent, that we welcome. The integration of a range of authorities and agencies to ensure a more whole holistic approach to radiological protection is a good intent. We have concerns about a range of ARPANSA aspects, and for the detail of those I refer your attention to Ms Jean McSorley, who is to present later. She worked closely on that issue. I think it is a real difficult birth for ARPANSA to come from an integration of a range of agencies with their own cultures and their own modus operandi and then to be in the spotlight and to be all things to all people—certainly to be the third party umpire with overriding powers—and to be the repository of NGO confidence. I think that is a very difficult situation.

Also, we are concerned about ANSTO's role in some of the shaping of the ARPANSA material and in the selection of the ARPANSA CEO. That is not meant to be a reflection or a statement—I want to make that clear—on the personal integrity or credibility of that officer, but there is a procedural question mark there as well.

Mr FORREST—He does have enormous authority, as we discovered yesterday.

Mr Sweeney—And that is why I make that point quite clearly; it is not a personal assessment.

Mr FORREST—I share some of the concerns on the question of waste, which you quite correctly raise. Does ARPANSA have enough horsepower to sufficiently regulate that issue as well as the licence, the way the reactor operates?

Mr Sweeney—I do not believe so. I do not believe there is a proven organisational capacity or history and that is obviously because they are new. The range of activities, with the degree of intensity of nuclear development in Australia—take the last week, admittedly that is extreme, but it has been like that. I believe ARPANSA's resources are going to be very thinly stretched and I believe that they will be very hard pressed to play the role that you are positing they might play. I am not sure that they would have the capability or the resourcing to provide that role.

I think they are in a very difficult position whereby they are being seen as a court of appeal to a process where it should take two steps forward and earlier in the process we should put the thing on the table, discuss it and make a genuine decision rather than have a series of segmented, non-informing assessment modules which, if there is any problem later, is open to interpretation by ARPANSA or open to judicial review by taking some sort of Federal Court action on judicial review of a ministerial decision.

Judicial review of EP(IP) is a last step. The spirit and the intent of EP(IP) is to get it right at the start rather than put adjuncts on or flying buttresses on as it progresses. We do not believe that this has got it right from the start.

CHAIR—Thank you very much.

Proceedings suspended from 10.22 a.m. to 10.34 p.m.

JACKSON, Mr Erwin, Australian Project Coordinator, Greenpeace Australia

CHAIR—Mr Jackson, on behalf of the committee we welcome you. The committee has received a submission from Greenpeace dated 7 April 1999. Do you wish to propose any amendment to that?

Mr Jackson—No.

CHAIR—It is proposed that the submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have any objections? There being no objection, it is so ordered.

The documents read as follows—

CHAIR—I invite you now to make a short statement in support of your submission and then we will proceed to questions.

Mr Jackson—Greenpeace welcomes the opportunity to be here today. We totally welcome and are very encouraged by the fact that we can participate in the public process to determine the necessity and cost effectiveness of building a new nuclear reactor in Australia. Greenpeace hopes the committee report to the parliament on this matter will help engender a real debate about this issue within the parliament and help redress some of the issues that have surrounded Senator Minchin's statement earlier in the week.

The Greenpeace submission, which has been presented to you, contains our major objections to the proposal which I would like to quickly summarise in three dot points. One is the weakness of domestic legislation and the international regulation it is based on. This is largely due to the current situation where the regulation of the nuclear industry is performed by the same agencies that are responsible for the promotion of the nuclear industry globally. We also raise the point about potential liabilities faced by the Australian government as a legal entity responsible for compensation in any case of an accident or safety problems in the operation of the reactor or high level waste shipments to processing facilities and the unqualified cost to future generations of the disposal of high level and low level radioactive waste in Australia.

At present the worldwide trend is to close and replace reactors, not to build new ones. In the US, Europe and the Asia-Pacific region, there is a radioactive waste crisis in effect. Nations are attempting to address this issue but so far no solution which has been politically or socially acceptable has been found. It is such a global climate in which Australia or ANSTO would like to build this new reactor in Sydney. Greenpeace believes that the potential costs of such a facility should be taken into account when analysing the feasibility of the current proposal, as it is reliant on the establishment of a waste dump in Australia. These costs, as we have heard already this morning, have not been adequately addressed in the environmental impact assessment process.

Of particular concern to Greenpeace is ANSTO's agreement with COGEMA to reprocess spent nuclear fuel from the new reactor. ANSTO responded to Greenpeace concerns regarding the reprocessing in their response to the public submissions dated 28 April 1999. ANSTO sought to refute Greenpeace claims that the amount of waste returned from COGEMA would be several times the amount of waste first shipped to the French facility. ANSTO stated that the waste from the reprocessing would be six cubic metres, which is a volume of 1,300 unpacked spent fuel rods which equals seven cubic metres. ANSTO continued:

. . . the volume of the reprocessed weight is considerably lower than the volume of equivalent spent fuel prepared for direct proposals.

However, ANSTO admitted that the spent fuel would require further conditioning and packaging to enable it to be disposed of—a process which would increase its volume sevenfold. A more fundamental question is one of the transport of the waste itself and the inherent dangers of ship transport through countries such as the Pacific, et cetera.

As well as considering the mere volume of the waste returned after reprocessing, we must also consider that that waste will be radioactive for many thousands of years, as we have already heard this morning. I would also like to highlight to the committee that ANSTO has consistently ignored the issue of costs as it relates to this repository. In response to submissions and documents, ANSTO indicates that the waste will be housed in a category 6 above-ground store before eventual disposal in a geological repository. Greenpeace suggests that ANSTO must investigate and present to this committee the actual costs of this repository as part of this inquiry.

I would like to reiterate a statement which has already been made this morning. Professor Barry Allen, former Chief Research Scientist of ANSTO, stated in 1997 that the reactor will be a step into the past and it will compromise most of the imported technology and may be the last that will ever be built.

Mr LINDSAY—On the first page of your written evidence to the committee you quote a report from a Toronto newspaper. The report talked about the closure of seven nuclear reactors on safety grounds. The report said that it was not a technology problem; it was a managerial problem. This is under your dot point ‘Weakness of international regulation’. Would you agree that, if the managerial problems are solved, you are not concerned about any technological problem with nuclear reactors?

Mr Jackson—In the history of the nuclear industry you will generally find that when accidents do occur they are due to human mistakes, which all of us try our best to avoid but unfortunately they do happen. Greenpeace is certainly of the view that nuclear technology is one of the most dangerous technologies that has ever been developed. We should not need it and we should not expose ourselves to the risks, regardless of the safeguards that might be put in place, because accidents do happen. Instead of putting ourselves at risk from those accidents, we should avoid spending the money on creating the problem in the first place.

Mr LINDSAY—Under ‘Safety Problems’ you talk about:

. . . radioactive emissions large enough to set off alarms at Lucas Heights.

You say that this is obviously not a minimal safety problem. Our evidence is that it is, that there has been no danger to anybody. How do you respond to that?

Mr Jackson—As a fundamental point, if an alarm goes off there is the implication that the alarm is there for a reason, which is to warn people of some potential danger. The main points we make about safety in terms of the whole nuclear process—whether it be reactors or in particular the transport of radioactive waste—are that accidents do and will happen, we cannot guarantee they will not and, given the potentially high cost of a major accident, why spend millions of dollars on building a potential accident?

Mr LINDSAY—On the other hand, how do you respond to this: accidents can happen but they have not happened in a research reactor in the last 37 years or so? Isn’t that a fairly compelling argument that things are pretty safe?

Mr Jackson—Not at all. If you think of risk assessment across a whole range of environmental issues, you generally get at one end of the scale an assessment which says, ‘Yes, a large accident could be a fairly low risk. However, if that accident happens—and we can’t guarantee that it won’t—then you are going to have potentially catastrophic damage.’

I do not accept that just because an accident has not happened to date it will not happen, because we have seen that human error does happen. Over the last few months we have seen a number of incidents or accidents at Lucas Heights and we cannot guarantee in the future that we are not going to see a large one. Why put the people of Sydney at risk when you do not necessarily need to spend that money in the first place?

Mr LINDSAY—Finally, in your recommendations to the committee you recommend, regarding the perceived importance of medical isotopes, that they be purchased from overseas laboratories. Is this evidence that flies in the face of earlier evidence that the required isotopes can be produced from other technologies?

Mr Jackson—No, I think that is referring basically to the particular types of isotopes. We have heard already this morning that there are isotopes that cyclotrons can produce here and that the vast majority of them we would need in Australia. But, in terms of the particular isotopes that we cannot produce through cyclotrons, materials could be imported into Australia from which the isotopes could be drawn.

Mr LINDSAY—So this is really on the basis of using existing reactors to produce the isotopes and not continuing with the reactor in Australia. Is that what you are saying?

Mr Jackson—No, I do not think that we would be saying that. I think other people who will give evidence this morning will be able to go into much more detail about particular alternatives.

CHAIR—I wish to go back to the opening statement of your submission where you talk about the closure of reactors in Canada and where you say the inadequacies that led to Chernobyl are very much alive in Western nuclear industries. I notice in ANSTO’s response to concerns, such as those at point 21—‘Chernobyl accident’—they say:

The issue of whether the replacement reactor could have a Chernobyl type accident was raised. There are fundamentally significant differences in the design, operation and safety features between a 1970s Soviet designed and operated 3000 megawatt power reactor and a modern, pool type 20 megawatt research reactor—

which is what has been proposed here in Australia for Sydney.

Chernobyl, as a power reactor operated at high temperatures and pressures whereas the proposed replacement nuclear research reactor would operate at approximately 50 degrees Celsius and at normal atmospheric pressure. Chernobyl had no containment structure to prevent the release of radionuclides whereas the proposed research reactor would include a reactor building which meets stringent design parameters. . .

They go on to point out that these are two very different reactors—Chernobyl and the replacement reactor primarily for medical research. Would you like to comment on that?

Mr Jackson—There are probably two points here. That is an argument which has been used by both the French and Japanese agencies in their promotion of the nuclear industries in those respective countries. However, a French report that came out a number of years ago—and it may be mentioned in our submission—talked about the fact that, even though the designs of French and Russian nuclear reactors were different, there were no reasons why an accident on a similar scale could not happen. But I think the main point about the Lucas Heights reactor and a Chernobyl type accident is that, yes, you may not get a huge explosion like you did at Chernobyl but, in terms of the proximity to a large population and even of a medium size accident in Sydney, you would be putting very large numbers of people at risk unnecessarily.

CHAIR—But all of the evidence has suggested that, with the 1.6 kilometre buffer and the other procedures that are in place, even the worst scenario is unlikely to produce a threat to human life.

Mr Jackson—Unlikely, but they cannot guarantee it. The other point is that, if an accident does not happen at the reactor, you also have the potential for an accident when you start transporting waste around, which is a major concern of Greenpeace. This is particularly so if you are transporting the waste internationally. If you have some sort of accident on a ship and the ship sinks, say, in the Pacific, Australia could be responsible in terms of liability to the countries affected. And, as we have seen from the international response to the Japanese shipments of high level nuclear waste, many countries are opposed to such shipments basically because of the dangers that they put coastal waters and the global marine environment in. That is something that would directly come out of the development of this reactor.

CHAIR—As transport has been an issue that Greenpeace has been particularly concerned about, can you inform the committee as to how long radioactive material has been transported around the world and what documentary evidence there is of accidents in relation to that transport?

Mr Jackson—Nuclear transport has been going on for a number of years. Shipborne transport was basically initiated by the Japanese. As we have seen in the case of Germany and shipments there, they found that there was contamination and a release of radioactive materials, which has led to a major review of the German nuclear industry.

It basically boils down to the point, in terms of shipborne transport, that it is a risk that we cannot afford to take because we are dealing with a very highly radioactive substance which when released, even in small quantities into the environment, can be very harmful. They cannot guarantee that will not happen. If it does happen, it will probably be catastrophic. If we do not need the reactor in the first place and the money can be better spent on new applications in Australian science and the development of other technologies, why don't we do that and avoid the risks of a major catastrophe?

CHAIR—But you do not have any documentary evidence of such catastrophes occurring?

Mr Jackson—Not beyond what is in our submission.

CHAIR—Okay. Thank you very much.

Mrs CROSIO—Further to the matter of the waste, on page 8 of your submission you have stated under 2.3—‘High Level Waste Shipments’—that:

ANSTO has stated that "a formal agreement is already in place with the United States Government under which the United States Department of Energy has committed to taking back all of the United States origin spent fuel" for reprocessing. ANSTO also states that agreement has been reached with COGEMA (although no contract is yet in place) . . .

You put in this submission in April this year. ANSTO tells us that contract has been in place. The minister is supposed to have signed it on 26 January this year.

Mr Jackson—I am not sure about the exact details, but that could be just a mistake in the submission. I guess the basic point that has already been raised this morning—

Mrs CROSIO—So you have no further evidence of when the contract was signed?

Mr Jackson—The basic point is that, as has been pointed out already this morning, the COGEMA reprocessing facility and all reprocessing facilities in Europe are essentially under huge amounts of public scrutiny and active campaigning and you cannot guarantee that those contracts are going to be alive for the lifetime of the facility.

Mrs CROSIO—If I can take you to page 16 of your submission, in the third paragraph down you state:

The US Department of Energy is predicting the terminal decline of the nuclear industry by 2002.

We have had evidence that not only Canada and Egypt—on which they are basing the costings of the particular structure that is going to take place—but also Thailand are coming online. How does one see a decline when we have been given evidence that more are going online? Do you have other evidence that we could look into?

Mr Jackson—If you look at most of the stages of development of the world’s energy systems and the experience over the last couple of decades, because the simple costs of nuclear power generation are so high without massive government subsidies—

Mrs CROSIO—You are referring to power generation now, not to medicine.

Mr Jackson—Yes, but it is all about Australia entrenching itself in the global nuclear fuel cycle, which is part of what this reactor is doing, along with our uranium mining et cetera. In an industry which globally is in decline and where you have alternatives to nuclear and fossil fuels coming online more rapidly, Australia should be investing its money in developing new technology as opposed to entrenching ourselves in the nuclear fuel cycle.

Mrs CROSIO—What is the overall opinion of your organisation if that site which has been designated—and is now, we hear, being fast-tracked—goes ahead? I notice somewhere in your report you are referring to the area not being stable.

Mr Jackson—Greenpeace's basic position on the storage of nuclear waste is that it should be stored on-site because it basically minimises the risk of an accident en route. The way we see it, if there is waste that has already been generated, then you build an above-ground facility on-site so that you actually minimise the risk of an accident as you transport it to a new site.

Mrs CROSIO—How do you build an above-ground facility when what they are talking about in South Australia is going to be well below ground?

Mr Jackson—We do not believe in below-ground facilities because they are more out of sight, out of mind. You are talking about waste that is going to be around for thousands of years and, as already been mentioned this morning, you need to have that issue of ownership and of wanting to look after that waste for many generations. If you have got an above-ground facility which you have easy access to and which can be securely guarded et cetera, that is basically a much better bet than digging a hole in the ground and sticking it down the hole.

Mr FORREST—Let me put the proposal to Mr Jackson that one day Greenpeace wins the debate on nuclear power and the whole argument. Would you have any suggestions about what we should do with the existing waste? Let us say you have a commitment that there would be no more nuclear reactors anywhere in the world. We have still got a massive problem.

Mr Jackson—Yes.

Mr FORREST—How do you resolve that?

Mr Jackson—First of all you have to stop the problem as you do not want to create any more waste; which this new reactor will. Our basic policy position is to store it where it is being produced: above ground, in a secure place—so you have obviously minimised the risk of terrorism, et cetera; and with easy access—basically so you can monitor and make sure it is not leaking. That is our basic position and that is what we would expect to happen.

Mr FORREST—You would support the need for a repository somewhere in Australia? We have to accept our—

Mr Jackson—At Lucas Heights; not anywhere else.

CHAIR—Any more questions?

Mrs CROSIO—I think I had my answer yesterday from ANSTO about Y2K. At the end of your overall recommendations, Greenpeace suggested that HIFAR be shut down firmly at 31 December 1999, thereby reducing the risk of a Y2K-related accident.

Mr Jackson—No. They did not—

Mrs CROSIO—ANSTO gave evidence yesterday that, although we suggested replacement computers, the fact is that the reactor was built well before computers anyway,

so it is not going to be worried or disturbed by the Y2K. So why are you concerned about that?

Mr Jackson—Because, with Y2K, you basically get a whole range of interrelated systems. Research that has been done on it shows that it is not exactly what happens in the computer in the particular place which may be the problem. It is how those computers are linked to everything else. It is a question of minimising risk.

CHAIR—I understand that the reactor can actually be shut down, more or less instantly, if there is any problem. They have not only taken steps to ensure that they have dealt with the Y2K problem through work to be completed by mid-year this year, in line with the government's timetable for compliance; further to that, I understand that they can shut that reactor down very quickly. I do not think we have any other questions. Thank you very much.

[10.54 a.m.]

WILSON, Mrs Hazel, Private Citizen

Mrs Wilson—I am a long term resident of Sutherland Shire. I am appearing quite formally as an individual for a very specific purpose.

CHAIR—The committee has received a submission from you dated 3 April 1999. Do you propose any amendments?

Mrs Wilson—No, I do not; I apologise for any errors that may appear grammatically or otherwise.

CHAIR—That is fine.

Mrs Wilson—I do not like the American spellcheck that spells defence their way. I draw attention to the fact that it is difficult for individual community people to be able to meet the demands of such a committee, to prepare quite an official and formal submission.

CHAIR—Thank you. It is proposed that this submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have any objections? There being no objection, it is so ordered.

The documents read as follows—

CHAIR—That is fine. I now invite you to make a short statement in support of your submission before we proceed to questions.

Mrs Wilson—I certainly appreciate that I am able to address your committee; I recognise and appreciate it is subsequent to other processes which must occur, including those two ministerial statements which were so unfortunately issued without propriety.

I value the Public Works Committee quite personally, because I recognise that it is one of the few committees to which people who are democratically elected representatives across political boundaries can exercise a reasonable approach, rather than some of the higher ministerial delegations which have to do their work within other agendas in the cabinet.

I appreciate it and respect it because I have worked for two public works ministers in the past, at the state level. I have also worked for ministers for mineral resources and energy, and finance. I have also worked for two federal members, the member for Cook and the member for Hughes. I have been on the Sutherland Shire Council for fourteen years. I have also been pleased to continue my role in conflict resolution. I have continued to attend the Negotiated Solutions meetings which former minister Chris Schacht asked to be set up in order to allow for community consultation which had previously failed after Sutherland Shire Council let the working party slide for lack of interest.

It is difficult to do anything much through Negotiated Solutions, because it is a body which is paid for by ANSTO to conduct its information and public relations role. Negotiated Solutions are unable to write on our behalf or make representations on behalf of the community because that is not part of their charter. We have battled to get a community right to know charter between the two organisations, between the community and ANSTO, because Negotiated Solutions have attempted to bring people into their group through precinct committees within the whole of Sutherland Shire. That has not been successful because the executive officer has not put it to the board, to my knowledge—I may be wrong there, but that was what was reported to me by the public relations manager—in its present form, in the form that the entire committee unanimously agreed was a good working document.

They were people drawn from all sections of the community and were not without some responsibility. The idea of the community right to know charter was put up by the community itself based on the Canadian chemical industry model of the community's right to know. It has been a most frustrating, lengthy exercise and one in which I see no cooperation.

I believe that the relationship between the community and ANSTO has been against all the principles of proper social and community development. There is a very strange sort of culture in ANSTO that has grown over the years. If you could indulge me for a moment, I will outline how things have changed, in a historical sense.

My father was chief health and building inspector on Sutherland Shire Council for 35 years and during the time when Professor Baxter first brought the British atomic energy organisation to Australia to set it up as the Australian Atomic Energy Commission. He was very concerned because of his knowledge of the effect of leaching into the waterways around

the area and because his prime responsibility had been to protect the residents from any kind of waterway pollutant from sanitary depots, at that time an unsewered area.

His concerns have certainly been justified, as was evidenced by the Woronora River piping that ANSTO—or AAEC at the time—put in to receive the wastes from ANSTO's liquid effluent. It was only the residents who, in their concern and anger, changed that situation. Initiatives have not come from ANSTO or from the AAEC over those years. Any progress made—and I really mean almost all progress made to address residents' concerns—has only occurred because of the residents' commitment. So that myth, that the residents do not care about living near the reactor, is just as I say it: a myth. They have been active, in the face of incredible difficulties, in trying to debate with an exclusive and academic community of scientists, and, I might say, a one-eyed group when it was the Australian Atomic Energy Commission.

I do not think there would have been anybody more closely related to the community than our early political representatives. The former member for Hughes, Les Johnson, was on the council at the time of Professor Baxter's intrusion, as we consider it, into an idyllic area where there was farming, produce and green belt zoned land involving not a lot of people, only 5,000, but that was their livelihood in post-Depression years. Les Johnson became a member of the House of Representatives and was invited by, I believe, the Public Works Committee—I am not sure, but it was certainly a standing committee of parliament—to actually watch the Maralinga tests. He had the experience of seeing the test called off, just minutes before the blast, because the wind had changed. He returned with Gordon Bryant, the former chairman of that committee, some time within the next 48 hours and they went through the same exercise again.

