RESUMED **[11.03 AM]**

COMMISSIONER: It is 11.00 and we will reconvene and I welcome from ANSTO Mr Shaun Jenkinson. Thank you very much for joining us this morning. Counsel.

MR JACOBI: ANSTO is a public research organisation responsible for delivering specialised advice, scientific services and products. ANSTO manufacture radiopharmaceuticals through its business arm ants Health. Nuclear medicines are widely used for diagnostic imaging and increasingly as therapeutics. Mr Shaun Jenkinson joined ANSTO in 2010 and is currently the Group Executive for Nuclear Business responsible for all commercial operations including ANSTO Health, ANSTO Minerals, ANSTO NTD Silicon, ANSTO Radiation Services, Mo 99 Operations and the Business Development function. Mr Jenkinson has a degree in biotechnology and is a graduate of the Australian Institute of Company Directors. He has more than 20 years experience in the pharmaceutical industry and more recently durable medical equipment and medical devices. The Commission calls Mr Shaun Jenkinson.

COMMISSIONER: Mr Jenkinson, can I start with getting an idea of what ANSTO produces?

MR JENKINSON: Sure. In our ANSTO - - -

COMMISSIONER: In terms of - - -

MR JENKINSON: ANSTO Health business.

COMMISSIONER: Yes.

MR JENKINSON: We produce obviously radiopharmaceuticals that are used broadly for diagnosis and therapy as you've already heard. Our biggest and most important product is probably molybdenum. Molybdenum which decays to technetium and is used in about 80 per cent of all diagnostic images globally. We make molybdenum for bulk export and we make Molybdenum that goes to be used in generators and unit doses around hospitals, around 260 hospitals and pharmacies all around Australia. In addition to that, we make iodine 131, iodine 123 MIBG, 131 is usually both diagnosis and therapy, as is MIBG 123 used in therapy. We have lutetium which is a new emerging therapeutic agent which is currently going through clinical trials and we also distribute thaliums and galliums and we have a PET facility for making FDG.

So a range of radioisotopes that are used within both Australia and the global market.

COMMISSIONER: So let's talk about the customer base, if we can.

MR JENKINSON: Okay. So if you look at the Australian customer base, we have nuclear medicine facilities all over Australia and we talk about a number of around 250, 260 that are serviced through products from ANSTO and other suppliers in the marketplace. Obviously those mainly relate to diagnostic type imaging because that's the majority of it. There is a significant growth in therapy with radiopharmaceuticals at the moment and for the future. That is really where we see growth in this marketplace, so we are now engaging with commissions who are dealing not just with diagnosis through imaging but moving on to therapy. So one of the ways to look at it is if you think about the big disease areas across the world, heart disease, cancer, there's probably no family that isn't touched by those diseases and those are two of the biggest things for nuclear medicine.

COMMISSIONER: All right. Let's just talk about the value of the market. The global market? Both now and the Australian market and what you see in the future? And perhaps expand a bit on the – your previous evidence about where you see the market - - -

MR JENKINSON: Sure.

COMMISSIONER: - - - in the future?

MR JENKINSON: So it's reasonably challenging to get good global figures and you can get market reports and there is some variability between them but one thing that is consistent is the trend within those. So we say the market is in the region of around 10 billion dollars globally at the moment, US. And that's showing growth, if we look forward about five years, to go up around 17 billion dollars. So you can see there's some good growth in that marketplace over time. Even in other reports where you might see slightly lower numbers, the growth factor is much the same and both would say the same thing, it's base loaded by the spect, diagnostic imaging and there's been growth with the introduction of the PET pharmaceuticals and the PET imaging but more so as you see the introduction of new radiotherapy products and there's a figure from Bayer is a good example, that growth is being fuelled and driven by the potential for those products.

If you come back to the Australian market, again it's very much the same dynamic in terms of its nuclear imaging that is the base load for it and the technetium based imaging that is the driver of that. But PET has taken off over time and we estimate, because it's a very complex market situation, in terms of

the way it's distributed and how it's measured, somewhere in the region of 80 to 100 million is probably the – a reasonable estimate for the Australian market. You might get some challenges and variations of that but some people measure to who they supply to, as opposed to the patient, and that can shrink the size of the market because we all distribute slightly differently.

COMMISSIONER: Okay. That's the demand side. What about the supply side?

MR JENKINSON: Supply of the products and where they come from?