Nobody has been closer to witnessing the effects of radiation than those people who worked and represented our community for all those years. When I worked for Ray Thorburn, the former member for Cook, he was also a member of the Public Works Committee. He understood crisis and, more importantly, crisis prevention. They came through a culture where local representatives to council often became local representatives in the upper houses of parliament and in the houses of assembly.

So I wanted to dispel that myth about 'no residential concern'. There has always been extreme residential concern, active concern, and it continues. It has occurred for 40 years. It is all recorded, right around that area, in the progress associations where the community indicated their concerns. And they still do, under different names now.

Thank you for your indulgence about the history, but do not ever let ANSTO or the Sutherland Shire Council president tell you that there is not community concern in the Sutherland Shire. Sutherland Shire Council's own surveys and ANSTO's own surveys show that 77 per cent in one and, in another, a little over 80 per cent of the people were uncomfortable about having the place. I say this because ANSTO's method of doing that survey was to ask, 'Are you slightly, very, a little concerned', in a graduated fashion. But the community was concerned—over 80 per cent of them—and it is recorded and not to be ignored under environmental laws, I believe.

The culture in ANSTO now is something that we must address. It is a sort of schizophrenic identity, scientifically. It claims it is objective, in its national strategic role, in having the privileged task of advising ministers at a national level on matters to do with international nuclear issues and development, and strategic plans. It is unique in that it has the ear of every minister. As you know, they change regularly. I do not think that, except for Aboriginal affairs, any minister has wanted to hold the position for very long.

Trying to educate ministers' staff about the situation out our way is like a continuing, rolling adult education situation. Advisers are very rarely trained, if at all, in nuclear matters and not many have a background in environmental law. They refer immediately to ANSTO. It is more than a 'Yes, Minister' scenario; it is the minister saying, 'Yes, ANSTO' most of the time. And they sit in company with them at the deputations I have been to. I do not know where the department fits in. I have been in political institutions all these years, in structural meetings. I am not biased, because I have had to fight against my own ministers in the Labor Party as well. Often I have been very tempted to walk away from it because of that. I think there was a brave young man in Senator McGauran's office who did not last very long in his career.

Where the department fits in this arrangement is a mystery to me. I know that the ministers do not answer my letters, but the department does and, for that, I am grateful to them. I wrote a letter recently that the Negotiated Solutions collective group asked me to write because they were not able to write on their behalf. I did this because I felt that group had to somehow feel they get something back by way of information from ministers. All of the time, ANSTO says, 'That is not our responsibility; it is that of the government, the minister, the cabinet.' But when we say, 'You have advised the cabinet accordingly, therefore whose responsibility is it?', they tell us that it is confidential.

I do thank the industry, science and tourism department for replying on behalf of the minister. In that letter, Mr Pettifer, the General Manager, did answer about legal liability. He said:

With regard to legal liability, the proper means of recourse for someone who is adversely affected by an event at Lucas Heights which cannot be guarded against by commercial insurance is through the common law.

You probably have that letter on file but, if you have not, I am quite prepared to table that for your information.

CHAIR—Thank you. The committee would like an opportunity to ask you questions. Are you finished with your opening statement?

Mrs Wilson—I would be very happy if you did.

CHAIR—Does the committee have some questions?

Mr HOLLIS—Yesterday I asked the Esso people, and I think I also asked the Sutherland Shire Council, what was the reaction of the local people and they seemed to have a different point of view from what you are putting. ANSTO said that, although the people might not be deliriously happy about having a reactor there, they have learnt to live with it.

From memory, the mayor of the shire said that, although some people were opposed to it, other people were very much in favour of it, and he seemed to be arguing from an economic point of view the benefits it brought to the shire.

The reactor people also made much play of the number of people who went there for an open day. They thought it was stretching the imagination a little bit too far, though, to assume that everyone who went there on an open day was necessarily expressing a favourable opinion of it. I am sure that maybe half of them went there just out of curiosity. But you seem to be saying that there is a lot of local reaction against the facility.

Mrs Wilson—Yes. First of all, I will respectfully deal with the comments of the Mayor of the Sutherland Shire Council. Sutherland Shire Council's submission was not really dealt with much yesterday. We talked a lot about public opinion, but there was a lot of very valuable legal and technical advice included in that submission, which I wholeheartedly support.

We have been grateful to have had skilled and very qualified advice over the years. It has only been through the offices of council that councillors have been able to be served with proper information. There was no mention of the complete determination by the present, very small majority in council, probably quite dependent on the president's own casting vote, to take into consideration overseas and alternative scientific and legal opinions.

That is of great distress and of grave disappointment to me because that is not democratically placing before your committee, nor on behalf of our community, the true facts. It is not a nimby thing that that particular submission from the Sutherland Shire Council presents. It is not that we are worried about the waste and are you going to take it after five years; it is an extremely professional and expert opinion. It was not given the proper treatment, I believe, by the mayor in his presentation on our behalf, which is sad.

There has been a division in our community created by the strange culture of ANSTO's tactics to divide a community. When I have not been working in political offices and for departments of both state and federal governments, I have been a director of a community crisis and community development centre. I have dealt with the personal anguish of people. The whole aim of the work of social workers and community development officers is to keep a good healthy community together.

When the AAEC was first formed we all knew each other. It was a reasonably small community. We were on first name terms. People knew each other and supported one another. When I went to funerals of nuclear scientists who had died of dreadful cancer conditions I would sit sometimes between the ANSTO or the AAEC officer and nuclear physicist and the doctor who had treated them. Such was the closeness of our community. I have heard from both the doctors and the nuclear physicists that there had been too many of such deaths and funerals. Both had said to me to continue in our residential and community citizens' concern.

There was a closeness but now we have a culture whereby the management of ANSTO actually encourages its union people and are derogative in their statements about citizens who are trying to assist, rationally, to bring about some consultative solution to the

problem—perhaps to take away the nuclear aspects of the establishment, to keep the positions and jobs there, to use all that expenditure that the Commonwealth has contributed over the years in high technology and new levels of scientific research and to protect the jobs and the small businessmen who would still benefit from it.

CHAIR—Mrs Wilson, we have another of questions from the committee. Could we move on to further questions?

Mrs Wilson—I would be happy to. I just wanted to finalised that point about an unfortunate culture of divisiveness in the community. That is a social cost.

Mr LINDSAY—Mrs Wilson, have you been to Lucas Heights?

Mrs Wilson—When I have to. I do not like to go there.

Mr LINDSAY—Have you seen anything there that concerns you?

Mrs Wilson—You do not see anything that concerns you when you visit Lucas Heights. You hear about it from the workers that are there, who are wanting someone to know. You hear about it from many sources but you do not see it.

Mr LINDSAY—So when you have been on the site you have not felt any concern?

Mrs Wilson—I do not like the way in which open days are held for the purpose of PR. I think it is scientifically educational. That is fine. That is what they attempt to do and I think they do that quite well.

Mr LINDSAY—But would you not complain if open days were not held? You would say it was a secret establishment.

Mrs Wilson—I did not say that. I say I have got nothing against the open days, for the purpose of educating people about the scientific issues, but not as a very costly PR mechanism to win over public opposition.

CHAIR—Further to Mr Lindsay's question, you said what you did feel was the concern of the workers. Can you detail that for us? What sort of concern do the workers have?

Mrs Wilson—I sit listening to ANSTO or other people so often saying that there has never been an accident. That is just not true. There are recorded accidents.

CHAIR—I think the *Hansard* will show that ANSTO made the point, yesterday in evidence, that there were not accidents which posed a threat to human life and health.

Mrs Wilson—I do not believe that.

CHAIR—I think that is probably what—

Mrs Wilson—I do not believe that and I do not think that has been satisfactorily proven. I will tell you why. In the 1970s there was a laboratory accident in which uranium hexafluoride escaped from some piping—some plastic sort of piping. The join in that pipe split overnight and it went into the laboratory and it escaped through a non-monitored vent in that laboratory.

It is only through those kinds of people that you hear the stories, and it is only the trust the community has in each other that has allowed those stories to be told. You have got to remember that the psyche of the place was under the Defence Act. Nobody was game to say anything.

Mr LINDSAY—Mrs Wilson, that would not happen any more, would it? The world has moved on.

Mrs Wilson—It would not happen because the residents and the workers would make sure it would not happen.

Mr LINDSAY—It is not a problem now. The other thing is: uranium hexafluoride is not kept on site any longer. It is not part of the process.

Mrs Wilson—Mr Lindsay, just let me go back to February: council was not informed of those accidents which occurred in February.

Mr LINDSAY—Are you aware of what the accident was?

Mrs Wilson—Yes. I have talked to the waste management head—whom I have known since he was a child—and we have had renegotiated solutions. Some people came to talk to us about it. The other thing is, Mr Lindsay—to explain for your sake—when they talk about the dose not exceeding a certain level, a lot of it is averaged out over a period of time, both with individual doses and with doses in the atmosphere, to the community. That is pretty simple, even for those of us who are not mathematicians, to grasp. Over 10 days a person who was handling those objects did not get more than the particular amount of radiation exposure. But what about the initial exposure? It is the same with gaseous emissions that are averaged out over a period of time. But what about that burst of emission which occurs? What about one of the 15 schools full of children in the area, within three miles? Accumulative doses are never ever considered.

People who talk about this—like Sister Rosalie Bertell in America, Ernest Sternglass, and Dr Hirsch; he was one of the independent advisers to Sutherland Shire Council—are all discredited. It is part of the country to discredit any opposition or any alternate opinion. It is a very unhealthy management practice.

Mr LINDSAY—In relation to 2.1 of your evidence, you say:

The existing Reactor at Lucas Heights was recognised as the major security risk during the Gulf War in 1991.

That has come out of the RRR process in 1993. Is that right?

Mrs Wilson—Yes.

Mr LINDSAY—But that was in relation to anti-terrorism matters?

Mrs Wilson—Yes, they said something about military and their response to that. I did not make any mention of military; I spoke about terrorism.

Mr LINDSAY—So you saw it as a terrorism risk, and yet ANSTO, you think, responded with evidence on a military attack?

Mrs Wilson—Yes.

Mr LINDSAY—Were you not happy with the military attack response?

Mrs Wilson—In this day and age one cannot tell the difference much, can one, in international standards?

Mr LINDSAY—Were you happy with ANSTO's response? You saw that?

Mrs Wilson—I did. I gave them the benefit of the doubt that they might have misunderstood, but I did particularly mean terrorists.

Mr LINDSAY—Finally, your evidence in relation to homes built in the vicinity of nuclear reactors, and some people saying 'they knew that they were there'. You say that is a trivial attitude on behalf of ANSTO—is that right?

Mrs Wilson—Yes. Not only ANSTO. I am excluding your committee, but with some of the committees we have had to address as citizens, one of the leading questions to the residents is: 'Well, you've lived there. You built your house there.' It is not dealing with the issue; it is trying to place blame on somebody who was unaware.

Mr LINDSAY—Thank you.

CHAIR—Mrs Wilson, I notice on page 13 of your submission that you are clearly opposed to the HIFAR reactor, and the nuclear research establishment in this particular location and, of course, any replacement reactor. I think you might have been here yesterday when we received evidence from Professor White from the Australian Academy of Science. He talked about longstanding precedents for research reactors to be located in high population centres. In fact, he talked about medium flux research reactors such as the one proposed and the one that exists there now in centres of population in Grenoble—he was, I think, in charge of that facility for a period of time—in Berlin, in Washington DC, in Colombia and in Missouri, and many other installations in universities and other centres of technical expertise. I wonder if you want to comment on Professor White's evidence yesterday?

Mrs Wilson—Unfortunately I had to leave just before Professor White gave his evidence. I am sorry about that but I had another engagement later in the evening. I think Dr John Morris, who was in charge of the setting up of the Prince Alfred Hospital cyclotrons,

was once chairman of ANSTO. It wasn't his choice that he wasn't reappointed, I might say. In his evidence to the RRR investigation he gave some very clear indications of the variety of reactors and pointed out that most of them were running on much less enriched fuel than HIFAR, which was running on an unusually highly enriched fuel for all of those years. It could never be brought down to less than 60 per cent. In fact, at one stage it was running on 80 per cent enriched fuel because, as we now know—the cabinet documents are now available—nuclear power and nuclear weapons were not disregarded in the long-term strategy of that period of time.

So whilst it may be a small reactor, and we use those emotive terms that ANSTO used, the language is really quite deceiving. They continue to talk about 'the toy' and 'the car'—the analogies of the old Austin. But in fact it was one of the few reactors in the world still operating on that highly enriched fuel. So it wasn't a comparison to make to small research reactors in universities in capital cities.

CHAIR—As I said, Professor White gave evidence yesterday that there are many similar reactors located in population centres throughout the world.

Mrs CROSIO—I am sure we will get a copy of the letter that you have tabled. Could you tell me roughly what date that letter to your organisation was signed on behalf of the minister by the department?

Mrs Wilson—It is 23 July 1998.

Mrs CROSIO—I was thinking about ANSTO. Regarding liability, the deed of indemnity was signed between the Commonwealth and ANSTO on the 27th of the eighth, 1998. When you read further into that, that is to indemnify ANSTO staff. So what that letter is clearly spelling out to you—other impressions have been given to us that they are covered by insurance—is that they are not covered unless they take civil action. That is what that is explaining?

Mrs Wilson—Yes. It is the civil action required. I don't know of anybody who has the kind of money to take civil action against the Commonwealth.

Mr FORREST—Just one question. With your submission there were two addendums, 1 and 2. I am assuming you are the author of addendum 2.

Mrs Wilson—Yes.

Mr FORREST—I have a question out of that. It is in capital letters. You talk about 'open discharge of radioactive liquid wastes from Potter Point'. What evidence do you have, what connection is there, that that is to do with Lucas Heights or the reactor?

Mrs Wilson—The outlet for the sewerage. The liquid waste was eventually belatedly put into the sewerage system and not into the Woronora Rivers pipe. The sewerage outlet from that region is at Potter Point, Cronulla.

Mr FORREST—So it is the sewerage discharge from the site at Lucas Heights but you say it is radioactive.

Mrs Wilson—Did I say that?

Mr FORREST—‘Ocean discharge of radioactive liquid wastes now occurs through the water board sewer outlet at Potters Point.’

Mrs Wilson—At the time that was written, which was when the research reactor McKinnon report review was on, that had been discovered.

Mr FORREST—This goes way back to 1993.

Mrs Wilson—Yes. Those two addenda that I have added were my submissions in 1993, to save having to redo them. Some of that may be outdated but at that particular time that was the case.

CHAIR—Thank you very much. We have completed our questions.

[11.32 p.m.]

RANKIN, Ms Genevieve, Convenor, People Against a Nuclear Reactor Inc.

CHAIR—Welcome. The committee has received a submission from People Against a Nuclear Reactor dated 7 April 1999. Do you wish to propose any amendment?

Ms Rankin—No.

CHAIR—It is proposed that the submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have any objections? There being no objection, it is so ordered.

The documents read as follows—

CHAIR—I now invite you to make a short statement in support of your submission before proceeding to questions.

Ms Rankin—I would like to thank the committee for having this hearing; it is much more convenient for us to meet in Sydney rather than in Canberra. This hearing is obviously very important to the people who have been trying to raise a lot of issues in relation to the proposed nuclear reactor to be built in Sydney.

I was extremely disappointed with the ANSTO response to our submission and, in fact, found it to be incredibly arrogant and in the sort of tone that we have become used to from this organisation. I believe that, as an organisation which is fully funded by the taxpayer and as the proposed nuclear reactor would be fully funded by the taxpayer, there should be a demand—and my hope is that this committee and these hearing will lead to a demand—that the organisation give us proper costings of their proposal and that these be fully justified.

If you look at the responses to the submission—they are similar to responses that were made before—we have absolutely no answer to the questions raised in the submission by the People Against a Nuclear Reactor. The questions raised there have been focused on cost because we understood a big part of this committee's charter is to determine whether or not we can afford a new nuclear reactor in Australia. We have been given nothing back in response.

What we have been given is estimates that were done by ANSTO in 1993 for the McKinnon review process which did not include any design estimates. We have an answer back saying that we cannot know until we know who the contractors are, until we advertise for tenders. The attachments to the submission by People Against a Nuclear Reactor are all as a result of consultancies and were prepared for Sutherland Shire Council—I am also a councillor on Sutherland Shire Council. The questions that were raised about design costs and the graphs that were given of escalation of costs in similar plants overseas have not been answered at all by ANSTO. It just says that the \$286.4 million includes the cost of the facility, neutron scattering, interface with existing site services and transition costs. If this is all we are going to be able to expect, we should be having a cost-benefit analysis done.

There has been no analysis of whether a smaller reactor could do the job. There has been no analysis of the alternatives. There have just been bland assertions that a cyclotron will not do all the things for medicine and spallation sources are expensive and will not do all the things that science need. However, we are very concerned that there has been no costing. I will give you one clear example of why the costings are so important to the local community and to the Sydney community generally.

One of the conditions that Senator Hill announced when he said that there was no negative environmental impacts in having a nuclear reactor in Sydney was that there would be no increase, for example, in the iodine 131 emissions from the site. These emissions are extremely controversial. They come out of the plant, through the production of radioisotopes at 10 times the rate of the emissions that you get of iodine 131 from places like Sellafield and Dounreay overseas. One of the arguments for the reactor is to increase the production of radioisotopes by at least four times. Yet one of the conditions that Senator Hill has put on is that there be no increase in the amount of iodine 131 coming out of the stack. It is a very

important condition because iodine 131 causes thyroid cancer and in southern Sydney at the moment there are high rates of thyroid cancers, particularly amongst women. This is just an example.

If there is going to be four times the amount of production and no increase in iodine 131, there will have to be very sophisticated filters put into the stack, much more so than any that exist at the moment. Since 1992, when Sutherland Council raised this issue about the extraordinary high levels of iodine 131 coming from that plant, there have been very genuine attempts by ANSTO to lower the levels and there has been some lowering of the level of iodine 131 gases. However, unless we know the cost of those filters and how they are going to achieve that, we believe it should be down to nil release of iodine 131. There is no way that the community or you people can assess whether or not that condition is going to be met.

In the United States there is no way that you can get a licence for building a nuclear reactor until you know the design features, the tenderers and the process that is going to be built. There is no way under our own very weak environmental federal legislation that we should be passing an environmental impact statement that does not include a description of the project which means the design features and what is going to be included. I have given you the iodine 131 example. It could be the Potter Point example that you just took up with Hazel Wilson. There is still radioactive liquid waste that goes out at Potter Point. The level of that and how it is treated depends entirely on how much money the federal government is willing to put into these safety features.

A costing of something like \$286 million cannot possibly include these sorts of cost and design features. If the requirements of the minister are going to be met, we need to be able to see a chart somewhere that says, 'This costs that much and the filters for the iodine stacks will cost that much.' I do not think it is unreasonable, when the taxpayer is footing the bill, for there to be a committee or public arena where people can see what is going into this cost estimate. To have a response to our submission from ANSTO basically giving no answer on the costs and again just assertions saying that the figures were put forward in good faith in 1992, the best possible estimate that they could make, is just not good enough without having some clear idea as to what is going into those figures. That is the main concern that we want to raise concerning costing.

There is huge public concern about the whole proposal. There is a lot of frustration for instance with Senator Minchin's announcement on Tuesday that this is more or less going ahead no matter what the community wants. I believe you looked yesterday at the surveys that have been done which show that the vast majority—86 per cent of Australian, not just local people—which included a Melbourne sample, believe that there should not be a nuclear reactor built in the suburbs. We would certainly concur with that and would plead for this committee to demand a proper cost-benefit analysis.

We are sure that these costs will escalate dramatically. As we say in our submission, in the past the costs have doubled, sometimes overnight, when ANSTO has been asked to challenge. They started out, back in 1991, saying that it would be \$75 million. When that was challenged they said it would be \$150 million. Then when it came to the McKinnon review in 1992, we were up to \$286 million but we were not to be told what that included. I

think this is a matter of grave public concern. There is an incredible lack of accountability. When we look at their annual report we see less and less information each year. As somebody said, we are up to the 1990s now and there is more accountability. But we are getting less and less information, particularly on financial matters. For instance, contracts that have been entered into with other organisations are all claimed 'commercial-in-confidence'. The uranium hexafluoride experimentation was mentioned a minute ago. There is that experimentation going on at the technology park. We have a right to know the basis of these contracts. Nobody has yet seen the contract with France to get rid of the nuclear waste.

Mrs CROSIO—Not from lack of asking.

Ms Rankin—This lack of accountability is extraordinary. Until we see those contracts about the waste, it is not clear at all. In fact, through all the submissions there is no coherent management plan for the nuclear waste. We have the waste stockpiled at the moment. There is no plan, apart from these secret contracts with France. It was said before that we had agreements with Dounreay. That French plant is under investigation by the French government, so it is not clear whether those contracts would be met in any case. It is totally irresponsible to look at building a new reactor and creating more waste when we have no management plan for the existing waste.

Mrs CROSIO—I do not know whether you were sitting in the audience yesterday and heard the evidence, but one person said that one of the things they were worried about was the cost, because ANSTO said it would be contained within that X number of dollars—\$97 from the 1992 submission. They also stated that they have been able to cost it effectively because of the Egyptian one coming on-stream. But another person giving evidence said they would be worried about cost cutbacks. What does your group think—if they have to contain it within that \$309 or \$329, with or without GST, and they have to start cutting back? Surely you would want them to provide the best right through.

Ms Rankin—That was why I gave the iodine example. The committee only needs to look at the minutes of the safety review committee to see that often there are recommendations. For instance, when the alarm was broken, at the end of the day after you had worked you would ensure that you were not contaminated. That was raised at the safety review committee.

Mrs CROSIO—How long was that broken for?

Ms Rankin—I am not clear on the exact timing, but my understanding is that it was 12 months. It was raised at about six different safety review committee meetings. Each time costs and lack of money in the budget were put forward. This cost is not a theoretical exercise: it is a straight safety issue. Either we have the money to have filters in the stacks to stop some of that iodine 131 coming out and we have the money to fix alarms when they don't work, or we don't. When that happened we had a worker going home to Engadine contaminated and they did not discover it until 9 o'clock at night. They went to his home, picked up his bedding and destroyed it. But in the meantime he had been to Engadine shopping centre, picked up the kids and done the lot. This cost matter is not a theoretical exercise: it is a straight safety issue.

Mrs CROSIO—When did that occur with that worker? Can you give a year?

Ms Rankin—It is on the public record. I think it was 1991. I would be happy to chase that up if the committee wishes me to do so. It is certainly on the public record.

Mrs CROSIO—In your evidence you presented another area of public concern. The mayor, in his submission yesterday, said that it is now evenly divided, because the community are supporting the financial and economic benefits of people being employed there. Yet I think you told us that about 80 per cent of the population—

Ms Rankin—The mayor may have been talking about the council. The council has eight members of the Liberal Party that are now voting not to oppose the reactor. They are not really planning to support it, but they have voted to support the conditions and all of that. They have major concerns about waste. But there are seven members of the council, Independents and Labor, who have voted consistently to oppose this. The eight Liberal Party members previously voted against it, until September 1997 when the government announced that the airport would not be built at Holsworthy but the reactor was going ahead.

Mr HOLLIS—It was the second prize.

Ms Rankin—It is up to other people to interpret that. The community is not divided on this. We have 800 or so people that work at ANSTO. About two-thirds of them live in the Sutherland Shire and, on the whole, they support the reactor. But there are quite a few staff there who have major concerns. This is why we are getting all the leaks about the accidents. They have major concerns about the way the plant is managed and they are not fully behind the idea of having a new nuclear reactor. But the council's own survey is showing overwhelming opposition. A strategic planning exercise is taking place at the moment with the planners. This is a very bureaucratic exercise where they go to shopping centres, they have the plan on display and there is hardly any mention of the reactor, except in passing about concern for nuclear waste. The overwhelming community response has been people's concern about the new reactor. When the Sutherland Shire environment centre do their own surveys they have over 90 per cent of people opposed to having the reactor. ANSTO's own survey showed 86 per cent. The council's survey, which is a qualitative assessment, says there is extreme concern in the community. In terms of the people, they are not evenly divided. The council position has changed in recent times, but I fully expect that it will change again.

Mrs CROSIO—At the very bottom of page 3 of the report that you gave us you made this statement about decommissioning:

Nuclear reactor operators overseas are required to lodge a bond for decommissioning when reactors are approved.

Ms Rankin—Yes. That should be required here. ANSTO says they should not have to put that forward because they are a public body and we would be able to get it out of consolidated revenue. I would have thought—and this is my whole concern about accountability—that the parliament would want to know. If it has been done as a commercial activity, such as the selling of isotopes, et cetera, they should have the same demands on them that other commercial operators would have. You would not have a reactor built in a

comparable country overseas without a bond being put up for decommissioning. I believe that parliament should be aware that it is up for that cost when it makes the decision. There is talk in these costings about the decommissioning of HIFAR. There is never any assessment of the decommissioning costs of the new reactor. Reactors, on the whole, have about a 20-year life, although we have been able to gum up our old one and keep it going. The reason they have to put up a bond in those countries is that they do have a limited life and you have to know that it is going to be done safely and that the plans are in train.

Mrs CROSIO—The ones that are putting up the bond, are they built by private enterprise and, therefore, not government guaranteed?

Ms Rankin—When we have raised this, that is ANSTO's answer—that that is done by private bodies but they are a government organisation and we have consolidated revenue. I don't think that is a good enough answer. The people here are probably better qualified than me to talk about whether they are government run or privately run. But that is what ANSTO tell us—that it is private operators that have to do that, not them.

Mr RIPOLL—You said earlier that Potter Point was still disposing of some radioactive waste. Is that correct? Do you have any evidence of that?

Ms Rankin—What happens is that there is a holding tank for the liquid waste at Lucas Heights. I understand that it is held for a certain period for some of the radioactivity to cool and then it is put out in the sewerage system. The outfall goes to Potter Point which is just near Wanda Beach. There is a lot of community concern about the Potter Point outfall—not necessarily the radioactive content of it. There have been a lot of management problems with that and Sydney Water have been under fire for the management of that plant. In fact, workers went on strike there. At one point the Water Board workers banned the contact they were having to make with the radioactive liquid from Lucas Heights.

Mr RIPOLL—Are there any reports or studies as to the level of radiation coming out at that outlet?

Ms Rankin—It is subject to a commercial-in-confidence agreement with the water board, but there have been studies of the vegetation which ANSTO says show a minimal impact on the vegetation. But you would have to ask ANSTO that.

Mr FORREST—I am equally concerned by the fact that it is raw sewage being discharged, let alone radioactive elements.

Ms Rankin—Yes, there is a lot of concern about the management of that outlet all up. Cronulla is one of the dirtiest beaches in Sydney now. It is a big problem.

Mr RIPOLL—You mentioned that there has been a lot of anecdotal evidence about accidents over periods of time. Do you have a list of what accidents occurred at what time and maybe someone to confirm them?

Ms Rankin—The Sutherland environment centre have on their web site a list, but that was done historically by Michael Priceman a couple of years ago. We could update that for

you with the more recent accidents, but there was quite a large number, and they were all ones that have been publicly reported.

Mr RIPOLL—I am concerned both about the ones that have been publicly reported and the ones that perhaps have not been but which you have anecdotal evidence on. Could we get a total list of those?

Ms Rankin—We could try. It is very difficult. I have a lot of recent statements from workers, and I did get them to put them in writing. They are anonymous statements, though, so it is very difficult. We try to keep to what is published and acknowledged by ANSTO, except when it was such a groundswell like in February where the workers were so dissatisfied because they felt there should have been a site emergency and there wasn't. They felt that the push for the new reactor was putting them at risk on site because ANSTO was going to such lengths to avoid bad publicity.

Mr RIPOLL—I am particularly interested in the one that you mentioned in 1991.

Ms Rankin—That is on the public record.

Mr RIPOLL—Or the one about the fixing of the alarm and there being no money in the budget. I would like to know whether that was the policy at the time and whether that policy has changed. Obviously, if it is a safety concern, then the money needs to be available.

Ms Rankin—Absolutely. That was what the safety review committee kept saying. Now presumably ARPANSA will say it as well. But the bottom line is that we need to know what is included in this 384. A starting price would have to be around 500, as we say in the submission. If we do not know what they are including and what they are not including, then how are we going to assess at the end of the day whether the money is there to fix the alarm system? They are the safety review committee minutes. You have the committee passing resolutions each month. They ask whether it has been fixed, and the answer is no. So they pass another resolution saying that they should fix it. ANSTO is saying that the budget is tight and that they have to do this and that first. They are saying that they have a hand-held one that is doing the job. When that was dramatically shown not to work, they fixed it.

Mr HOLLIS—Ms Rankin, there was a rally in April against the reactor. What was the attendance there, roughly?

Ms Rankin—On 11 April?

Mr HOLLIS—Yes.

Ms Rankin—There were about 600 people. It was on a Sunday morning on site at ANSTO. There is a rally today at 12 o'clock as well just outside Parliament House. I will be going down to join them when I finish.

Mr HOLLIS—One of the points—and I do not want to pursue it—ANSTO people were making to us is that they were contrasting the reaction against the proposed airport. I know from living on the south coast and driving through here all the time that every telegraph pole

used to have a sign saying 'No airport' on it. Apart from one or two signs at the rally saying 'No reactor', it seemed to me that there was a lot more protest against a proposed airport than a replacement reactor. Maybe all the energy went into fighting the airport and there was no energy left to fight the proposed reactor.

Ms Rankin—No, I think you are quite wrong there. There was a lot of energy, and this fight will go on for quite a while. There are a few things relevant to what you are saying. At the first meeting to oppose the airport, about 11 people turned up. It takes time for people's awareness to rise. The signs have been an extremely controversial issue. There are signs being put up most weeks by the residents, and they are being taken down by the council. In fact, the mayor has ordered them to be taken down.

Mr RIPOLL—Are these the anti-nuclear signs?

Ms Rankin—Anti-reactor signs.

Mrs CROSIO—I have seen some airport signs around. They have not all been taken down.

Ms Rankin—No. Advertising for car yards and everything else stays up, but council is vigilantly taking down reactor signs. Secondly, we had them taken out of the library. I have put in a complaint to the library association. When we were having a meeting, our signs were put up in the public library to advertise the meeting, and they were later taken down. There is incredible censorship going on to try to keep this issue as quiet as possible.

A lot of residents have been saying to me this week that they never really believed it would happen: a nuclear reactor in the middle of the suburbs. They knew the old one was there, but they never really believed the government would come up with a new one. Nick Minchin's announcement on Tuesday has certainly changed people's awareness of that. You need only look at the evidence that has come out from the way the government has handled the announcements of this decision. There was a background briefing program on the ABC which interviewed a senior government worker who said that there was a very conscious strategy to keep it quiet, to keep them in the dark and not have a lot of information come out.

It is an issue that some people have had a lot of difficulty with. You have to study and read the material from ANSTO. Anybody knows that noise coming out will cause you problems, but with radiation—and this is true worldwide—you do not see it and you do not smell it. You have to read the reports that show no level of exposure is safe before you are concerned. But I can assure you that the concern is there in the community. It is a different campaign. We had public meetings during the EIS process, and first of all ANSTO workers refused to attend. Helen Garnett would not attend a public meeting, and none of the government attended. But we specifically invited ANSTO at that stage. They would not attend. Then we had ANSTO workers turn up and disrupt the meetings. They would hand out their own leaflets and interject. We have this all on video; it is not secret. Those people disrupted our meetings. In a suburban community, it is quite intimidating for people to get involved in this issue, but I can assure you they will, and they are getting more confident about doing it.

Mr FORREST—We would be grateful if you could supply that 1991 incident, particularly on the health of the individual concerned after six years.

Senator CALVERT—Have the residents expressed concerns about the current reactor before? You seem to indicate that all this is generated because there is going to be a replacement reactor built. The one that is there now is 50 years old. Surely you would have more concerns about the old one than replacing it with a new, smaller and safer one than that which is already there?

Ms Rankin—At least double the size. This proposal is much larger than the current reactor, and it is to produce enormous extra quantities of radiopharmaceuticals and radioisotopes. It is a much bigger plant that we are talking about. You just heard from Hazel Wilson. I think she has been involved for about 20 years with residents who have been concerned about the old reactor—and these stories over the years and concerns about accidents and the stockpiling of nuclear waste. Lucas Heights is the nuclear waste dump of the Australia now because of the operations of the current reactor.

Senator CALVERT—Surely the people you are representing would have known the reactor was there when they went there to live.

Ms Rankin—That is a moot point. ANSTO's responsibility is to run a safe operation now. For them to be making that kind of point I think is a bit facile. However, the planning history of this was documented by a barrister in the research reactor review. The Sutherland Council, of whatever political persuasion it was, never willingly lifted the restrictions on development around the site. Those restrictions were always lifted at the behest of the state government, encouraged by the Atomic Energy Agency and then ANSTO.

Senator CALVERT—You say that ANSTO wanted more people in the area?

Ms Rankin—The point was that Sydney was growing very rapidly, and the County of Cumberland Plan was not dealing with it. The reality was that, if that land stayed locked up, it would make the reactor more and more expensive. The fact is that there would have been much more pressure to close it in the 1970s if that land was not to be available for housing.

There was the political balancing that ANSTO was doing: 'Yes, of course it's okay, we can live on top of it; they have them in America at campuses.' Then you find out that the ones they are talking about in America on university campuses are 0.000001 megawatts of power. This is 10 megawatts of power; it is a production reactor because it is producing isotopes.

Senator CALVERT—I thought we were told that it was 3.5 megawatts of power, but I might be wrong.

Ms Rankin—No, it is 10.

Mrs CROSIO—No, the existing one is 10 and the new one is 20.

Ms Rankin—We still have not been told exactly what the new one will be.

Mrs CROSIO—It is 20 in our reports.

Ms Rankin—They are saying 20, are they? But it is still a bit vague; it is, sort of, up to 20. So we have not been told exactly even how many megawatts of power it will run off. They say it will be between 14 and 20.

Getting back to the point, though, residents have different levels of information. A lot of them feel very angry. For instance, they feel that the federal government said it was safe; they did not think it would be there if it were not safe. Then they move in and start studying some of the reports and hear about some of the accidents, and there is a lot of community concern, a lot of feeling that they have not been fully informed.

Mrs CROSIO—Was the urban estate that was named Lucas Heights renamed?

Ms Rankin—Yes, the name was changed to Barden Ridge.

Mrs CROSIO—When did that occur?

Ms Rankin—It was changed in 1995. The residents pushed for it. I was mayor at the time. We sent it to the geographical names board and it was changed to Barden Ridge, after the person who released the land there.

Senator CALVERT—Just for clarification, in your submission under ‘Environmental Impacts’, you talk about ‘emissions from the production of radioisotopes from the storage of fuel rods and other nuclear waste in Little Forest Burial Ground’. What is the Little Forest Burial Ground?

Ms Rankin—Little Forest Burial Ground is across the road, it is still part of ANSTO’s Commonwealth land and they have buried nuclear waste there. There is some plutonium buried there. It is a very tightly controlled site. It has a fence around it. However, there is a lot of concern about the long-term management of that site.

The point I am trying to make there is that it is like somebody saying, ‘Well, they don’t do uranium hexafluoride there.’ If it is all happening in that area, that is the cumulative impact on the residents and that is the safety concern. This is the problem with ARPANSA: they are talking about having a licence for a new reactor and a separate licence for the isotope, if ANSTO get around to applying for it—which they will. This is all separate.

Who will be concerned about the overall cumulative impact of all this extra radiation on site? It is all very well for them to say, ‘Well, we’ve only had a teacup of radiation released in this accident, we’ve only had a syringe of radiation in another or a tankful in another.’ The concern is the cumulative impact of all of this radiation in the area.

Senator CALVERT—This is the other point of clarification I would like. I think you said earlier—and I think I have got it wrong—that one of your concerns was that there had been no cost benefit analysis.

Ms Rankin—Yes.

Senator CALVERT—But, according to the attachments, Travers Morgan reviewed the cost benefit analysis, didn't they?

Ms Rankin—Travers Morgan looked at the costings and said that there was insufficient detail.

Senator CALVERT—So there was one done, but you are critical of the way in which it was done and the level it went to.

Ms Rankin—It was done by the Sutherland Council getting the submission done. It was not done by ANSTO, and they are the public body that is responsible; they should be producing a proper cost benefit analysis.

Senator CALVERT—So the document you tendered from Travers Morgan was on the cost benefit analysis done by the Sutherland Council, not by anything that was done by ANSTO.

Ms Rankin—Yes, that was done on what they could get out of ANSTO's published figures. Their estimate was that the lowest cost would be \$300 million and the highest \$550 million. That was back in 1993.

Senator CALVERT—So you are critical of the fact that ANSTO have not really produced anything that backs up their cost.

Ms Rankin—If we were going to get an answer to these questions, presumably, like you would on most projects, you would have a piece of paper in front of you with a table saying, 'This is what the filters will cost, these are the fuel cladding costs.' You would have those listed and you would say, 'Well, if you had less megawatts of power, you might not be able to do this kind of medical research. But, then again, the cyclotron is a lot cheaper and you would get most of it out of that,' and you would have a comparison of that. We do not have that. We just have these bald assertions that other alternatives cannot do things. It is very sloppy.

Mr LINDSAY—Ms Rankin, a major part of your evidence today revolved around iodine 131, both in gas use emissions and through the sewerage system at Potter Point. Do you agree that ANSTO has an established record in monitoring these emissions?

Ms Rankin—No.

Mr LINDSAY—Why do you say that?

Ms Rankin—I say that because, in the McKinnon review, council's consultants brought forward this issue of the gaseous emissions of iodine 131 and the liquid tritium and others going out to the ashen because they found them coming out. If you compare ANSTO's published figures with places like Sellafield and Dounreay, they were enormous—they were 10 times higher coming out of our little research establishment. The reason for that was discovered to be the production of radioisotopes, which those other plants do not do.

But ANSTO's monitoring since then is all done on a computer; it is desktop monitoring. They are not out there measuring; they are doing desktop computer models. We called for actual testing of what is coming out of the stack. With the accident that occurred in February, the workers tell me that 15 to 20 giga becquerels of iodine 131 escaped up the stack. That is as much as came out in the whole 12 months before.

ANSTO's response to that has been, 'It would only be trivial overall if you average it for 10 months.' We get this sort of answer because they are doing it on a computer model; they are not measuring how much comes out. The workers only know from what went in. What is important is what is coming out because, if that comes out in a plume and, say, the wind is blowing towards a school, people will be exposed. There is absolutely no doubt about that.

I cannot stress this too strongly: the monitoring being done by ANSTO is computer desktop modelling, and it is not good enough. Nobody has confidence in it because it is ANSTO's own monitoring of itself. It is not even actual measurement; it is assessments done on a computer averaging over 12 months. It is very, very slack, from my point of view.

Mr LINDSAY—So you do not accept ANSTO's evidence that they have monitoring devices in 15 of the stacks and that they go and collect samples physically from Potter Point and analyse them on a routine weekly basis.

Ms Rankin—I would ask them this question, which we still have not had answered: on 1 February when they had that release of iodine 131 that the workers are still complaining about, how much came out? They either will not or cannot tell us. That has been in the public arena. All they are saying is, 'It was a trivial amount, believe me; trust me, I am a scientist.' If they had said, 'No, it's not 15 giga becquerels, it was 10 giga becquerels,' then you would have some confidence that they measured it. It is my belief that they did not measure it and that they will have an assessment turn up at ARPANSA averaging that over 12 months, based on whatever collections and computer modelling they have done.

Mr LINDSAY—Are you aware of the fact that in the last recorded year, 1997, in 46 of the 52 weeks of the year, the levels of iodine 131 in the atmosphere were so low that they could not be measured?

Ms Rankin—Who tells us that? Is this coming from ANSTO?

Mr LINDSAY—It is coming from the document *Environmental and effluent monitoring at Lucas Heights Science and Technology Centre* for the whole of the 1997 year, dated November 1998. It gives all of the information. It says that, in relation to the release of iodine 131, the average potential dose to the public is clearly less than 0.01 of a MSV per year. That is 100 times less than the National Health and Medical Research Council's recommended annual dose, and that is 50 per cent less than we get naturally by just sitting in the room here. Are you aware of that kind of information?

Ms Rankin—I am. I think probably Jean McSorley, who will give evidence next, would be better to talk to about the exact dosage of millisieverts. But the annual report says that they let out 15 giga becquerels. When we were told, 'Look, the reason why it is 10 times the rate of Sellafield is that they do not produce isotopes,' we said, 'Where in the world do you

have a radioisotope facility right in the middle of a suburban community?’ They have said that they are not aware of any. The big one in Canada is about 12 miles away from any local people.

With iodine 131, it would depend entirely on where you measured it and where it was going. With 0.01 millisieverts—as I say, Jean McSorley would be better qualified to comment on this—you are talking about additional dosages. It does not help me to say that we get radiation sitting in a room because I am not getting iodine 131 now. The reality is that I chose to come here today. But we do not have any choice about what the federal government imposes on us as an extra exposure. All the World Health Organisation evidence shows that any increase in radiation has health impacts.

Mr LINDSAY—Do you accept that the levels of iodine 131 found in algae collected—and several kilograms were collected—over a wide range near the outfall of Potter Point were found to be negligible, that ‘they do not pose any health risk to members of the public recreating in the ocean vicinity of the outfall or ingesting seafood from the area’? Do you accept that?

Ms Rankin—I referred previously to that study done by ANSTO. But I do not go along with the emotive language that is used in those reports, the ‘negligible impact’ et cetera. I do not want to hear ‘negligible’. What we want to hear is exactly how much and what—

Mr LINDSAY—In here are the tables telling you how much exactly they are. What I am really challenging is the credibility of your evidence in relation to iodine 131 to see what your response is.

Ms Rankin—My major concern about iodine 131, particularly the gaseous release, is that any increase of that going into the air cannot be guaranteed not to reach the population. Secondly, the key issue of my wanting to raise it this morning as an example is that, whether or not we can achieve Hill’s stated objective of not increasing those levels, I do not believe any scientist would argue that iodine 131 is not a problem. It causes thyroid cancer.