COMMISSIONER: Mm.

MR JENKINSON: So for the technetium-based product, the vast majority of that comes from ANSTO. We manufacture molybdenum which goes on to the technetium generators. We ship that direct to some hospitals who use that for – with the benefit of a radio chemist on site to compound up and image many different conditions. We also supply to Central Radiopharmacies who then convert that in to unit doses and supply that to hospitals. So that adds a little bit of complexity to the market and changes the value because they add a value add to it.

COMMISSIONER: Mm'hm.

MR JENKINSON: And they really operate in the major metropolitan areas because of the shorter half-life of the technetium product. The generators tend to go to more rural areas and to hospitals that want to have control of their own production (indistinct) or their own chemistry.

COMMISSIONER: Yes.

MR JENKINSON: So there is a combination in there of direct to the customer or the hospital and via a central pharmacy. And those central pharmacies, which they exist in Sydney, in Brisbane, Perth, Adelaide and in Victoria in Melbourne, they also import other radiopharmaceuticals as does ANSTO, to distribute to the marketplace. And there can be quite a complex relationship in that with those central radiopharmacies we are often a supplier, a partner, a customer and a competitor. So it's a reasonably complex structure because of the infrastructure required to transport and manage the supply chain of a radiopharmaceutical product.

COMMISSIONER: In terms of the major suppliers, I won't call them competitors but I suspect they are. What sort of facilities in general are they using? I heard in visits that we've conducted around the world, that a lot of that infrastructure is aging and - - -

MR JENKINSON: Okay.

COMMISSIONER: - - - what impact do you see that having on - - -

MR JENKINSON: Right.

COMMISSIONER: - - - the supply.

MR JENKINSON: Yes. So if we split out our manufacturing in to the reactor based products and separate that from the cyclotron-based products because some of those are smaller and has newer infrastructure and that doesn't have the challenge of the aging infrastructure that you talk about. The reactor based products dominated really by technetium from molybdenum. Essentially comes from six or seven major suppliers globally and that is derived through fission based reaction which needs a reactor and of the majority of those, they're aging and they're 50 plus years old. The youngest is the Opal reactor in Australia. We are very fortunate in Australia to have a young reactor that operates at 300 days of power every year. So we are self-sufficient for Molybdenum in Australia but if we have a long shut down for maintenance we would be required to import product. So that 80 per cent base load of imaging, the technetium, the workhorse of nuclear medicine has had some supply interruptions over the past few years. The biggest one was most notably in 2009 when the Canadian reactor went down at the same time as the Dutch reactor, so that took out around between 40 and 60 per cent of the global supply, depending on the contracts that were in place at the time.

So the other suppliers had to try and pick up the supply and that caused some global shortages. I'm pleased to say that in Australia, our customers really didn't notice that because we had Opal.

MR JACOBI: Mm'hm.

MR JENKINSON: So that local manufacturing capability produced reliability of supply to the Australian market. Now in addition to having the reactor to irradiate the initial target (indistinct) what you also need is processing capability. So you can have the newest reactor in the world but if you don't have built in processing capability then that doesn't help your supply chain. So there is quite a little bit of complexity in there to look at and ANSTO has the reactor, we also are fortunate to have current processing capability and we are just building a larger upscale facility which will triple our output and we have the finished goods capability, so we can take the molybdenum, put it on to generators in a GMP facility and ship that to customers. So we have all components of the supply chain, except the central pharmacy at ANSTO. Other parts of the world may just have a generator line, others may just have

the reactor, or they may just have processing, or two of the three. So the aging reactor usually relates to – aging infrastructure normally talks to the reactors and then if you talk about cyclotrons, people are putting cyclotrons in all the time, they're different sizes and different energies. In Australia there's – we are probably well serviced with cyclotrons that can make FDG and there's probably an oversupply to the market.

MR JACOBI: Mm'hm.

MR JENKINSON: But that's at the lower energy range. If you get up to the products like thaliums and galliums, that are also important therapeutics – sorry, diagnostics but are reducing in their use, we don't have the capability to manufacture those in Australia because we did have a 30 MEV cyclotron but that was closed in 2009. And again, that was aging infrastructure. So it will depend on which part of the market you're talking about.

COMMISSIONER: When we were in Canada, we were – we were led to understand that some of the molybdenum may well be produced by cyclotrons in to the future.

MR JENKINSON: Sure.

COMMISSIONER: But the evidence was fairly vague, I wonder if you could give us your view - - -

MR JENKINSON: Sure.

COMMISSIONER: - - - of where that currently stands?

MR JENKINSON: I think the Canadians are probably leading and have done the most work on this. They've been very focussed on having that backup capability because of the closure of the NIU.

COMMISSIONER: Yes.

MR JENKINSON: First of all, it's technically feasible, there is no doubt about it and the Canadians have done a lot of work and they're continuing to do that work. That product has to be validated because it's a production through a different route, so it must go through sort of GMP, TGA type approval process, clinical trials to ensure that it is the same product. So there's a fair bit of work to get it to market. One it's technically feasible, the volumes that you get don't compare to the volumes you get through production in fission-based production and at the same time, the cost of manufacturing is not yet proven, so it might be technically feasible but it might not be economically viable for long-term supply. At the moment, certainly my view would be the most cost effective

way of producing build molybdenum is fission product out of reactors that enables you to distribute globally. Yes, I think for the future cyclotrons provide a potentially good source of backup if there is infrastructure problems but at the moment they don't look as though they are the solution to global supply.

COMMISSIONER: It wouldn't be inexpensive to run a reactor to produce molybdenum, so - - -

MR JENKINSON: No.

COMMISSIONER: That's an interesting - - -

MR JENKINSON: I mean the Opal reactor is a multipurpose reactor.

COMMISSIONER: Mm.

MR JENKINSON: And so production of molybdenum is one of its jobs, so you'd have to differentiate that from the dedicated isotope-producing reactor and you need to look at the maths for that. Within a multipurpose reactor like Opal, we are at full cost recovery. We pay for all of the neutrons we use effectively and so we are competing at market prices and it's economically viable to do so. One of the biggest barriers to entry in these markets is the initial infrastructure. It's a massive upfront investment to build a reactor but if there's one in place and you're paying for the neutrons that are coming out of it and you're going to apportion the maintenance costs, those maths make more sense.

MR JACOBI: You spoke of ANSTO having a cyclotron but it closed. I'm just interested – what was it manufacturing using cyclotrons? I understand it still has a cyclotrons that - - -

MR JENKINSON: Yes.

MR JACOBI: - - - (indistinct) manufacture but where – how does that relativity work where the decision is made either to use a reactor or to use a cyclotron for manufacture?

MR JENKINSON: Okay. It's basically, technically what you need to do to make the product and the energy required, the size of the cyclotron. So we had a 30 muv cyclotron based in Sydney which was the national medical cyclotron, it operated for a number of years and it did both research and produced product which was sold commercially. Now that level of energy, the 30 muv has a certain amount of power and wattage and output and based on the targets you use, that can produce thalium and gallium, the longer-lived isotopes. The

smaller ones, the nines to the 18s, maybe even the 24s as well; really they're dedicated to shorter-lived isotopes such as FDG and some more exotic isotopes. So really what the difference in energy is the sort of isotope that you can produce with less impurities in it as well and the fact that they're longer lived. So it's differentiated and again, people are determining ways of making these other products on smaller cyclotrons all the time but then the cost of doing it and the different targets you might make of it are prohibitively expensive.

MR JACOBI: I think we heard in evidence this morning that in fact that cyclotron, I assume it's the same one, was manufacturing iodine as well - - -

MR JENKINSON: Yes, iodine - - -

MR JACOBI: - - - and that's - - -

MR JENKINSON: - - - 123 - - -

MR JACOBI: - - - now in fact imported.

MR JENKINSON: Yes.

MR JACOBI: And I am just interested to just get a bit of insight in to sort of the thinking about the economics of whether it would be economic to commence producing something like iodine - - -

MR JENKINSON: Sure.

MR JACOBI: - - - or something like those matters?

MR JENKINSON: So iodine and I123 in particular, I131 was produced out of a reactor, so we're talking about I123 here which is used in such things like neuroblastoma which is a particular sort of disease of early childhood. When treated well and treated early, can have very good outcomes. So it's a very important product. We did make I123 on a 30 muv; we're currently exploring the potential for making that on an 18 although that's reasonably newer technology at the moment. The economics of a 30 muv are probably getting better all the time at the moment because there are markets in south-east Asia and there are new products such as datscan which has been launched very successfully in Europe and the US which require iodine 123 to go with the kit and those are big markets. All of a sudden the 123 marketplace has opened up again and makes the business case for a 30 muv start to look more attractive again. There are certain markets such as Malaysia that use a lot of thalium, so that would base load an opportunity.