If we are going to achieve those levels, even keeping it at the current rate—which I do not believe is satisfactory—I think you should be going for no release off-site at all. But, if you were to achieve that, we would have to see how much they will be spending on the filters. I gave that as an example as to why we should be demanding a cost benefit analysis. We should be demanding the detail of what is going to make up this supposed \$385 million—because I bet you it is not filters for the stacks.

Mr LINDSAY—If there is time this afternoon, I will ask ANSTO how much iodine 131 went up in February.

Ms Rankin—Thank you.

CHAIR—Thank you very much, Ms Rankin.

[12.15 p.m.]

McSORLEY, Ms Jean Sarah, Adviser, Campaign for a Nuclear Free Future

CHAIR—Welcome. The committee has received a submission from the Campaign for a Nuclear Free Future, dated 12 April 1999. Do you wish to propose any amendment?

Ms McSorley—Not that I am aware of. There may be typographical errors.

CHAIR—We can deal with those. It is proposed that the submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have objections? There being no objection, it is so ordered.

The documents read as follows—

CHAIR—I now invite you to make a short statement in support of your submission and then we will proceed to questions.

Ms McSorley—First of all, thank you to the committee for allowing me to have the opportunity to present evidence today. I will concentrate primarily on the submission that was put forward concerning spent nuclear fuel and radioactive waste in connection with current operations at Lucas Heights and the proposed new reactor. First and foremost, I think the committee has to look very hard at whether the reprocessing contracts and the full reprocessing deal that ANSTO claim will go ahead will happen over the planned 40-year life of the proposed new reactor. In brief, there is every possibility that, over the next 40 years, the French nuclear reprocessing plant at La Hague will close. There are major social, political and environmental problems connected with the site. I should also say that there are moral issues for Australia in sending nuclear waste overseas to be dealt with in a process that we have rejected here. I can expand on those issues later.

The committee should most certainly press to see the contract that has been signed between ANSTO and COGEMA. In relation to this, I will table this copy of a contract that was signed between a French reprocessing company, at La Hague and a German utility. There is nothing in here that is commercial-in-confidence that would compromise the committee; that has been taken out. Therefore, this is offered as a template for the sorts of clauses that are contained in contracts signed between COGEMA and customer countries. I will leave that with you.

In relation to that, however, I would like to read one small piece from the contract. This is in particular reference to Helen Garnett yesterday claiming that the contract was commercial-in-confidence between ANSTO and COGEMA and that the committee could not see it. There is a confidentiality clause, but it quite clearly states that, if both the reprocessing company and the customer country agree to allow the contract to be released to relevant government authorities, it can be released. I would put it to the committee that the reason it has not been released is that ANSTO and La Hague do not want to have the committee see it.

Commercial-in-confidence can be lifted. Clause 12 says that ‘Neither party shall, without the prior written permission of the other, disclose such terms and conditions or information or drawings received from said party to any third party, except to such extent as may be required by relevant government authorities or other authorities having due legal competence or as may be necessary for the proper performance of this contract.’ I will leave that with the committee. I think you have every right to see it. I think that, legally, there is no reason why ANSTO or COGEMA should block you seeing it. We would like to table it as a public document, but perhaps you would want to see it in camera to satisfy any questions you may have.

I bring up the issue again of the possibility of La Hague closing. ANSTO referred to this in their 1996 radioactive waste review and that is mentioned in my evidence, I think it is on page 7, where they say that there is a possibility that these plants may not be open overseas. They were referring at the time to Sellafield in England, Dounreay in Scotland and La Hague. In fact, it was that suggestion in 1996 that led them to propose a reprocessing plant in late 1997 at Lucas Heights, and we all know the political fallout from that. This contract

also refers to the fact that the COGEMA reprocessing plant at La Hague may close in 2015. So there are a number of areas in which the nuclear industry itself refers to that issue.

So what would happen if the spent fuel is not reprocessed overseas? According to ANSTO—and I refer to something I believe you raised earlier, Mr Lindsay—we cannot just store the spent fuel here; it has to be conditioned. Indeed, ANSTO—and I have spoken to their senior technical officer about this—has said that they are having the reactor fuel designed in such a way that it has to be conditioned or reprocessed. That is a major political as well as technical issue for this country to face. Conditioning, for those of you who are not au fait with it, is basically semi-reprocessing: you dissolve the spent fuel in nitric acid. You simply do not extract the plutonium and uranium as would you in a normal commercial reprocessing plant or often in the case of plutonium extraction for military purposes. So conditioning is not much different from reprocessing. I think it is also interesting to note that the new Environment Protection and Biodiversity Conservation Bill does mention the potential for spent fuel conditioning or processing in Australia. So it is a possibility that it could come up in the future—certainly over the life of the new reactor.

This is particularly important because where would this happen? As we know, there is a proposed store for the return of waste from spent nuclear fuel reprocessing. However, the committee may not be aware that that store could take unprocessed spent fuel—and this is raised in the draft environmental impact statement. I am just putting this forward as a possible scenario that the spent fuel is moved off-site but it does not get moved out of the country. Therefore, wherever this store is placed would have placed next to it possibly a conditioning plant for spent fuel. Again, I think there are major political ramifications for this. Whichever area is chosen for the store will be doubtless made aware of the possibility of a conditioning plant to follow. That store is also meant to take the isotope waste from common production at the plant and future production.

I think it is also worth noting, whilst ANSTO has been relatively dismissive of the whole issue of storing and that there are no problems with it, that the actual issue of reprocessing does not rid Australia of any amount of radioactivity. The contract states quite clearly that the waste that is returned from overseas reprocessing has to contain the same amount of radioactivity as that sent overseas. Volume may be an issue in terms of certain management aspects but in terms of the actual radioactive content it solves nothing. We are still left carrying the baby, and it is a major problem.

Mrs CROSIO—Are you telling us that, for the cost of \$3 million or \$4 million per ship to send it over to be reprocessed, we are basically getting the same amount back into Australia?

Ms McSorley—In terms of radioactive inventory, yes—absolutely the same. I can show you government papers from the UK and France. I should explain: as you can tell, I am not an indigenous creature by any extent. I was born and brought up near Sellafield. We go through this whole amazing facade and charade and we get exactly the same radioactivity back. That is in the UK and French contracts.

I do not think the committee should just accept that the store is a foregone conclusion. I think there is every possibility that particularly the South Australian parliament or any other

government, when they really come to grips with what is being proposed, will kick up their heels and refuse to have the store. There is an extra facility that ANSTO have not mentioned in the hearings—they have not mentioned it in this little booklet, their response—that is, the long-lived immediate level waste that will come from the processing of isotopes will only be packaged initially in a form that will last for 50 years. In talks that I have had recently with ANSTO staff, they said that it will have to be processed again, possibly into Synroc, before it can be disposed of in a deep geological repository. That is an extra cost. I have not seen any costings from that.

In fact, let us go to the deep geological repository. We know there is absolutely no plan for this. There is no money for it. There is absolutely nothing on the drawing board. I have spoken to officials from the Department of Industry, Science and Resources. They have not got the money to be pursuing that option at present. As you know, it is one of the conditions that Senator Hill placed on giving absolute final go ahead for the reactor. Also, that process could take decades. Again, I refer the committee to the experience we have had overseas with other countries looking for nuclear waste dumps or deep geological repositories.

Why this is particularly important for ANSTO is that all forms of long-lived immediate level waste in Australia and that which will be returned from reprocessing come from ANSTO. There is no other creator of those wastes in Australia. Therefore, that cost will fall on ANSTO or us, the taxpayers. So this is not going to be a shared burden; this is going to be something that will come purely from government coffers. As I have said, the store is dependent on where a long-lived immediate low level waste and short-lived immediate level waste dump is placed—again, not a foregone conclusion.

We heard this morning that the proposal for drilling is being pushed through. There is no EIS on this currently. The South Australian parliament has not approved the store or the dump proposal. I do not know how exactly they will deal with this, this being a Commonwealth proposal, but surely it will not be forced past a state government. The Aboriginal people in the area are absolutely opposed to this idea. I do not pretend to speak for the Aboriginal people in South Australia, but I do say this: they were not a stakeholder group included in these discussions by ANSTO. ANSTO and PPK did not go to South Australia and say, 'Look, we have got a lot of radioactive waste and we are going to make a lot more radioactive waste. Can we consult you on this?'

I would also like to point out that the people in South Australia, particularly the people in the region where the dump is proposed, do not benefit from ANSTO's activities. So, whilst the people at Lucas Heights, the people of Sutherland shire, may feel that they gain significantly from having 700 jobs in the region, those benefits do not accrue to the people who will take this waste dump. I think it is absolutely important to say that, despite ANSTO's claim, the reactor and the dump are inherently linked. You heard yesterday from Mr Schriber, the mayor of Sutherland shire. One of the conditions for local political acceptance is that they move the waste off site. There are numerous documents in which ANSTO and in fact department officials raised these issues. They know there is local opposition to waste staying on site. They know it is a problem to getting the new reactor through. For ANSTO to suggest, as they do in this document, that these two issues are not linked is basically quite insulting not just to this committee but to the whole process.

What if ANSTO's plans do not go ahead? CH2M Hill, which is one of the consulting organisations that was asked to give evidence by Environment Australia on the draft environmental impact statement, state quite clearly that there should be costings and plans made for contingencies if ANSTO's nuclear waste plans do not go ahead. It is worth pointing out that, even as it stands at present, just the cost of dealing with the spent fuel alone in today's terms equals one-quarter of the cost of the new reactor—\$80 million they estimate over 40 years. That is assuming nothing goes wrong—and I think that is quite a false assumption. Therefore, I think it is essential that the committee ask ANSTO to lay out what their contingencies would be and what the cost would be.

I think it is perhaps naive of ANSTO to say that it is inconceivable for the dump to not go ahead. In 1984 I sat in front of a similar committee of the House of Commons in England when they were first discussing the proposal for a nuclear waste dump for low and short-lived immediate level waste there. It subsequently rolled on for them trying to get rid of long-lived immediate level waste—\$430 million and 15 years later they still have not got rid of any nuclear waste from the sites that they were then taking evidence on. Unless there is a miraculous shift in public opinion in this country, I cannot see that the Australian people are going to be happy with just letting this proposal go through.

The committee should get independent costs probably from this process. Whilst I have said that ANSTO should do the costings, I think it is absolutely imperative that you get, if necessary, overseas independent expert advice. I do not think that there are many people in this country that can probably give you that—and that is not a criticism of people like ARPANSA but those sorts of costings are not in their field.

Finally, the new reactor of ANSTO will only exacerbate the problem of nuclear waste. In their response to the submissions ANSTO claim that the new reactor will only add 20 per cent of the waste to the proposed national nuclear dump. That must be in terms of bulk waste, the volume of the waste. In terms of radioactivity, the isotope waste will actually contain four times the amount of radioactivity of the current isotope waste. In terms of the spent fuel, it is almost three to four times the amount of radioactivity. That is not 20 per cent; that is a huge increase over what will go into the dump. As you know, I have given a submission on national interest in the reactor. Rather than go into that, I leave the committee to ask me any questions they would like to on that issue.

CHAIR—Thank you very much, Ms McSorley. I call for questions.

Mr HOLLIS—You mentioned independent advice on costings. That is always the difficulty for a committee dealing with very technical issues. The difficulty we always face is: how independent is the independent advice? Everyone is pushing their own barrow. Those who are in favour of a reactor will produce evidence to support their case. Those who are opposed to it will produce evidence to support their case. That is human nature, not a criticism. If we wanted to get independent advice—we are a parliamentary committee, and I do not think we are going to get it from overseas—what would you suggest?

Ms McSorley—I think it is quite difficult if you do not go overseas. I suppose the only other thing you can do is direct your parliamentary research reference libraries to look at evidence that has been submitted overseas on issues such as the United States proposals for

the disposal of waste or the recent report that has come from the House of Lords in the UK concerning radioactive waste. Britain has—and they do not have the final say in these things—a longstanding Radioactive Waste Management Advisory Committee, although not perfect, certainly is significantly removed from the industry and more careful of providing information. There are a lot of major differences—obviously the geology of the countries and a whole range of environmental and social considerations—but there are some broad parameters, particularly with the American experience because they are trying to dispose of their waste as well in more arid zones.

Mr FORREST—I have been trying to explore the possibility of ARPANSA being, if you like, a policeman. I am pretty clear about this issue of waste. Spent fuel is a major one. I asked a question to a witness earlier and you were recommended as being the person who could answer it. Do you have some confidence that this new organisation that has been formed out of the previous regulatory bodies has the teeth and horsepower to impose this holistic approach as the final regulatory body? In other words, a licence does not get issued until we have a rock solid plan on waste disposal. Are changes needed to achieve that or can it do it the way it is currently set up?

Ms McSorley—One of the problems ARPANSA will face is whether it is asked to judge and licence proposals which are fairly set in stone by governments. For example, if they are asked to judge and licence a proposal to dispose of waste in a shallow burial site in South

Australia or whether they are asked to look at the issue holistically and say, ‘Is that the best option? Should the waste stay on site at Lucas Heights in above-ground dry stores?’ how much power they would need to resist a cabinet decision in that respect is something I think is yet to be tested. I doubt it. Whilst ARPANSA is certainly heading in the right direction, there are major problems with the way the regulations in the bill were drafted. Some of those still remain. There are certainly big questions over the licensing procedures and how they would go ahead. That is not to say that ARPANSA is not making the best efforts. The trouble for us is that this is the first Commonwealth instrumentality that can look at these issues for the first time in 50 years, and it is very much untested ground, whereas the proposal for the reactor was a cabinet decision. We are asking you to judge and licence it as best you can. We are not asking you to say that that should not go ahead.

In May 1997, the Radioactive Waste Management Advisory Committee in Britain was in a position to say that the proposal from British Nuclear Fuels to have a test laboratory next to Sellafield to dispose of waste should not go ahead. Those powers are more clearly defined in other countries. As I said, I do not think ARPANSA are going into this with the wrong idea, but one does have a sneaking suspicion that they are going to be forced into a corner of in some way accepting and facilitating proposals rather than stepping back and looking at whether they were the right proposals to begin with.

Mr FORREST—Does that kind of hands-off regulatory body exist anywhere in the world?

Ms McSorley—It is always a bit of a balance between organisations. Once an organisation is up and running, you facilitate it and make sure it is looked over as much as possible. Something like the Radioactive Waste Management Advisory Committee actually

has a number of independent scientists on it. It also has community experts on it. It has a very broad-ranging consultation process at different stages of proposals. I think it is very difficult. As you say, there is always going to be a point at which some people may not accept the umpire's decision, but I think RWMAC, as it is termed in the UK, is a good example of how, when you can get all the people together consulting appropriately, you can reach consensus decisions better. I have to say that that has never worked in favour of the nuclear industry so far. But there are more independent organisations. The Department of Energy in the United States, again for all its faults, at times comes down with very powerful independent decisions on the nuclear industry.

Mr FORREST—Did you have any input into the legislation that set up ARPANSA? Did you get everything you suggested in that?

Ms McSorley—No, we did not. I surely do not need to tell you that a lot of horse-trading goes on. Whilst we got through some significant changes, and we were pleased with them—and there is no doubt that the government did listen to some of those and we welcomed them—there are still many flaws, particularly in the regulations. One of the problems we had with the ARPANSA regulations was that we were told that the bill is very much a skeleton and that the meat of it would be in the regulations. In fact, we had quite a fight to get the regulations held off until they were looked at more closely. ARPANSA did put them out for public reference. Again, that was a complicated and difficult procedure.

There are still major shortcomings in areas such as radiation protection in the ARPANSA legislation that would not be contained in, say, UK legislation. For example, the set limits for radiation exposure for members of the public and workers are not best practice. ARPANSA applies the standards of the International Commission on Radiological Protection. They are not best practice. Best practice is employed through the German, the US and the UK standards, which are much lower than the internationally recommended limits. That is just an example.

Mr LINDSAY—Earlier in your submission today you talked about this contract between France and ANSTO. What do you suspect could be in that contract that this committee would have an interest in? I would have thought the commercial-in-confidence element might have been the price. Is there anything else that you think would be in confidence, that we should be mindful of and that we should try to look at? What are the sorts of things that concern you?

Ms McSorley—I will ask you to look at the clauses. The reason for this is that they are very obvious to see.

Mr LINDSAY—It is obvious, is it?

Ms McSorley—In so much as the clauses almost tell you what the problems are going to be. Clause 7 means variation in price. That also includes things which are known in the industry as cost-plus issues. I should point out that the Oslo-Paris Commission in Europe is pressing for zero discharges from La Hague and Sellafield within the next 10 to 20 years. There are significant cost ramifications for that. Those costs will be passed on to the

companies who have since sent spent fuel there. The contract said that there will be additional costs placed on the contracts because of that.

Mr LINDSAY—So that is your concern.

Ms McSorley—That is one of them. Return of the residues is another. There are certain clauses there about how quickly the waste has to come back. If you leave the waste at the reprocessing site too long, there are significant cost increases for leaving the waste there too long. Again, there is a major question mark over third party liability indemnities and insurance. The international liability regime, which the IAEA and others discuss, is changing over the years.

Force majeure, contract clauses, is another concern. If the French government say, 'We are not going to reprocess anymore. We cannot for whatever reason. We are not going to take any more spent fuel. We are going to send back the fuel unprocessed,' there will be significant problems. In fact, that is what recently caused the row between the German government and the French government, only it was the other way around: Germany was trying to get out of its reprocessing contracts and the French would not allow them. Early termination is another concern. If for some reason France says, 'We simply cannot go ahead with this because of the environmental considerations,' that is a concern. Those are the sorts of things that are in the contract.

Mr LINDSAY—Thank you.

Mrs CROSIO—I think you were here when I was asking questions of ANSTO yesterday.

Ms McSorley—Yes, I was.

Mrs CROSIO—I differ a little with my colleague. I believe anything like that should not be commercial-in-confidence and should be provided. You can always white out what we should not know about. After all, we are not looking at that, but there are some obvious areas that we need to scrutinise. We should be informed about what is happening there with contracts. I am very pleased that you have been able to bring something that we can use as a template. I will not go further on the contract. I will pursue that in other areas.

When you stated that storage is no foregone conclusion, how do you then envisage, from a technical point of view, what will happen when a reactor will be decommissioned in 2005 and a new reactor will come on board, which is stated will create a lot more spent fuel rods, isotopes? I do not understand the technical terms; I can only describe it from a layman's point of view. What cumulative problems do you see could occur after 2005 if the storage does not come about and the waste is not transferred when one nuclear reactor is decommissioned and the other one comes on, which you have stated is going to create more nuclear waste than we have had previously? What do you see as the bigger problem?

Ms McSorley—There are three major problems. One is the major political problem that the waste is not moving off-site. I make no bones about the fact that these are political and social issues as well as an environmental cost.

Mrs CROSIO—Sure, I understand that.

Ms McSorley—One would imagine that if the waste was not to go anywhere—and I am thinking of all forms of waste from the spent fuel, long-lived intermediate level waste from isotope reduction—at the very least the government would have to consider state-of-the-art, above-ground dry stores. You can buy these. They have been built around the world. The technology is there. They have been employed by many other countries. Many nuclear plant operators put highly radioactive spent nuclear fuel in them. We wished that they did not create the waste, but they are at least employing some of these better technologies. You are going to have to pay for them to be built on site. As you know, there have been problems with the way in which the spent fuel has been kept at Lucas Heights at present. It is certainly not world's best practice. There is no way that one would want to pursue that option.

Mrs CROSIO—We were told yesterday—we did not go in there—that they are stored in steel pipes, into concrete, 15 metres below the ground. So you are saying that that is not the right way to store them at the moment?

Ms McSorley—There are a number of problems, not the least of which, as you know, prior to them building the shed that covers it, is that water actually got into the seals.

Mrs CROSIO—No, I did not know. We were not told that.

Ms McSorley—A while ago there was an accident on site. I will send you the official coverage of this. There was leakage on site, as I understand it, on to a pathway of radioactive water. It was picked up and it was subsequently found that a flask carrying one of the fuel rods to another part of the site from the store had lost a certain amount of radioactive water. What had happened was that some of the spent fuel in the holes in the ground had water in them and they were taken as spent fuel to another part of the site to be dealt with. The water had got in. Some people believe it had come up from ground water.

The explanation that ANSTO put forward was that the water had got in under the seals that the International Atomic Energy Agency placed on the top of the bore holes, which are the safeguard seals. This must have happened prior to 1990 when the covering shed was built. So these fuel rods—and some of these fuel rods are quite old—decayed to an extent and caused problems. That is partly what led to the problem in the accident in February, as I understand it. Again, I can go back to notes I have taken from discussions I have had with the ANSTO managers involved. But that is roughly what happened.

There is still some debate on site as to how much of the spent fuel is in a fit state to be transported, et cetera. We would not want to repeat that for the new reactor. But if the waste does not go out, if the spent fuel does not go off-site, then you are going to want to build the best state-of-the-art spent fuel store on site. Long-lived intermediate level waste from isotope reduction is going to increase. All of those things will have to be stored more appropriately than they are stored now.

Mrs CROSIO—A previous witness giving evidence to us said you would be the person to ask this question. Why would America regard our intermediate level waste as high-level waste with the different gradings?

Ms McSorley—That is because high-level waste is mostly internationally recognised as heat generating. There is actually no heat generation in the waste which ANSTO would take back from spent fuel reprocessing. They dilute it en masse to the extent that it is not heat generating, and also they leave it to decay for a certain amount of time before it is sent for reprocessing. The real point about that is that it does not matter to an extent if it is high-level waste. It is long-lived intermediate level waste and you need to find a deep geological repository for it. That is the problem. It still has the same disposal route, ultimately, as high level waste.

Mrs CROSIO—With the reprocessing that is happening in France or in America at the moment—and we know that the process in America is going to stop gradually and we hope to continue in France with this contract—would you explain it to me again? It goes over, gets reprocessed and comes back. So theoretically, once we have it back, we are able to utilise it again, I should imagine.

Ms McSorley—No.

Mrs CROSIO—We cannot. But we are virtually storing still the same amount in the area.

Ms McSorley—There is no reprocessing in America. They abandoned commercial reprocessing in the mid-1970s—and I remember this quite clearly from the West Valley Plant. It was neither technically nor economically feasible to do.

Mrs CROSIO—So what are we sending to the United States?

Ms McSorley—We are just sending the fuel rods and they are going to be stored there. The Americans are looking at a whole range of options from conditioning to possibly direct disposal of the fuel rods in America. That is part of their non-proliferation policy. That is why they are taking those fuel rods. Britain and France, to their absolute folly, continue to reprocess, to my embarrassment being English. What happens is that they take the spent fuel. On average, about 97 per cent of the mass of a spent fuel rod is unused uranium or depleted uranium. That gets taken out. It can be used again. In the case of the Lucas Heights fuel, you have highly enriched uranium at the moment. That will be taken out and used again. What you get left with is a very small amount of plutonium—nothing like the ratios you would get from commercial fuel—and, depending on the type of fuel, about three per cent has 97 per cent of the radioactivity in it—fission product waste.

Mrs CROSIO—The three per cent we get back has 97 per cent?

Ms McSorley—Three per cent by mass of the actual fuel rod has 97 per cent of the radioactivity in it, but the deal actually is a curie for curie. Curie is a unit of radioactivity. We get curie for curie back. So the French somewhere find a little more waste and they make it up to 100 per cent. Even if they leave it at 97 per cent in those six cubic metres I

think ANSTO said we were going to get back, that is the same amount of radioactive waste that we sent over in what I believe was seven cubic metres of waste. I may be wrong on those measurements. It sounds quite a large amount. The spent fuel is not a huge amount in terms of physical bulk from ANSTO. You cannot really compare it to a commercial plant. But, in terms of radioactivity, we get the same amount back.

I know it sounds very strange to hear this sort of deal and to think people would ship spent fuel across the South Pacific forum, through the Panama Canal, take it to La Hague and allow it to contaminate areas of Europe, and it does. La Hague is the largest aerial discharger of radioactivity in the world. It far outstrips Sellafield. There are significant discharges of Krypton-85. They can be measured thousands of kilometres away. We go through all of that process and we get the waste back. We go through the whole thing again of risking an accident in the South Pacific and all the problems that that creates and also taking part in allowing spent fuel to go to a plant which has been party to creating plutonium for French nuclear weapons in the past. I am not going to bother getting into a debate about whether any Australian uranium went into that, but this plant was a party to that.

Mrs CROSIO—Ours would be a different colour.

Ms McSorley—It may be, but I doubt it. It places a huge compromise on this country as well as moral and technical onus on us.

Mr FORREST—Can you make that clear? What you are saying is that it is processed and, if you like, its irradiating density is reduced. So we have less volume to deal with but it is the same amount of radiation. Is that it?

Ms McSorley—It depends on what type of reprocessing operation you undertake. In the case of the Dounreay spent fuel, we sent 114 spent fuel rods there. We would have had a significant amount of waste come back. It would have been 85 times the volume. So had the Dounreay contract not been cancelled and all the spent fuel from HIFAR gone there, we would have had 85 times the volume with the same amount of radioactivity coming back. That was the deal ANSTO and the government—and I have to say I do not think this divides on party lines because previous governments have also allowed shipments to go ahead—were prepared go ahead with.

Mr FORREST—But 85 times the volume by the time it is properly encased and everything.

Ms McSorley—They put it in a cement matrix at Dounreay because of the type of reprocessing operations that they undertake there. That is what you would have got.

Mrs CROSIO—I have another question and, again, I was asked to ask it of you when I questioned one of our previous witnesses giving evidence. Would you know roughly when the legal action that has been taken against the French COGEMA at La Hague commenced?

Ms McSorley—There have been a number of actions taken against La Hague. My understanding is that, yes, it did start prior to January 1999. This legal action is one of many, many actions both political and legal that have been considered or taken against

nuclear reprocessing plants around the world. We, as a country, have known for many years that La Hague, Sellafield and Dounreay are three of the dirtiest nuclear establishments on the planet. In fact, when I challenged one of the ANSTO people just a month ago about the Dounreay issue and how come they had not foreseen the plant closing down, they said, 'Everybody knew that Dounreay was a dirty, broken down old plant.' But we were prepared to send our spent fuel there. Had the Scottish Environment Protection Agency and the groups there not forced the closure of that plant, we would have sent our spent fuel there. We know that La Hague is a facility that would not be licensed in this country. Regardless of whether that legal action goes ahead or not, I think we are morally bound as a country. We cannot ignore the consequences of those actions overseas.

CHAIR—Thank you very much, Ms McSorley.

Proceedings suspended from 12.53 p.m. to 1.29 p.m.

GREEN, Dr Jim (Private capacity)

CHAIR—On behalf of the committee, we welcome you, Dr Green. The committee has received a submission from you dated 31 March 1999. Do you wish to propose any amendment?

Dr Green—No. I may make additions on the strength of the discussion this afternoon.

CHAIR—It is proposed that the submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have any objections? There being no objection, it is so ordered.

The documents read as follows—

CHAIR—Dr Green, I now invite you to make a short statement in support of your submission. We will then proceed to questions.

Dr Green—It is National Science Week, as I am sure you are aware. The Lucas Heights reactor will be the biggest single investment in a science facility in Australia's history. That raises the question: what do the government's science advisers have to say on the topic? The Office of the Chief Scientist was not consulted before the decision to replace the HIFAR reactor. The Australian Science, Technology and Engineering Council was not consulted before the decision to replace the reactor, nor was the CSIRO consulted, probably because the CSIRO is on record saying that more productive research could be funded for the cost of a reactor.

Are we really expected to believe that the government wants the new reactor when it did not even consult its own science advisers? While ANSTO was getting hundreds of millions of dollars, the rest of the science and technology sector was starving. In fact, over the first two years of the coalition government, there were funding cuts of 10.9 per cent to science and innovation programs.

I have asked ANSTO for the report which justifies a new reactor in the context of dwindling funds for research science, innovation technology and so on. ANSTO does not have the report. The government does not have the report. There is no report. What ANSTO does is refers back to the 1992 ASTEC study on major national research facilities. Shortly after releasing that report, ASTEC itself said:

A decision on a new reactor must not be based solely on the needs of scientific research and industrial production. It must also take account of a number of social, political and cost factors. The detailed rigorous evaluation advocated by ASTEC has yet to be made. ASTEC sees this as the responsibility of the Research Reactor Review.

The Research Reactor Review said:

The case for a new reactor on science grounds cannot be sustained.

There are plenty of scientists such as Professor Ian Lowe, Professor Barry Allen, current and former ANSTO scientists, who are opposed to this new reactor on scientific grounds.

We are told we need a new reactor for so-called life saving nuclear medicine procedures. However, the head of the Association of Physicians in Nuclear Medicine was asked if it would be a life threatening situation if Australia did not produce isotopes locally. He said:

Probably not life threatening. I think that's over-dramatising it and that's what people have done to win an argument. I resist that.

Professor Barry Allen, a former chief research scientist at ANSTO, said:

It is reported that if we do not have the reactor people will die because they won't be getting their medical isotopes. I think that is rather unlikely.

Professor Allen goes on to say:

Certainly the \$300 million reactor will have little impact on cancer prognosis, the major killer of Australians today.

Again, there are plenty of other doctors who are quite prepared to be honest about this situation and to acknowledge that we do not need a new reactor for isotope production, as well as current and former ANSTO scientists. As to what we should do with regard to isotope supply in the absence of a domestic reactor, I will leave that question for the discussion. I am sure it will come up. Yes, there are scientists and doctors who support a new reactor but, without a single exception I am aware of, these are the scientists and doctors with a vested interest in a new reactor—that is, career and/or commercial interests.

You see this bias time and time again. I could give you a dozen examples, but I will restrict myself to just one or two. I have a letter here from a senior nuclear medicine physician congratulating me on my research saying that the argument for relying on cyclotrons plus imported isotopes is quite a compelling argument. The same senior nuclear medicine physician is quoted in the *Australian* just a couple of months after writing that letter saying it is vital we have a new reactor for isotope production. So he is a blatant liar. There are no two ways about it. The last time I spoke at a Senate inquiry a couple of weeks ago I spoke to one of the senior union representatives. He was telling me out the front that he agreed that we do not need a reactor for isotope production and that everyone knew that. But the union has written comments on this issue saying that we do need a reactor for isotope production. Again, there are no two ways about it. This is blatant dishonesty.

In my written submission to this inquiry, I have included detailed commentaries on the flimsy and sometimes dishonest arguments put forward by a number of medical and scientific institutions. When you put forward a substantive critique of the work from these scientists and doctors, what do you get in response? You get more lies and you get slander. For example, you are going to be hearing from Clarence Hardy once you have finished with me. Clarence Hardy told the Senate Economics References Committee last year that my research was funded by Greenpeace. Well, it was not funded by Greenpeace and he knows that. It was funded by an Australian postgraduate research award.

ANSTO and DIST, as it then was, submitted a document to the Senate Economics References Committee which quotes me making six comments I never made. I got an apology from ANSTO and DIST only once I had threatened to take the matter to the parliamentary Privileges Committee. And on and on it goes. Danna Vale has threatened to sue me for claiming that she has released misinformation. Well, she has released a considerable amount of misinformation. I have said that publicly on many occasions and I will say it again. Moreover, much of her work is plagiarised from ANSTO's web site, in particular a document of hers called *Facts about the nuclear industry*.

I have been compiling all the misinformation we have heard from ANSTO, from scientists, from the government and so on. This is an ongoing task of mine. At the moment, this catalogue stands at 30,000 words; that is roughly twice the length of a university honours thesis. I have asked Helen Garnett to respond to this document. She refuses. Presumably it does nothing for public relations at ANSTO for documents like this to be circulating the country, so I have asked the head of public relations at ANSTO to respond to this document. Once again, he refused.

One issue which I am determined to get an answer to sooner or later—and perhaps you can help me here—is in relation to the importation of molybdenum from South Africa. Molybdenum is the parent of technetium and is used in roughly three-quarters of all medical isotope procedures. I have been told by ANSTO scientists categorically, unequivocally and on numerous occasions that ANSTO is importing molybdenum from South Africa on a semi regular basis, roughly once or twice every month. The South African product is cheaper than the Australian product, the quality is superior and the reliability is excellent; that is what I am told by everyone who is working at ANSTO who has spoken to me about this. So this severely undermines many of ANSTO's arguments.

While I am on the question of importing isotopes, ANSTO said in September 1997 that one-third of all imported isotope shipments arrive late, so I emailed John Mulcair, head of public relations at ANSTO, on 3 September 1997 asking him to justify that assertion. Here we are, 18 or 19 months later, and I have still not got an answer to that simple question, despite asking ANSTO on the best part of a dozen occasions. Despite having that question asked as a question on notice to the federal government, there has been no straight answer. In fact ANSTO has since dropped that claim, which we can therefore assume was a blatant lie in the first place.

We will come back to the question of medical isotope production. In particular, I want to mention a new technique which is already in operation in America. I want to talk about the costs of the new reactor and I want to suggest some questions which the committee could put to ANSTO, since ANSTO has not been prepared to answer my questions on these topics. I will leave my opening statement there.

CHAIR—Thank you very much, Dr Green.

Mr FORREST—I would be interested if you could follow through with that information on costing. It is an issue that is being raised by virtually every witness.

Dr Green—First of all, on the cost of medical isotopes, there are many variables here. It is not possible to give precise costings of alternative scenarios, but what I would argue is that in the short term we rely on cyclotrons, of which we already have three in Australia, plus imported isotopes. As I mentioned, the South African molybdenum is cheaper than they produce it at ANSTO, and remember that is used in three-quarters of all nuclear medicine procedures. That really is the main argument; everything else is quite peripheral.

As for the general question of the relative cost of imported versus domestic isotopes, ANSTO refuses to supply its price list, which makes it very difficult again to make comparisons. I have asked ANSTO's major competitor—Amersham Australia—for their price list. They have willingly supplied it but ANSTO refuses. Again, I suggest that you get that price list off ANSTO. Also, when you do those calculations, you will have to bear in mind that ANSTO's products are heavily subsidised. You will actually have to get an economist to unpick those numbers for you.

As I said, ANSTO's products are heavily subsidised. There is little or no accounting for factors such as waste management, site costs and all those sorts of things. Helen Garnett said that all isotope producers around the world are subsidised. This was another one of Garnett's

infamous lies. She knows as well as I do that Amersham and several other producers are not subsidised.

I hope and expect that you have dealt with the topic of associated infrastructure with other witnesses. This is of great concern to ANSTO staff. We have \$300 million for the reactor but what about the costs for associated infrastructure, such as new hot cells to process the isotopes? As far as I am aware, no provision has been made for new hot cells and other such facilities to process medical isotopes. At the moment the facilities are being held together by string and rubber bands. They are really stretching it at the moment. It is because they cannot match their demand that they are looking to South Africa to fill the gap.

Very roughly, it would be \$10 million to \$20 million for new hot cells and there would be a whole range of other associated infrastructure which could add—it is very hard to say—about \$100 million to \$200 million. That is not to mention the question of waste disposal, bearing in mind that ANSTO's own figures show a 12-fold increase in liquid intermediate-level waste production from the years 1993 to 2025 and fourfold increases in the generation of other forms of radioactive waste. There are many cost issues arising there.

ANSTO has this Access Economics study. I have yet to unpick that report, because I simply do not have time, but it is worth quoting Professor Max Brennan, who was the CEO at ANSTO for quite some time. He described this Access Economics study in one word. He said it was 'shonky'. I strongly suggest that this committee get a detailed, rigorous and independent evaluation of the Access Economics study. Professor Ken McKinnon, who chaired the 1993 Research Reactor Review, said in a radio interview last year:

There is no way that a research reactor built in Australia would ever make a return on the investment for scientific, commercial and medical uses which would even get towards a fraction of what it would cost for a cost-benefit analysis on the normal industry basis.

So there are some of the cost issues. Again, we could talk about this at greater length if you like.

Mr FORREST—You did mention about accelerators and this question of producing TC-99M: are you confident that that can be achieved?

Dr Green—That is up the air. It is worth bearing in mind that these are quite circular arguments. ANSTO said it will conduct a review and possibly engage in collaboration with the American research team regarding this question of producing technetium with cyclotrons, but I am told by the ANSTO scientists that they went no further than a very cursory literature review. So they have not been taking this seriously at all. It is possible. For example, last year research indicated a purity of 99.999 per cent. Even the Society for Nuclear Medicine has acknowledged that this is perfectly adequate. However, ANSTO still insists on a higher level of purity.

That is cyclotron production of technetium, but I will mention other techniques. One is the Belgian Myrrha project, which is looking at spallation production of molybdenum. This would be more useful, because you are producing the longer lived parent isotope molybdenum instead of the shorter lived technetium. In Belgium they are now looking at scientific applications, but this research has direct implications for spallation production of

molybdenum and other isotopes. ANSTO's recent comments on this subject have been quite dishonest. I can supply written commentaries on that if you like.

Something which is very recent and very interesting is a process which has been developed in America. This is already up and running, so it is a step ahead of Lagunas Solar's work in California. The reference is the journal called *Nuclear Technology*. The authors are Bennett et al. It is volume 126 April 1999. You need to get a copy very quickly.

In a nutshell, they are using high energy electrons to generate gamma rays which are used to bombard enriched molybdenum 100 and thus produce technetium. This process is up and running. Each facility costs roughly \$3 million, producing some tens of curies a day, so we are talking in very rough terms about, say, 100 to 300 curies a week, perhaps more. So this one machine should produce, say, half of Australian demand, perhaps all of Australian demand. But, at \$3 million, compare that with \$300 million for the reactor. We could have one in Sydney, Melbourne, Perth—you could put one in all capital cities and some regional centres as well. You could, say, build 10 for \$30 million and you would have \$270 million left over. That is that issue. I will leave that answer there.

CHAIR—Are there any other questions?

Mrs CROSIO—I would like to take you to section 11 of the report submitted to us about the February accidents at Lucas Heights and the cover-ups. In that report you have written:

On March 16, ANSTO confirmed that the spent fuel rod remains where it fell. ANSTO says it intends to design and build a device to grasp the fuel rod and place it inside its flask.

This is part of the 1 February accident?

Dr Green—Yes.

Mrs CROSIO—And you are saying that on 16 March it was still there where it fell? Do you know what has happened since?

Dr Green—No, I have not got an update. From what ANSTO said, which was that they were going to design an instrument, presumably this would be quite a time consuming affair. I suspect that the spent fuel rod remains where it fell, but I am not 100 per cent certain.

Mr LINDSAY—Do you know how far the rod fell?

Dr Green—About 20 to 60 centimetres.

Mr LINDSAY—That much? Did you know that it did not fall out of its flask, as you say in here?

Dr Green—I would dispute that actually. You are taking ANSTO management's view of this.

Mr LINDSAY—When I was there yesterday, I wanted to see the rod on the floor and they said, ‘You can’t, because it’s all been fixed.

Dr Green—Good.

Mr LINDSAY—And they described to the committee what happened. Nobody got any radiation.

Dr Green—They got at least 51 microsieverts of radiation. They have acknowledged that. That is straight from the horse’s mouth. That is from ANSTO. So, when they say that no-one got any radiation, they are actually telling lies, aren’t they? They are very good at that, which you may well have noticed when you were on site yesterday.

Mr LINDSAY—I will ask you about that in a minute.

Mrs CROSIO—When you use measurements like that, what does 51 microsieverts mean?

Dr Green—The exposure was, say, 51 to 500 microsieverts, somewhere in that range: 500 microsieverts is half the allowable limit for members of the public, a smaller fraction for workers in the radiation industry.

Mrs CROSIO—Would I get 50 if I had an X-ray?

Dr Green—I would think that is quite possible, yes. You could get considerably more. All these things are relatively—

Mrs CROSIO—Every time I have my teeth done—a filling or something—I am getting more than 50 what you are measuring?

Dr Green—I would suspect so, yes. All these things are relative. A very small dose, a very small risk of cancer and other such iatrogenic effects.

Mrs CROSIO—I noticed also in that report, and we had heard previous evidence, how water had originally escaped into the storage where the high-level waste is stored, but you are saying here in your report that last year it was revealed that a number of the air tight tubes contained water. Do you mean it was only revealed last year, or again that something like this occurred last year?

Dr Green—Sorry could you repeat that?

Mrs CROSIO—Last year it was revealed a number of airtight tubes containing spent fuel rods had been breached by water and a number of fuel rods had corroded as a result. Is this over and above what we heard in previous evidence from the early 1990s or are you saying it is still happening?

Dr Green—ANSTO was, and probably still is, investigating these containers to see whether others contain water, and they suspect that they do because measurements have

indicated increased humidity. It was in the process of investigating these containers that they had the accident where the spent fuel rod fell out of its container.

Perhaps I can take the opportunity to say that I was speaking to an ANSTO scientist last week who was saying that his understanding is that, with a number of these spent fuel rods, their cladding has corroded to such an extent that you can see through the cladding. You can see the spent fuel rod itself. This raises other issues such as: will Cogema in France accept these fuel rods for reprocessing and, if not, then what happens; and what are the cost implications for that? Again, this is coming from ANSTO scientists—as much of my information does. How do we get some accurate information? Do we go to ANSTO management for some honest answers on this? No, you do not go to ANSTO management for honest answers on anything. There has been a 30,000 word catalogue, and Helen Garnett will not respond to it.

Mrs CROSIO—Other than what you have done in the written submission, have you applied to the offices of ANSTO offices to have a sit down *tete-a-tete*, one-to-one discussion?

Dr Green—I have written over 20 unanswered letters to ANSTO in the past 18 months. Sometimes I get inadequate answers. But occasionally I speak to ANSTO scientists who are prepared to be honest about what is happening there. Basically I have not got a single straight answer to a straight question ever from ANSTO management.

Mrs CROSIO—Just for the record, Dr Green, who defines a simple straight answer? ANSTO may say they are giving you the answer that they feel you are asking for in your question; you are defining the answer you are getting as not what you asked for in your question.

Dr Green—Generally they will not give me any answers whatsoever. I mentioned before the example of ANSTO's claim that one-third of imported isotope shipments arrive late. That is a straight question, isn't it? No answer after 18 months, and they have quietly dropped that claim. They will not say a word about the importation of molybdenum from South Africa because they know that that severely undermines their arguments.

Mrs CROSIO—We were given about six lines on isotope importation. The response said:

Radioisotope importation . . . has been suggested as either a short-term or long-term alternative strategy. The technical and operational aspects of such a strategy have been assessed in detail. The importation of radioisotopes and radiopharmaceuticals is neither a practical nor a reasonable option. High quality nuclear medicine for this and future generations must not be subjected to the vagaries of international supply.

Dr Green—Perhaps I can just take that and talk about one of ANSTO's arguments concerning short-lived isotopes and a so-called new generation of therapeutics which may or may not emerge. When you look at which isotopes could be produced by cyclotrons and/or imported, without a reactor we will have 99.7 per cent of the isotopes we have now. So the number of procedures which will be affected is minuscule and, even in those cases, you have many alternatives. If it is diagnosis you have magnetic resonance imaging, CAT scans and even your humble X-ray. And in therapeutics, again, there are alternatives. The ANSTO

scientist whom I spoke to last week was saying that you are talking 99 per cent with molybdenum, gallium and thallium—the three most important.

Mr LINDSAY—Dr Green, could I explore your claims about ANSTO being secretive and your claims about ANSTO misleading yourself, ourselves and so on. They are very serious charges, particularly in relation to misleading. With the secretive element, for the life of me I cannot see why ANSTO would want to be secretive. The reason I say that is that in relation to the fuel element that fell out on the floor, if the information was available that would better serve the community by knowing exactly what did happen—and you would support that.

Dr Green—Why did they not tell the local council? Why did they not tell the local schools? Why did they not tell the New South Wales health department?

Mr LINDSAY—That is what I want to explore. Why do you think that is happening?

Dr Green—I think because they know that it is a public relations disaster. They do not want people to know that they have spent fuel rods falling out of their containers. They do not want people to know that they are sending radioactive gases out of the stacks without putting them through the filters. Who would want to live in an area where they are having stuff-ups like this on a fairly regular basis.

Mr LINDSAY—If it is open, you are happy?

Dr Green—We do not need a reactor, that is the starting point for everything I am going to say about this. But I would much prefer that it is an open organisation and an honest one.

Mr LINDSAY—In relation to the misleading, for example, with this molybdenum from South Africa, I will undertake to ask them about that and get an answer on that. I have seen no evidence on that at all.

Mrs CROSIO—I have seen nothing.

Dr Green—Would you be so kind as to undertake not only to ask ANSTO management but also to ask some of the key scientists involved in isotope production?

Mr LINDSAY—I don't think ANSTO management would lie to the public works committee, because it is lying to the parliament if they do that.

Dr Green—I had a lot of questions submitted as questions on notice to the federal government. There was at least one blatant lie, and a lot of it was very misleading as well. I think I might have submitted that document.

Mrs CROSIO—Is that the questions which Dee Margetts put before the parliament?

Dr Green—Yes. Is that in there?

Mrs CROSIO—You have the questions but I did not see the answers.

Dr Green—It is in a short document called *More misinformation from ANSTO and the government*. To take an example, the most blatant lie in there—but perhaps it was inadvertent—concerned costs of spallation sources. I had been quoting an ANSTO document which says that a number of these spallation sources cost of the order of \$200 million. I was quoting ANSTO on that figure. ANSTO not only denies the claim but also denies ever having made the claim. This is a question on notice.

You often see politicians parroting exactly the same lies: Danna Vale was quoting this figure of one-third of imported isotope shipments arriving late, and on and on it goes. They are not claims I make lightly; they are not claims I make without having done the research and being very careful and being aware there is a real possibility of a defamation suit coming out of this. But I have said it publicly and I will do it again. If ANSTO or Danna Vale takes me to court, well, here are the facts. I do not think that I submitted this document to the committee but I am more than happy to, if you think that would be of any use.

Mr LINDSAY—We will get to the bottom of it for you. Turing to the material that went up the stack where you said that a large amount of radioactive gas was emitted from building 54 two weeks ago. Is that the only information that you have?

Dr Green—I do not have inside information from ANSTO on this. We have the statements made by the ANSTO whistleblower and the statements made by ANSTO management. I do not have any more than that. Who do you believe? You would not want to put your faith in an anonymous ANSTO employee. You would not want to put your faith in ANSTO management. Not only did ANSTO fail to notify the schools, the council or the health department, but they said that they did notify ARPANSA. But ARPANSA, as I understand it, was non-existent at the time of the spent fuel rod incident. They also said they notified the Safety Review Committee, but the Safety Review Committee was abolished last year.

Mr LINDSAY—Interesting.

Dr Green—Starting to smell a rat, Mr Lindsay?

Mr LINDSAY—I already have a note here from a previous witness to check on this gas emission and to get to the bottom of that. The other point is in relation to the Australian Academy of Science: they are supporting this proposal. I am a non-technical person. When a group as eminent as the Australian Academy of Science gives evidence which says, ‘We support the proposal,’ are you suggesting that we should discount that evidence?

Dr Green—I am suggesting you should look at the substance of their submissions, which is what I have done, and I have included that in my submission. You might want to flip through it as we speak. My understanding is that a small subcommittee of the academy developed this policy and encouraged the academy as a whole to adopt it, and the subcommittee was made up of neutron scientists as I understand it. Here we have this problem again of the scientists who are gung-ho about this new reactor being the ones who have career and/or commercial interests in the new reactor.

But leaving aside questions of vested interest, if you look at the substance of what they are saying, it is often very weak. A lot of these organisations say that we need a new reactor for medical isotopes supply when they know we do not. Also the AAS, the academy, has said that to be a useful tool and to be comparable with similar facilities overseas it would have to have a neutron flux some three times higher than is proposed. So it is implicit in the academy's own document that this is not going to be a useful tool.

Mr LINDSAY—That was not their evidence yesterday though, which is interesting. Perhaps we will be able to check that as well.

Mr FORREST—Following on from that, ANSTO have made a response to your and other people's suggestions about alternatives to a reactor. I do not know whether you have had a chance to see what they have submitted—it is now in evidence. On spallation neutron sources they say:

In general, spallation source-produced radioisotopes are in a different range from those derived from reactor-produced radioisotopes . . .

On cyclotrons they say:

Cyclotron operation would not allow research and development based on neutron beams, or fulfil the stated national strategic interest . . .

What do you say to that response? If you need more time to respond, I would be happy to receive it.

Dr Green—I have done that technical research and it gets very longwinded and very boring necessarily. But if you wanted to, for example, you could get my submissions on medicine and science to the Senate Economics References Committee which goes into this detail over literally a couple of hundred pages. But spallation generate neutrons, so you can obviously do neutron research with a spallation source. Even cyclotrons can in some circumstances produce neutrons, although that may not be a viable option. But also you have the option of mixing and matching spallations sources, cyclotrons, imported isotopes and having greater reliance on magnetic resonance imaging or particle accelerators for science—there is a plethora of options to do the same sorts of things that you do with a reactor.

CHAIR—Thank you very much, Dr Green.

Dr Green—Could I list a few questions that I would like the committee to put to ANSTO?

Mr FORREST—Would you make available the document that you referred to?

Dr Green—The misinformation?

Mr FORREST—Yes.

Dr Green—Yes. I submitted an earlier version to the Economics References Committee.

Mr FORREST—That is included in that report, is it?

Dr Green—Yes. I think it is volume 4. You could perhaps ask them for a copy.

Mr HOLLIS—Do you have the questions written out?

Dr Green—I will have to mention them very briefly—I do not have them written out properly.

CHAIR—We cannot get a copy?

Dr Green—I will just mention them. It will only take a couple of minutes. ANSTO was proposing a fourfold increase in molybdenum production or thereabouts. Currently, they cannot even handle the existing production volumes. I think one of the strategies they are expecting to employ is, say, a 10 or 15 per cent enrichment in the uranium targets for molybdenum production. This raises a number of safety concerns. Again, this is information from ANSTO scientists, so I would ask the committee to explore those safety concerns. Currently they are using targets enriched to just two per cent. They are planning to up that considerably.

ANSTO's first response will be that they have made a commitment to using low-enriched uranium targets, which covers anywhere from less than one up to 19.95. Within that, there is obviously a huge variation and some significant safety problems. I understand that, when waste water spilt out of the holding tanks recently, two staff were moved—

Mrs CROSIO—When you say recently, do you mean this year?

Dr Green—I understand this was roughly October last year. This was in the press just recently. I understand that two staff were moved out of that section of ANSTO, and I am wondering whether that was because of contamination, incompetence or both.

Mr FORREST—Which section was that?

Dr Green—It was the waste water holding tanks. I have heard a rumour from ANSTO that there was an accident involving a caesium-137 industrial source that led to contamination and also the replacement of furniture. I have mentioned the spent fuel rods which ANSTO scientists tell me are corroded to the extent that you can see the fuel rods inside their cladding. I understand that there is an internal document on the status of the spent fuel rods. The author may be P. Ripley. I would like the committee to get hold of that document and to make it public.

In regard to the lack of expertise, I understand that ANSTO is having to employ former Atomic Energy Commission staff on some of the work surrounding the decommissioning of the Moata reactor and that ANSTO intends to employ staff from the International Atomic Energy Agency to operate the new reactor. Some more information on that would be useful.

ANSTO staff members are concerned about safety on a number of fronts. Recently an ANSTO scientist told me that there are four or five senior managers at ANSTO—presumably

division chiefs—who should not be in their current positions because of their lack of knowledge, particularly with regard to safety matters. Australian radioisotopes is a particular concern here because of the dangerous nature of the processing facilities.

Mr FORREST—The question about price lists was another one in your submission.

Dr Green—I would ask you to get ANSTO's price list for its isotopes, and you can get Amersham Australia's price list either by ringing them directly or by ringing me and I will copy it for you.

CHAIR—Thank you, Dr Green. I now call representatives of the Australian Nuclear Association.

[2.05 p.m.]

HARDY, Dr Clarence, President, Australian Nuclear Association Inc.

CHAIR—Dr Hardy, on behalf of the committee I welcome you. We have some procedural things to cover. The committee has received a submission from the Australian Nuclear Association dated 7 April 1999. Do you wish to propose any amendment to that?

Dr Hardy—No, thank you.

CHAIR—It is proposed that the submission and the Australian Nuclear Science and Technology Organisation response be received, taken as read and incorporated in the transcript of evidence. Do members have any objections? There being no objection it is so ordered.

The documents read as follows—

CHAIR—I now invite you, Dr Hardy, to make a short statement in support of your submission. We will then proceed to questions.

Dr Hardy—The Australian Nuclear Association is made up of individual persons interested in nuclear science and technology. Our constitution does not allow us to have any members who are company members, so that we do not feel we would then be directly influenced by companies involved in the industry. We attempt to make available information on all aspects of nuclear science and technology through technical meetings, conferences, newsletters and training programs. All the offices are voluntary positions.

In the preamble to my submission to you I made it clear that I was representing the majority views of the association. We are fully aware that one or two of our members do have some slightly different views. They have made individual submissions to you, to the EIS and to the Senate committee previously. For example, Professor Allen, Mr Fredsall, Mr Parsons and a Mr Wood made separate submissions to the EIS. I wish to point out that I am representing what the executive committee believes is the majority view of our association's members.

I would add that I myself have had some 40 years experience in nuclear science and technology, working in the United Kingdom, the United States and Australia. I did work for the AAEC and ANSTO and was at times in charge of isotope production, isotope applications research, and interactions with industry and with the medical community. I have been a private consultant for the last seven years and I have no direct involvement with ANSTO.

I am also a member of two international committees on radioactive waste management, and I continue to monitor closely the world situation, not only on research reactors but on nuclear power and isotope applications. I would therefore be pleased to comment on any issues that have been brought up in this committee's hearings, and particularly on the issues of radioactive waste, cyclotrons, nuclear research reactors overseas and so on because I feel that I can give you the impressions of the majority views of our members, which have experienced totally many thousands of person years actually working in the industry and not just reading papers in the literature—however valuable this may be.

CHAIR—Can I explore with you, as you raised it in your submission, the issue of the treatment of spent fuel and particularly its being sent to COGEMA or the arrangements with COGEMA in France to reprocess the spent fuel overseas. Several witnesses today have raised the issue that COGEMA is subject to some lawsuits. What knowledge do you have of this and would that interfere with COGEMA's ability to accept spent fuel from Australia and to reprocess that?

Dr Hardy—I have little extra knowledge than the other witnesses who have appeared before you. The knowledge is gained from reading the technical literature about the COGEMA operations and the La Hague spent fuel plant. I had working experience in reprocessing plants myself many years ago, but not in recent times, so I do have a general background in this area. I believe it is correct that there have been claims made against COGEMA, the operations of the reprocessing plant at La Hague and also the reprocessing plant at Sellafield, as stated by one of the witnesses earlier today.

I do not know the status of those legal claims, and I believe there will be some discussions in the courts about the operations. I know that both the French and the British authorities are endeavouring to improve their operations there. This is required by international best practice now, which is different from what it was regarded to be perhaps 10 or 20 years ago, so they are attempting to improve their operations. I cannot give you any more details about those possible lawsuits.

I would add, though, that you have to recognise that France has a very great stake in maintaining that plant in a thorough working condition and operating it economically for its own program. It has one of the largest nuclear power programs in the world. So the basic purpose of that plant is to reprocess France's large and increasing future load of spent fuel. The research reactor component is a very tiny component which COGEMA is trying to add—if you like, an extra business, handling research reactor fuel. In Europe in general there are a large number of research reactors and there is a large amount of spent fuel from research reactors, but it is only a small amount compared with the vast amount of fuel coming from the French nuclear program.

CHAIR—I suppose what we are interested in here, Dr Hardy, is whether or not in your view the legal action against COGEMA may threaten the management of Australia's spent fuel rods in the future. Do you see this as a risk and can you give us some idea of what that risk might be?

Dr Hardy—It is obviously a risk just as, originally, a year or so ago ANSTO believed, in good faith, that they could send UK-origin spent fuel from HIFAR back to Britain to be reprocessed in Dounreay. In good faith they were going to sign a contract. Circumstances overtook them, and the government in Britain decided that it would not continue operating that old plant, and that option was cut off.

CHAIR—Is that likely to happen with COGEMA in France?

Dr Hardy—So ANSTO then looked at other viable options. There was more than one option and the preferred option, they decided, obviously, was that they would try to get an agreement with COGEMA. They did so, and signed one earlier this year. They believe that is the best option at the moment, and the government appears to have agreed that they would supply the funds to process that spent fuel from the existing reactor. There is obviously a risk that something could go wrong with that contract or with the operation of the plant. I think what I want to give you is the impression that the operation of that plant at La Hague really does not depend upon one, very tiny contract with Australia or with other countries.

CHAIR—I do not think that is the issue. I think the issue is more one of COGEMA's capacity to continue to operate and receive this fuel because of legal action against it from within its own country.

Dr Hardy—Madam Chair, I am trying to explain this—maybe I am not doing it very quickly. I am trying to give you an impression that France has a very vested interest in keeping the La Hague reprocessing plant open for the next 20, 30 or 50 years for its own major power program. If that plant were shut down, it would materially affect the ability of the French government to operate nuclear power stations in France, which produce at the

present time over 80 per cent of its nuclear electricity. If the French government or the regulatory bodies in France said, 'If you're not going to run that plant, you can't operate your nuclear power stations,' France would be in serious trouble. That is a far bigger risk for France than is the risk to Australia if we cannot get our small amount of research reactor fuel reprocessed. So I am saying that there is a risk but that the risk, in my opinion, is not high at the moment.

Circumstances may change. What happens, witnesses have asked, if that is cancelled and COGEMA cannot take Australia's waste in good faith, they are not allowed to continue operating the plant and they have to say to Australia, 'Sorry'? What does Australia do? It has a number of options; would you like me to explain these? Or you could ask ANSTO to explain them.

CHAIR—You could, perhaps, briefly outline those options, but I want to pursue one more point over this.

Mrs CROSIO—I want to pursue that same argument if you want to keep it going.

Dr Hardy—So Britain has been cut off, France has been cut off, the US will not take them back after 2007—and it would take back only US-origin fuel anyway; it would not take back UK-origin fuel or the research replacement reactor fuel. America is cut off, Britain is cut off and France is cut off; hypothetically, what are your options? You could go to some other country that would be prepared to offer you a contract. I can only hypothesise which those countries would be. I think there probably would be only two or three countries that might even be able to offer such contracts. One would be Russia, which does not have a good record of reprocessing, I will admit that. It could be so desperate to earn foreign currency that it would sign a contract with Australia to take the waste away. Whether or not it would have a clause put in that it would send an equivalent amount of waste back, I do not know.

Mrs CROSIO—We would not have a moral obligation clause put in somewhere along the line, would we?

Dr Hardy—The reason France or Britain wanted clauses in that the waste must be returned in equivalent amount to Australia was the concerns of the citizens in France or in Britain who do not want everybody's waste being left in their countries when they did not generate that waste—somebody else did. So they have the moral obligation to say, 'We don't want you to do this; we want you to send it back.'

CHAIR—I think this is the point that we wanted to explore. I think we can leave that bit there, if you do not mind, because I know other members will have questions.

Dr Hardy—That is one option: get someone else such as Russia, China or even Japan to take a contract. Or building a little reprocessing plant in Australia is an option. You have to consider it. The present government has said that it will not follow that option. It said last year that, for the time being, it is not going to consider that. And it would not be economic, anyway.

CHAIR—Thank you. The other issue in relation to this is that we heard evidence today that, even when Australia sends its spent fuel over to France or wherever for reprocessing, the material that is returned is still highly radioactive—in fact, it is really not in a much better state than when it went. Would you like to comment on that?

Dr Hardy—Yes. It is radioactive waste being returned.

CHAIR—I just want to make another point here: the government is going to set aside \$88 million, I think, to send this material offshore for reprocessing and then it will come back. I do not think there is anything clear in any of the material we have, but it would appear from evidence we have heard today that it will come back into Australia and then more money will have to be allocated to treat that material, and to store it in any event in Australia, and it will still have pretty much the same degree of radioactivity as it had before it was sent away for reprocessing.

Dr Hardy—Basically, you are correct. The object of sending it overseas is to reprocess it overseas for a sum of money. It will be sent back in a slightly different physical form, in a slightly different container and it will have roughly the equivalent amount of radioactivity that was sent. I have not seen the contract, so I do not know what the time frame is, but I believe it will say, ‘Within 10 years you must take back the equivalent amount of waste.’ Obviously there will be some radioactive decay in that 10 years. So what will come back is the equivalent amount to what was actually sent, I understand. I am not clear on that. I have not seen the contract as to whether the amount sent back is the same as the amount originally sent or the amount that it will be, in radioactive terms, after 10 years decay, because there is a big difference between them, obviously. I think it would only be fair in such a contract that France returns to Australia the radioactive content at the end of the decay period in France, not the equivalent amount of what it received the day it arrived—there is a difference.

CHAIR—We are non-technical people, so could you explain to the committee what the purpose is in sending the spent fuel rods overseas for reprocessing?

Dr Hardy—Some advisers in ANSTO have said to the government, ‘We think the best option for Australia for this load of spent fuel which exists now, and which will be existing in the future if the reactor goes ahead, is to reprocess it to extract some valuable highly enriched uranium from the present fuel.’ It is not low enriched uranium; it has got a certain value because it has been enriched in the past. Of the two options, reprocessing or storing it as it is, you can reprocess it overseas or you can reprocess it here. I believe ANSTO did put that option to the government, saying, ‘You can reprocess it overseas, which would cost you \$88 million’—or whatever the figure was—‘or you can reprocess it here.’ I have never seen a figure quoted by ANSTO to the government, presumably in some confidential cabinet paper, which says how much it would cost if we had to reprocess it here. I have not seen that cost, but I could hazard a guess that it might be more or less than \$80 million, because it is a very specialised plant.

The government said, ‘We think public opinion would not support building a reprocessing plant like that at ANSTO.’ Sutherland Shire Council would not support it, I am sure. The local citizens would not support it, because I believe a small reprocessing plant

would have a higher risk for safety in operation and so on than a research reactor. It is a different kind of plant. So the government must have looked at the figures and said, 'We think the best option is to pay \$80 million and send it overseas, get some waste back and store it in something that we can handle in this country. We can build a suitable concrete blockhouse somewhere in the far depths of South Australia in arid land, which is a long way from Sydney. The Sutherland Shire Council will love that.' They will send all the waste to that blockhouse and keep it there under secure guard for many, many years until they can come to some decision nationally on a site to dispose of that intermediate level waste, just as they are trying to come to terms with the disposing of low level waste. I think you have to distinguish between the different kinds of waste we are talking about. On low level waste, the government has said, 'We will build a national repository. We will have shallow land disposal in an arid area which we think will be adequately safe, according to some criteria—

CHAIR—At what level would you classify these spent rods when they have been returned from France, for example, after processing?

Dr Hardy—They are not spent rods any more; they are completely different.

CHAIR—Okay. What sort of waste would you classify that as?

Dr Hardy—The spent rods are sent to overseas companies in heavily shielded casks. They are literally rods or plates of metal with uranium inside. You have probably seen the mock-up ones at Lucas Heights. They are put in shielded containers and sent away. They are spent fuel rods. Unfortunately, there has been a semantic difference between ANSTO and the research reactor review in 1993, who said, 'We recommend, ANSTO, that you should not keep calling these spent fuel rods; you should admit they are high level waste.' ANSTO has disagreed with that on conceptual terms.

Mrs CROSIO—Can I take you back here. Every time we read in a report 'spent fuel rods' we really should be reading high level waste?

Dr Hardy—I think, to be fair to ANSTO, spent fuel rods are spent fuel rods which are highly radioactive. The words 'high level waste' have commonly become known as referring to waste after spent fuel from a power reactor or a research reactor has been reprocessed and separated out into high level waste, which is fission products with very little uranium or plutonium separated on the right hand, and the unused uranium and plutonium separated on the left hand. They do not call separated uranium or plutonium high level waste, by international definition.

CHAIR—Can I rephrase it? We are getting lost here. My question was: when the material has been returned to Australia—we will just call it material—where would it go and under what category? Would it be high, medium or low?

Dr Hardy—From all the information I have seen and the definitions I know about internationally and nationally, it would be defined as long-lived intermediate level waste. If you think of three categories, low level, intermediate level and high level waste, what you define as high level waste is so radioactive that it generates heat. Therefore, not only do you

have to shield it to protect the workers but you have to have heat removal facilities—cooling and so on—while you transport it, because it can generate a lot of heat.

CHAIR—So by the time it comes back to Australia it would not be—

Dr Hardy—It goes to France. It is still nothing like as high level waste as nuclear power reactor fuel. They are quite different by an order of magnitude at least, but it is still very radioactive. It is in shielded containers. Generally speaking, there do not have to be special cooling arrangements, with special pumps and everything, on those transporters on the ships. It gets to France, it is dissolved up and you get out a small amount of waste. You get out the amount of waste that is in it in terms of radioactivity and then you let it decay. You encapsulate it, probably in something like cement, and you put it, let us say, simply in drums. It is not in especially shielded containers with water cooling or anything; it does not generate a lot of heat. It is therefore not defined as high level waste; it is defined as intermediate level waste. But it could have a long life, and therefore it is called long life intermediate waste. That comes back to Australia in a ship in drums, shielded if necessary, but with no heat removal equipment. Those drums arrive in Australia and they have to be put in, let us say, a concrete blockhouse which is secure and which is properly looked after for an indefinite period of time.

CHAIR—Thank you. That is what I wanted to know.

Mrs CROSIO—I would like to pursue that one step further. I know you were here all day yesterday as well as today when we have been asking questions and hearing evidence, so I think you know my particular feeling over this contract. You say you have not seen the contract. We are only the Public Works Committee and we are not allowed to see the contract. So I would like to continue to pursue that a little bit further. You did state in your report to us just then that with the contract with ANSTO and COGEMA really the research reactor fuel is such a very small amount that it would not be part of keeping France's refining plant La Hague going or not. If it is a very small amount, I cannot understand—perhaps you can enlighten me—why either La Hague or ANSTO would be reluctant to show us the technical contract. There would surely not be that much commercial-in-confidence. Seeing that you have studied it all, what would your opinion be?

Dr Hardy—The only commercial reason I believe could be justified would be the same as is applied to uranium sale contracts. It is a relatively competitive business—

Mrs CROSIO—But that would only take up one paragraph in the whole contract. That could be whited out and we could see the rest of it.

Dr Hardy—It could be. That is common practice in many government organisations around the world under freedom of information legislation. You either cut out or you white out things which have commercial terms saying how much Australia is going to pay to COGEMA, how many thousands of dollars per rod or whatever. That could in theory be whited out. Maybe there are other clauses which cover force majeure or cover these definitions of when you decide the level of radioactivity: is it when it arrives in France or is it after 10 years when it is ready to come back? All these finer points do have importance. Whether they regard those as commercially sensitive I do not know.

Mrs CROSIO—You in your professionalism surely would think that we as a committee investigating what is happening with the building of this new reactor would want to know whether that waste 10 years hence is going to be of a lesser rate coming back to this country than what it is being sent. That would be obvious public knowledge people would want to know that you think should be available, don't you?

Dr Hardy—I think you would like to know that. I would like to see that contract, but I do not have the justification that you have as the Public Works Committee. I could not go to ANSTO and say, 'Show me your contract.' They would say, 'What is your interest in it?' But you can ask them.

Mrs CROSIO—You were here yesterday when I put that very question to them.

Dr Hardy—If they are responsible to a minister and that minister decides that in his opinion he cannot release this or that or this paragraph or that paragraph, that is his decision. I really cannot comment on that.

Mrs CROSIO—You also stated in a reply to our chairman that, even when that contract was being drawn up or ANSTO were looking at what was happening in the USA as well as London, there were other options they could have pursued. What other options were you thinking of at the time?

Dr Hardy—I was thinking that you could reprocess it in this country. I think they did examine that. They did put a proposal to the government to allow them to build a reprocessing plant, and I believe they probably said how much it would cost. That is an option. The other option, which is hypothetical, is that they could have said, 'The Russians have approached us and they will reprocess it. It will cost us this much. Is that an option?' I do not know whether they did or not, but that was another alternative.

Mrs CROSIO—So that is what you were referring to in your statement. Can I take you back to the report you have submitted to us, Dr Hardy. On page 4 of that report under 'Comments on concerns expressed by local community and others' at paragraph 16, down the bottom, it says:

The ANA believes that the concerns of some persons in the local community and others have been adequately answered in the EIS and by the extensive community consultation process undertaken by ANSTO particularly over the last year.

Again, because I know you have been here in the audience for the last two days, you have seen time and time again people come forward and say they questioned the EIS because how can you do an EIS when you haven't got a model? How can you do an EIS when you haven't got a specification? How can you do an EIS that is thoroughly going to come back with the information that the community demands if all the preparation is not there and it becomes public knowledge? How has the ANA come to a conclusion that they believe that ANSTO has adequately covered for the community everything in the EIS and has had extensive community consultation?

Dr Hardy—Those are the views of the majority of our members and my personal views. I have read these voluminous documents, I have seen how much community consultation

there has been, and I believe it has been extensive. People have the opinion that it has not been enough. What is enough? We did discuss this at length in the Senate Economics References Committee. Is it adequate enough to send 50,000 letterbox drops to local citizens or should it have been 100,000? Should it have been the whole of the Sutherland Shire or should it have been the whole of Sydney? Where do you stop? A decision was obviously taken that you would do a certain amount of public consultation. I believe, looking at other things that have been up for EISs in the last 10 or 20 years in the country, that this has had more public consultation than any other thing except the third runway and the second airport.

Mrs CROSIO—Rather touchy where I live.

Dr Hardy—It is a fact of life for a number of people. Aircraft noise affects me in my home, so I am concerned about that. I have worked at ANSTO and at the previous Atomic Energy Commission for many years. I never once had the feeling that the operations were not safe. I have no allegiance to them now. I can say what I believe is the truth. They don't pay my salary. I believe what they are doing is safe by generally accepted standards. You don't have to take my word for it. The McKinnon report and other independent reviewers have said it is safe as far as they believe.

Mrs CROSIO—I agree with what you are saying in that they say they believe it is safe. But how does your organisation feel when costings have not been able to be adequately tested on what the ultimate cost is going to the public purse?

Dr Hardy—Can I comment on that? You have to realise that if you wanted a design in great detail, as asked for by many opponents, and you wanted it from more than one vendor, you would be asking each of the vendors—let's say there are four of them at the moment being pre-qualified—to spend at least \$1 million in order to produce that very detailed design. Do you think that four research reactor vendors in the world will spend that money up-front right now before they have a feeling as to whether this is going to go ahead or not? It is very unlikely. I think it is a very reasonable way to proceed, particularly after the details were explained yesterday by ANSTO as to how exactly they were going to proceed. I think it is the only way you could reasonably expect them to proceed with this reactor.

They have operated a reactor for 35 years or so. They know what it is. They know all the details of that reactor. They have put down in writing a page of specifications of what they think the new reactor will look like. I agree with the way Professor Garnett presented it yesterday, in simple terms. The people are not scientists or engineers. It really is a basic model specification which says they couldn't have a Holden car. Whether you have a Holden or a Ford or a Toyota is detail. If you have decided you have enough money to spend, say, \$30,000 on a family car and you know you can get one for \$30,000, you just choose which one. That will not allow you to buy a Mercedes at \$50,000 to \$60,000.

Mrs CROSIO—But what if the difference between the Holden and the Mercedes is health and safety?

Dr Hardy—I am glad you asked that because you heard Professor White. He is an eminent expert, and I do hope you place some credibility in his evidence. He has operated as director of one of the leading research centres at Grenoble. This is the Mercedes, if you like.

If we could buy a replica of the Grenoble reactor, the scientists and engineers in this country who want neutrons would be delighted—they would say, ‘Great’—but we cannot afford it. That is really a Mercedes model of a reactor. That is why people take their suitcase science to Grenoble, if the government will pay them, and go and use it. Professor Barry Allen would go and use it if he were given a suitcase and some money to go. We cannot afford that reactor because it is an all-singing, all-dancing, very high performance reactor. But it is not generally used for making isotopes; it is for nuclear research.

I put it to you that we really have a dual need in this country—one is nuclear research, and I believe it is justifiable, and the second is isotope production. I would be very happy to give you my views and those of the majority of our members who are experts in this field on why we need a research reactor for isotope production. I would refute outright the evidence of many witnesses in the last two days who have said research reactors are dinosaurs that are going out of fashion. That is wrong; there are new ones being built and there are plans for new ones being built by other countries. Surely all their scientists, engineers and governments are not stupid. If they could buy an alternative, they would buy an alternative.

Secondly, they have said nuclear medicine is going out of fashion or is being replaced by sophisticated X-ray computer tomography, ultrasound, infra-red—you name it—and all these wonderful techniques. They are being improved, but they will not replace, in the next two decades, bread and butter nuclear medicine. This is not just my view; it is the view of many experts. You can always find the odd nuclear doctor who will say, ‘There are new things coming along.’ You can get Professor Allen to come along and give you his opinion, which is totally different from mine and from those of the majority of my members. Nuclear medicine is not dying out, and this is not an ANSTO push situation; it is a customer pull situation.

You look at the graphs provided in those volumes of ANSTO’s reports. Look at the increase in sales of radioisotopes primarily for nuclear medicine in this country, which have gone up from, say, 100,000 patient doses a year 15 years ago to 350,000 patient doses a year. Production has gone up from about \$4 million a year back in the eighties to \$12 million a year in income this year. It is going up and ANSTO and Access Economics, whatever you may criticise their review for, say it is going to keep on going up. That is a direct revenue from this project. If you take the direct revenue minus the operating cost—ANSTO say it will be \$10 million to \$12 million to run the reactor if it is ever built—there is still a net benefit in direct value of sales. Then you have to add to this the value of all the industrial research and other things which have a multiplier effect.

You have to consider economics and costs. ANSTO have tried to spell them out but perhaps they have not got through the message that there is a big multiplier effect on the use of radioisotopes in industry. Let me give you an example. This is work that was transferred from the AAEC to CSIRO many years ago on applications in industry in mineral processing plants. You build a black box and you sell it to the mining company. They put it on a conveyor belt, the lead-zinc ores go through all the time, it measures the amount and they can optimise their processing plant to get the maximum recovery and maximum benefits.

That black box may cost \$100,000 or \$200,000 and in the centre of it there is a radioactive source, which may cost less than a thousand dollars, made at ANSTO. ANSTO's sale is only a thousand dollars but the sale of the company that made the black box is \$100,000 or \$200,000, either in this country or in export. But the mining company can save millions of dollars from that black box, which only cost a thousand dollars in radioisotope. That is called the multiplier effect.

Mrs CROSIO—To recycle the waste, we have to take it out of the first thousand dollars.

Dr Hardy—I am sure you understand it. Yes, you are very sharp—it is taken out of the first thousand dollars. But there are a lot of these one thousand dollars. Between \$10 million and \$12 million worth of radioisotopes are being made, so all the opponents concentrate on are the risks, the safety and the cost. Never once have I heard any witness say, 'What about the benefits?'

I was astonished to hear someone say today, 'South Australia has to have this waste repository for low level waste in outback South Australia, but there are no benefits to South Australia.' Are you telling me that nobody in South Australia has had a nuclear medical procedure based on radioisotopes made at ANSTO? Of course not; they are part of the 350,000 patient doses. People in South Australia benefit from this reactor, so why shouldn't they have a little waste dump out in the outback? That is my view. I think it would be perfectly safe.

I believe that the concerns of the local community are to put all this on the table and put what ANSTO believes is a reasonable proposition. You cannot fill in those details unless you are prepared to spend millions of dollars of the vendors' filling in all those details, in discussion with ANSTO, to get exactly what you want. Everybody has got the message. The vendors have got the message, I can assure you, that the budget is just about under \$300 million. If they do not produce a good, state-of-the-art design for this reactor to that basic specification, they will not get the job and a reactor will not be built.

If they all come in at \$500 million—in their stupidity—they all know they will not get the job. If they come in under \$300 million, they will all be competing with one another and ANSTO will be saying, 'Who gives us the best deal for \$300 million?' I believe that the specification that has been set down can be achieved, but with difficulty because you are asking for a very high technical qualification.

Mrs CROSIO—Could you explain a little bit of the difficulty?

Dr Hardy—This reactor will be far superior to HIFAR, no question about it: higher flux, better ability to put in isotopes and even safer, although I believe the HIFAR reactor is safe—it has been for 35 years. This, in theory, will be even safer because of the intrinsic type of design.

Mrs CROSIO—What is the difficulty you encounter in trying to keep within that budget?

Dr Hardy—ANSTO has asked, rather cleverly, for a very advanced reactor. It has to be less than 20 megawatts. Some other reactors, to produce this kind of flux, have to be much more than 20 megawatts—30 megawatts. The Indonesian reactor, which in theory should produce the same specification, should operate at 30 megawatts. It is a bigger reactor, with more power. It uses more fuel elements if you have more power. ANSTO said, ‘We cannot get anything better than HIFAR if we stick to 10 megawatts; we have to go up in power. But because it is an intrinsically better design for 1999 instead of a 1953 design, we think we can get a better technical performance from a reactor that is a little bit bigger.’

So it is 20 megawatts. They have set a number three times 10 to the 14th neutron. That is how many neutrons you get, or what power you get for the neutron physics community. If you wanted to go up by an order of three, which someone says you ought to if you want an absolute state-of-the-art facility like Grenoble, then you could not do it at a 20 megawatt power level. That is physically impossible.

Mrs CROSIO—It is not going to be large enough—is that what you are saying the difficulty is?

Dr Hardy—No, if you wanted an even better performance, comparable to Grenoble, you would probably have to go well above 20 megawatts or you would have to use highly enriched fuel, which the government has said they are not prepared to accept. This will be run with less than 20 per cent fuel.

The Germans are building a Mercedes nuclear research reactor in Munich. They have been given a bigger budget. They have been given a lot more money than \$300 million to build a state-of-the-art facility, with highly enriched uranium fuel, for advanced neutron research. One reason that reactor is more expensive than the likely cost of this is that they want very strict regulatory requirements. To put it in simple terms, they want to make sure that if a jumbo jet dropped on top of it, it would not blow up.

Mrs CROSIO—Is that wrong?

Dr Hardy—No, it is the kind of regulation that a nuclear power station has to withstand in Germany: what if an American low flying, high speed jet ran into it? Would it be safe?

Mrs CROSIO—But I dare say that we are coming back to what I originally asked you. Do you feel that, if that costing is not enough, things like health and safety would be sacrificed? You have just given me an example—

Dr Hardy—I honestly believe that we could build a good, advanced reactor for less than \$300 million. I believe the vendors know this and they will come up with a design which is safe, which is state of the art at 20 megawatts for that flux, and which they would put their name on. No vendor is going to sell us a reactor that is not going to be safe. Their name would be finished.

Mrs CROSIO—But so would half of Sutherland.

Dr Hardy—I have only got to point to the Canadians. The Canadians are building two 10-megawatt research reactors right now. ANSTO sent a team to look at them last week. Why are they building two 10-megawatt reactors? Because Canada has a commitment to nuclear medicine in its own country, and it believes it can sell molybdenum economically, particularly to America and to other countries for export.

Mrs CROSIO—More economically than South Africa?

Dr Hardy—I do not know the difference in price between buying it from South Africa and from Canada. I am not privy to the contract information. But, in the past, ANSTO has bought molybdenum from Canada, from Belgium and from South Africa when it was shut down. I have not heard the information recently presented by the witnesses here that they are buying it from South Africa on a routine basis. I believed it was only on shutdown, but I may be wrong.

So Canada sees itself as a major supplier of molybdenum to the world market. They sell a lot to America. America only produces a small amount in its own research reactors in America and it buys a lot from Canada. It is so concerned that it is considering building its own research reactor to guarantee the American public access to molybdenum. America has got powerful cyclotrons. I have not seen any evidence that American scientists, engineers and industry are prepared to put their money into advanced cyclotrons to guarantee America's supply. They still believe research reactors are the way to go. I have said in my submission that we do not believe cyclotrons and import are the way to go, and I know a little bit about cyclotrons because I was involved in the planning and the setting up on the national medical cyclotron here in Sydney. So I know a little bit about them and I have kept up with the literature.

Witnesses have, in the past in these committees, said, 'Cyclotrons are the way to go, plus imports.' I have no argument with imports. It is possible to import what we need. I have problems with cyclotrons. I do not believe they have been developed to the state at which you can buy them off the shelf, put them in Australia and guarantee they will produce technetium every day. It is dodgy, in my opinion. You would need one in every major capital if you closed down the present reactor. You are not talking about one cyclotron in Sydney. You would need one in Melbourne—Melbourne are not going to put up with it if they do not have one. Then Perth will want one and Brisbane will want one. You will end up with four or five cyclotrons producing for local supply because you cannot make enough to send it all over Australia if you make technetium, and everyone accepts that. You have to buy several cyclotrons and the little processing plants that go with them—which is not, I believe, economically or technically wise.

The alternative is a spallation source and we do not believe, from our expert members, that this is a viable way to go in terms of producing neutrons. We believe it would be an expensive option, and it does not give you the flexibility that a research reactor does. When it comes to cyclotrons, you can say, 'Let's make the molybdenum in the cyclotron and then we can ship it all over the country just as if we made it in a research reactor.' Professor Lagunas Solar has been held up as the world's leading authority on this for many years by the opponents. They said, 'He says it can be done; we should follow him.'

His latest work was published by the International Nuclear Energy Agency in a report which came out this year. I saw it a month ago. I would like to quote from this report because this is one of the world's leading experts who has been held up as a shining example by the opponents of the research reactor. They say that you can produce molybdenum-99 and then you put it into generators and send them all around the country. In this IAEA technical document 1065 of 1999, page 110, Professor Lagunas Solar, speaking about the production of molybdenum-99 in the latest cyclotrons that he has available to him, says:

However, this accelerator-based yield is too low to be competitive with reactor production of ⁹⁹Mo . . . Furthermore, the resulting specific activity—

that means the concentration of this—

would be too low and not practical for the current generation of high-specific activity fission-produced . . . generators.

So the world's leading expert says that it is not in a situation that is economic—research reactors are.

Senator CALVERT—Chair, I was going to ask Dr Hardy a question on the evidence that we have had in regard to the alternatives of using spallation, neutron sources and cyclotrons. I think he has already answered that, so I will let someone else have a go.

Mr LINDSAY—Dr Hardy, I talked to the previous witness about the secrecy of ANSTO, and I would like to raise that issue with you. The previous witness gave evidence of a couple of incidents that occurred both this year and last year. He referred to a release of iodine-131 and he claimed that about October last year there was a release of some liquid and there were some problems there. It is my understanding that, in the iodine-131 incident, one-tenth of one millilitre of that particular product escaped with no consequences whatsoever. The system knew immediately that it occurred. In relation to the release of water, it was an airconditioning team who were using normal water supply, and there was no radioactivity involved whatsoever.

The point that I make out of all of that is that, if in fact those two incidents were totally inconsequential, why is it that the system apparently cannot be more open about this? Why do we have this misinformation that circulates in our community? What should ANSTO do? Do you think they are excessively secretive? Should it be part of the process that it be more open?

Dr Hardy—I do not know the details of those particular incidents you referred to. I have only the information that has been put in the press, which is sometimes sensationalised. I have had no reason to inquire of ANSTO for the details of those incidents, so I cannot comment on the details. In general terms, I think that ANSTO is like all other government organisations and government departments. It is the culture of secrecy that is unfortunate in all government departments. I think it would be in ANSTO's interest to make more information available. I think you should ask the chief executive of ANSTO that question, not me. In the days that I worked there, there was a philosophy that everything was classified. Even memos between officers had 'Not for publication' stamped on them when there was no reason for that whatsoever.

I have just completed a history of the Australian Atomic Energy Commission which will be published very shortly, and I comment in that that there was excessive secrecy in the Australian Atomic Energy Commission. I know that, but why it is in the culture of government departments I do not know. You would have to speak to a social psychologist to explain it. Obviously, there is the mystique of 'Keep all this information within the house and you can't be criticised; only when something really goes wrong do you tell people.'

Mr LINDSAY—So you would advocate a more open approach and, if people want to know, you would tell them?

Dr Hardy—I would advocate a more open approach. If I were the chief executive, I think I would have a more open attitude and not follow the strict letter of the law. What ANSTO have done, from all that I can read and from evidence I have heard in these committees and the Senate committee, is follow the letter of the law. They are required by law to inform X, Y and Z if something happens. They have done that, and they have not felt it necessary because, in their view, there were no off-site circumstances which needed the letter of the law to be followed and for them tell the Sutherland Shire Council Mayor, Mrs Genevieve Rankin, and everybody else. That is how they find the letter of the law. I would hope that in the future there will be a more open situation. I welcome this suggestion that there should be a charter between the local people and ANSTO to get a better relationship.

But if I could refer to one incident that has been referred to today in evidence and which I was involved with, so I have some expert knowledge. It is an incident raised by one of the witnesses to a uranium hexafluoride emission many years ago from Lucas Heights. In the research laboratory, some uranium hexafluoride went out of a vent. Someone said, 'The fire brigade was called. They would not let them in. They did not have the right coverings,' and so on. There was no fire involved. Why would you call the fire brigade if there was no fire? It was not a fire situation. There was no need for firemen to go in. The workers had stabilised the situation in that laboratory. The AAEC held an internal committee of inquiry. I was the chairman of that committee of inquiry, and we did a very thorough examination. We ordered site samples to be taken. We ordered samples of vegetation to be taken outside the fence to see whether anything had escaped. We analysed everything. We wrote a report. It is not true to say this was not told to the public and it is in my book. Mr John Tingle at 2GB was informed on Friday afternoon, and he mentioned it on his radio program on the following Monday. This was in the public domain, all the necessary authorities were warned and I was involved. So I totally reject that in those days everything was kept secret. It was not. This was an occasion when there was a potential off-site incident.

Mrs CROSIO—What was actually buried in the cemetery, Dr Hardy? Does anyone know?

Dr Hardy—I think ANSTO has the record from the days of the AAEC of what was buried. I cannot remember the exact details, but I think as much as a ton of beryllium-containing material was buried. This is of more consequence, I would propose, for future concern and is radioactive.

Mrs CROSIO—Was it buried encased?

Dr Hardy—I believe it was buried in packages so many metres below the surface and covered over in almost the same way that you would bury municipal garbage in those days. It was in a fenced area, secured, no-one was allowed to go in from the public. Periodically it was monitored.

Mrs CROSIO—It did not happen during your time?

Dr Hardy—No, it happened before my time, so I do not have any first-hand knowledge.

Mrs CROSIO—No-one is professionally worrying about leaching or anything like that?

Dr Hardy—There was a fairly substantial review done of this with an independent consultant. I forget the name of the consultant, but an independent consulting company was brought in to review the evidence—the facts and figures of whether there was a risk or not—in association with the local government. I remember that the report gave it a relatively low risk, and so that was put under the shelf and forgotten about. But the report is available. I am sure that report could be made available to you by ANSTO. They must have a copy of it. I do not have a copy of it.

Mr FORREST—Much has been made of the Access Economics report. I am interested in pursuing the commercial benefit of taking advantage of that commercial benefit. I note that ANSTO have told us the value of isotope technology is expected to grow \$40 million in the next 10 years. You say \$10 million by the year 2005. They also make reference to \$150 million of export opportunity. But we have had no evidence from them that they have a proper business plan showing that they could harness access to that sort of potential, if it exists. Could you comment on that? It is fine to say that there will be a market there but, for us to get a benefit, we have to secure it.

Dr Hardy—I do not think the \$150 million that you are referring to is direct revenue. I think this has the multiplier effect in it, has it not?

Mr FORREST—I am not sure that that comes out of Access Economic's report. It has certainly been given to us by ANSTO where they say that the potential regional market for radiopharmaceuticals is expected to increase to more than \$150 million annually in the next decade. That is fine, but there will be other competitors wanting to get access to it too, particularly if it is in Asia.

Dr Hardy—I do not know how they arrived at those figures. I think you should ask ANSTO that question. If it is correct that they have sufficient customer demand to increase production fourfold, I think it is reasonable that they might achieve \$30 million a year income by 2005. I am not sure how they arrived at the figure of \$150 million but, as I said, from my experience in working with industry and using radioisotopes, there are big multiplier effects. I have also seen a detailed report produced in America a few years ago where someone did a complete study of the American systems as to input of radioactive materials at the bottom end, what multipliers produced and how many jobs were produced, and the figures were very large. Nobody has done that in Australia, as far as I am aware. I have not seen anything, but I could believe that these figures apply reasonably to the medical sector and that it will increase.

As I said before, I believe nuclear medicine will continue to increase as a procedure. I do not agree with Professor Barry Allen when he says that nuclear medicine is not a very great future benefit for cancer. I have a friend who has just been diagnosed with secondary bone cancer. Once you get a diagnosis of secondary bone cancer your prognosis for future life is very low. If that could have been diagnosed earlier, before it had become disseminated bone cancer, the patient's prognosis would be very much better. You could treat it by surgery or by chemotherapy but you have to find the primary source. In this case, it was an ovarian cancer which had spread to the bones. When it has reached that position, there is an exceedingly low chance of survival.

Nuclear medicine offers a technique today for diagnosis of secondary bone cancer. Even when you are in an advanced state and there is not much hope for you to live very long, there is a palliative method using radioisotopes which can kill the nerve endings that are giving all the pain and in the last few months of your short life you can have less pain than if you took morphine every day. This palliative or therapeutic method has been proven.

Most nuclear medicine techniques are for diagnosis. I give this graphic example, that X-ray techniques have developed enormously in the last decade and now ultrasound techniques are developing enormously. You can put a patient on a very sophisticated million-dollar X-ray camera to take a beautiful picture of that person's body and the anatomical detail is magnificent. If they have a broken bone, of course it is very important, but if it is more a functional problem that picture will be the same whether that patient is alive or dead. In fact, it would probably be a better picture if they are dead because they are not moving and you do not get any slight vibration of the heart or the lungs. But if you put that patient through procedures to see whether their kidneys are operating, their liver is functioning properly, their lungs are operating and they are using sugar properly in their brain for energy, you can only tell those with a nuclear medical diagnosis, except for one or two examples where you can use nuclear magnetic resonance, which is developing.

So I believe this is one of the reasons nuclear medicine is growing at enormous speed—and not just in Australia. I saw a report only yesterday of a study done in New Zealand which has the same pattern. Nuclear medical procedures have doubled in the last 10 years in New Zealand. They do not have a reactor; they have to import their isotopes.

I come back to my point about import. Friends of the Earth are really honest. They said to you today, 'Look, we oppose nuclear reactors, we oppose research reactors. Even if you approve it and the environmental impact is perfect, we still oppose nuclear reactors. We are not going to change our attitude.' A lot of the others feel the same way. I believe Greenpeace would prefer not to have nuclear reactors. The campaign against nuclear power and nuclear research groups would like not to have them at all. So they say, 'Let's import it.'

I do not believe that is an ethically substantiated position. What they would be saying—and you would be saying if you agree with them is, 'Research reactors are not safe, not economic in this country. Let somebody else build them and use them and get rid of the waste and we will just import the product.' This is the same as a country in Europe saying, 'We don't want any nuclear power in our country but we will import 50 per cent of our electricity from France. They will sell it to us cheaply. They are making it all by nuclear

power but that is their problem; it is not ours. We will just buy nice clean electricity.' This is the ethical dilemma: if you do not want to take the problem of handling the waste and building the reactor and properly operating it and just want to buy the product from someone else, you are saying, 'Let them have all the risks and we get all the benefits.' To me, that is not ethical.

VICE-CHAIR (Mrs Crosio)—Thank you, Dr Hardy. In the absence of our chairman, who has to get an early flight, I thank you for your patience in the last two days. I noticed you sat right through with us.

[3.07 p.m.]

SCHNELBOGL, Mr Hans-Peter, Private Citizen

VICE-CHAIR—Welcome, Mr Schnelbogl. The committee has received a submission from you dated 14 April 1999. Do you wish to make any amendments to that submission?

Mr Schnelbogl—I supplied a new copy beforehand, I do not know whether you received it.

VICE-CHAIR—Yes, we have it. It is proposed that the submission and the Australian Nuclear Science and Technology Organisation's response be received, taken as read and incorporated in the transcript of evidence. Do members have any objections? There being no objection, it is so ordered.

The documents read as follows—

VICE-CHAIR—I invite you to make a short statement in support of your submission before we proceed to questions.

Mr Schnellbogl—I would like to first come back to the issues which were raised just before. I have the feeling that there is a general misunderstanding about the quality of spent fuel. Spent fuel is about several thousand times more radioactive than the new fuel elements. That happens because, in the process of these elements being in the reactor, they create a large amount of fission and activation products. Fission products are basically the ones which have a smaller atomic number and comes from the fission of the uranium. Activation products are basically those which have a larger atomic number—like plutonium also—which come from enlargement of the uranium atom which is also created. The activation products are long lived. They have a low radioactivity but if you integrate the dose which is received from these isotopes over time they usually have a greater effect on the future health of people. The fission products are usually short lived. That means that when go over them with a Geiger counter you get a high reading. But they disappear after a few minutes, after a few years—at the most after a few hundred years.

So there are three reasons for reprocessing the fuel rods. Firstly, the spent fuel is so hot, so highly radioactive, that it would require ongoing cooling, and that could not be afforded. So reprocessing is meant to condition the spent fuel rods in such a way that they can be safely and cheaply stored afterwards as waste. Secondly, uranium and plutonium is extracted during the reprocessing, for obvious reasons—uranium for new fuel elements, plutonium for nuclear weapons. It is a bit hard to understand why Australia spent so much money on reprocessing when we could just condition the waste from a reactor. ‘Condition’ means diluting it to such an extent that it does not require any further cooling. But that is just a point on the side.

I would like to refer to the previous speaker. He said that it would be not supportable to oppose a nuclear reactor at any price. I oppose it at any price. The reason is that we have a 50-year benefit—however questionable that benefit is—from a reactor at the most, and we have nuclear waste from it for 500,000 years, for 5 million years, for 5 billion years. The half life of depleted uranium—which in terms of the integrated dosed received is probably the most important aspect of the waste—which is uranium 238, is 4.5 billion years.

So, basically, for whatever advantage we are getting from that operation—if we get any when we add it all up—we are off-loading the cost to the future generations for eternity. There is no limit to that. There is another aspect of the nuclear reactor’s operation. I do not know if anybody read that paper.

VICE-CHAIR—It is included in our documentation.

Mr Schnellbogl—It has outlined the effects of depleted uranium as ammunition. When depleted uranium ammunition hits a tank, if that is its purpose, it gets, in a very high temperature impact, pulverised to extremely fine particles. The particles are that small that they behave like an aerosol. They stay suspended in the air until the rain brings them down. So these particles will keep damaging people in the future indefinitely. There is no limit to the war in Iraq that has been started by using depleted uranium ammunition. That war can

never be switched off. Currently there is discussion about a similar approach to be used in Yugoslavia, so you will see what happens there.

To operate the reactor ANSTO requires uranium. The uranium has to be mined. That means it has to be brought out of the soil, out of the ground, from underground. Then it has to be milled to very fine particles. The main danger from the uranium ore is the alpha radiation. Alpha radiation is only a problem when it gets inside the human body. The ore, due to its location and due to its integration in the rock matrix where it was before, cannot get into the human body, or very small amounts only. Once you bring it up to the surface, once you mine it, once you mill it and once you dump it as tailings waste, this waste can get into the human body.

Eighty per cent of the original alpha radiation, which is the only important one in that regard, remains in the tailings. That has been acknowledged by the Office of the Supervising Scientist—I have a quote here. This waste stays radioactive. There are two parent isotopes in the tailings. One parent isotope has a half-life of 76,000 years. That is thorium-230. The other parent isotope is uranium-238, as I mentioned before. It has a half-life of 4.5 billion years. Initially, the understanding of the radiation watchdog for the Northern Territory, the Office of the Supervising Scientist, was that these tailings would have to be safeguarded for hundreds of thousands of years. The Australian regulations require the safeguarding of the tailings for 200 years and the tailings structures have to stand the test of time for 1,000 years. We can have leakage and escape of tailings after 200 years and it is 1,000 years for the tailings structure.

What I am about to say gives you an idea of how much you can rely on regulation. The big tailings dams in Australia, the Ranger dam and the Olympic dam at Roxby Downs, both have major leakages. At Ranger there is ongoing measurement of the ground water contamination by sulfur and uranium. There is a very big leak at Roxby Downs. It is officially acknowledged that one gigalitre—1,000 million litres—of tailings leakage is escaping into the ground water. Both these tailings dams are in breach of the 200-year time limit regulations right now. While they are in breach, ERA has applied for another mine—Jabiluka—and it has been approved. While they are in breach, Olympic dam has approval for an extension.

Let us have a look at what radiation is left after 1,000 years. It is a very simple matter of physics, it is not in any way a disputed question. It is 99 per cent. After 10,000 years it is 91.4 per cent and when you include the uranium you come to about 92 per cent or 93 per cent. I have supplied you with a 40-page paper on the long-term consequences of uranium mining. These figures are in there in greater detail.

VICE-CHAIR—I assume your reference to the uranium mining is that we need the uranium for the Lucas Heights reactor?

Mr Schnelbogl—Not only that.

VICE-CHAIR—The evidence we are taking, as you realise, is to do with Lucas Heights.

Mr Schnelbogl—The Australian government also believes that we need seats on international committees on nuclear regulations and the Australian government is certainly an interest holder of the uranium mining industry. In a way, letting that reactor go ahead means that Australia will continue to keep uranium mining going.

VICE-CHAIR—Could we please break at this stage for questions, and that will allow you to continue your explanation.

Mr LINDSAY—I had not previously heard about the depleted uranium weapon that you talked about. Do you think that is being used in Yugoslavia?

Mr Schnelbogl—As far as I know, it is not being used right now. It is under discussion.

Mr LINDSAY—Was it used in Iraq?

Mr Schnelbogl—Yes, excessively.

Mr LINDSAY—Who used it?

Mr Schnelbogl—The Americans. Any country which receives our nuclear waste for reprocessing will receive our depleted uranium and any country which supplies our fuel rods has received a large amount of depleted uranium from the production of those fuel rods.

Mr LINDSAY—I understand that. What is the effect of this weapon? You talked about firing it at a tank. Why is uranium used?

Mr Schnelbogl—Uranium is by far the heaviest mineral on the planet. When you have a bullet or a projectile which is very dense it can penetrate the tank. That means the American weapons could reach twice as far as the Iraqi weapons could reach. That is the reason the war was easily won. The Iraqis did not have time to even launch a shot.

Mr LINDSAY—Thank you.

Mr HOLLIS—Is that documented anywhere?

Mr Schnelbogl—It is common knowledge.

Mr HOLLIS—It might be common knowledge, but is it documented? Where did you get that information? Did someone tell you or did you read it?

Mr Schnelbogl—I do not know; there are so many sources.

Mr HOLLIS—You are making an assertion here and we are asking you for the proof. You say it is common knowledge. It is the first time I have heard it. For credibility it should be documented.

Mr Schnelbogl—There are a lot of American groups fighting for the recognition of Iraqi war victims. They have done extensive research and made extensive submissions and had

extensive court cases on that issue. There are claims that tens of thousands of Americans have been contaminated by that material. I read the other day on the Internet that there are regulations from the Pentagon concerning how people are to deal with that material and they are different from the regulations given to the soldiers when dealing with that material because it is a combat situation. That means the generals can tell them to do something without protective clothing even though the general regulations are completely different. I cannot give you a proper source off the top of my head.

Mr HOLLIS—Perhaps you could take the question on notice and at some time supply the committee with some reference source so we can independently verify it.

Mr Schnelbogl—Official American government information is available. Rosalie Bertell appeared recently on Australian TV and made a comment on that.

Senator CALVERT—In your paper you assert that the real reason behind this nuclear reactor is nuclear weapons. You talk about the possibility of plutonium and that the Australian government has intended to build a reprocessing facility. I thought we had evidence here today that they had ruled that out.

Mr Schnelbogl—On 29 March there was an interview on *Background Briefing* on ABC Radio and one of the persons interviewed there said that the Australian government's intention was to build a reprocessing plant, but they did not consider it realistic to go ahead with because the public would not bear it.

Senator CALVERT—Who was interviewed?

Mr Schnelbogl—It was *Background Briefing* on 29 March 1998. I do not think I said that that is the only reason for the nuclear reactor. Did I say that? I would also like to refer to the Y2K problem associated with nuclear reactors. It is generally thought that you can just switch it off or change the date. It is not that simple. If you switch a nuclear reactor off and stop the cooling, depending on the type of reactor—it varies a bit—it may then be only 40 seconds to meltdown. You cannot just switch a nuclear reactor off. The core needs to be cooled. If you switch the reactor off half a year early because you know in six months the Y2K problem may stop the electricity supply, I think it would take 10 hours to meltdown. I do not know how the current Lucas Heights reactor fits into that picture, but you may want to ask ANSTO whether they have considered that their core has to be cooled and that any backup generators for electricity may not be as reliable as they hope.

VICE-CHAIR—That question was asked of them a number of times. Their answers were that they were complying with the government regulations as far as supplying the computers. They have until July this year to have them fixed up and that is what they are working on. We also saw in our inspection there that they close it down four days in every 28 and every four years for 12 weeks.

Mr Schnelbogl—But not the cooling. The cooling would always be supplied by the power grid and on top of that there would be backup generators. If you have a serious breakdown in the power grid the backup generators may not be adequate. It is a very serious problem.

VICE-CHAIR—We will take that question up with ANSTO.

Mr Schnelbogl—I would like to raise some issues on the reference accident because I can see from your questions that my paper has probably not been read. The reference accident I describe is 400 million times more dangerous than the one described in the EIS. ANSTO has not addressed the reference accident that I proposed at all. I rang ANSTO and after several phone calls I finally got a call back and I was told that to discuss publicly my reference accident, which is a military attack on the reactor designed in such a way to release the radioactive inventory by a rocket explosion inside the reactor—I explained how that works—would only give people ideas. It does not need much brain to realise that a reactor contains an enormous amount of radioactive isotopes and it would be the biggest hit you could give a nation if you could blow it up.

In reply to my submission to this committee, ANSTO made a big point of the fact that the Iraqi reactor I mentioned, which has been blown up by the Americans, did not release any radioactive contamination. I did not claim that it released any radioactive contamination. I just used it as an example of a reactor being attacked. There are dissenting claims—some people claim it has been associated with a big release of radiation, others say it has not been. I quite clearly said in my submission that the situation is not clear.

There are reasons why it should not produce contamination. There are two allies of the Americans close by—one is Turkey, which is a NATO ally, and the other one is Israel—so it is quite sensible not to blow it up in such a way as to cause the release of the radioactive inventory. In a war involving Australia, the blowing up of the Lucas Heights reactor would affect no other country because there is no country nearby. It would be an ideal target to release radioactive inventory—it could be timed so that the wind carries the isotopes to the most populated areas and a slight rain brings them down on the people. The isotopes currently considered, like iodine-131, are rather short-lived. This list has to be expanded because there are a lot more short-lived ones in the range of one to three hours, which would still reach people. The quicker the isotopes reach the population, the greater the increase in the total amount of activity—exponentially. So it is a very serious issue and I cannot understand how anybody who works for the public does not address a 400 million times claim at all.

VICE-CHAIR—As you realise, we have ANSTO coming back. In relation to all of the evidence we have been taking over these two days, we will certainly have questions for ANSTO. It will not be this afternoon. We will have another day in which to do it.

Mr Schnelbogl—Not addressing that with a public reply but doing that in camera does not give me any opportunity to address the answers. From experience, the answers need addressing.

VICE-CHAIR—To my knowledge, we will not be questioning ANSTO in private or in camera. It will be in public. It will be on the public record, believe me. They would normally have been here this afternoon but, because we have had an overrun and, as you realise, a number of our colleagues have had to leave early, it is far better that we have them in for a full day of questioning over the evidence we have been able to gather in the last two days. At least it gives us the information that people are concerned about and gives us as a

committee the other areas to take on board—that is, papers such as yours and other evidence which has been supplied to us. Are there any other questions for Mr Schnelbogl? There being no further questions, I thank you. Please be assured that your paper and all the other papers we have that are now on the public record will certainly be questioned with ANSTO. We thank you accordingly for giving up your time and giving evidence to us here today.

Mr Schnelbogl—Thank you.

VICE-CHAIR—It is proposed that the correspondence received that has been circulated to members of the committee be incorporated into the transcript of evidence. Do members have any objections? There being no objection, it is so ordered.

The correspondence read as follows—

VICE-CHAIR—Before closing, on behalf of our chairman and our other colleagues who had to leave earlier, I would particularly like to thank the witnesses who appeared before the committee yesterday and today and those who assisted our inspections yesterday. I would also like to thank our committee members, *Hansard* and, most particularly, our secretariat. A special vote of thanks is due to the Presiding Officers of the New South Wales parliament for making this venue and other facilities available to us as a committee for the public hearing.

Resolved (on motion by **Mr Lindsay**):

That, pursuant to the power conferred by section 2(2) of the Parliamentary Papers Act 1908, this sectional committee authorises publication of the evidence given before it and submissions presented at public hearing this day.

Committee adjourned at 3.33 p.m.