To make a business case for a 30 muv just for Australian market would be quite challenging but to then exploit the near neighbours that we have, you can make probably a reasonably good business case at the moment.

MR JACOBI: Are these nuclear medicines that would be capable of being exported from Australia - - -

MR JENKINSON: Yes.

MR JACOBI: - - - to another country? That is they have a half-life that would be sufficient to support - - -

MR JENKINSON: We import them from Canada.

MR JACOBI: Yes.

MR JENKINSON: So to get them to Thailand and to get them to Malaysia, it's a lot easier.

MR JACOBI: Right. Can I just come back, earlier you said that you spoke of the Australian market in terms of it having a value of around about 80 to 100 million dollars and I am just interested to understand in terms of broad division, I understand that the production for technetium forms a significant part of that. Is there a broad fraction that that occupies or?

MR JENKINSON: Look I think you can say if I went down to units, it's probably about 80 per cent of the units but then the technetium component is less expensive than the therapeutics.

MR JACOBI: Right.

MR JENKINSON: So it's not a unit you could translate to the dollars. So I could say 80 per cent of the unit, it's somewhat less in terms of dollars, probably near 50 or 60, that is a very broad guess estimate.

MR JACOBI: We understand that there is to be some – that there are some advantages in using PET techniques over the spect techniques - - -

MR JENKINSON: Yes.

MR JACOBI: - - - and that is (indistinct)

MR JENKINSON: In some (indistinct) medications, absolutely.

MR JACOBI: I am just interested to understand ANSTO's view is of, given

that one produces one particular isotope for spect, what it's view about the likelihood or changes in the marketplace - - -

MR JENKINSON: Sure.

MR JACOBI: - - - emerging over the - - -

MR JENKINSON: Okay. So I think if you take a broad look at the market, it's driven obviously (indistinct) I mean, reimbursement is very important for these products. There are a number of indications that are reimbursed in the PET and obviously those are the ones that get the use and are broadly used. As the evidence build, then they'd be greater indications that are reimbursed. Also what we're seeing is improvement in technologies in the SPECT cameras and SPECT CT, so the way patients are imaged.

And there are new technetium products coming along as well. So the death of technetium isn't here yet. There's growth in that marketplace while there's also growth in PET. The cost of a dose - now, that varies quite widely but if you roughly say, for a technetium dose, you could be paying in the region of 60 or $70 for a dose, for a PET it's probably 250 to 300 for a dose, and again, they vary because you have different size doses. So there's quite a broad area, but it's more expensive at the moment to use PET than it is to use technetium-based SPECT imaging.

And what we're also seeing is that - you look at the demographic of Australia and that Baby Boomer population coming through and that aging. We're now all living to an age where we are getting more cancers. So as a result of that, both SPECT and PET are very important. I think that both will have growth in the future. We will certainly see the growth of SPECT in the Asian markets because they haven't got as much SPECT going on, but in Australia PET, I think, is doing well and has grown. It's quite flat at the moment. We will see it grow again with further reimbursement, and SPECT will continue to grow as well.

MR JACOBI: I think you expressed a view that it was almost a factor of two in terms of growth over the next five years in the global market. Is that something you expect to see in the Australian market as well?

MR JENKINSON: I think the growth has the potential to do the same in the Australian market. What will determine that is our reimbursement methodology. These products are paid for within the cost of the overall treatment. So they don't pay for the pharmaceuticals separately. So they're part of the hospital costs and the NBS system. So to get things reimbursed takes a lot longer than on the PBS for pharmaceuticals. So that will drive the rate of growth. However, there is no doubt a need and a demand for the new

therapeutics and that we will see growth; lutetium is a good example. There's a lot of clinical evidence going on.

I'm going to be honest. We're really fortunate in Australia. Many of our key commissions are actually global leaders, and so these guys are driving the development of these new products and they fully expect to be able to use them and at the moment their use will be under special access schemes that the TJ allows as we go through trial work, but we've really got to get to reimbursement to allow them to be used to their full benefit, and when you've got such expertise in the country, you should expect to see that benefit come through.

MR JACOBI: I think you've spoken of lutetium as a prospective new nuclear medicine. I'm interested to understand whether you think that there are other new prospective medicines on the horizon that you're looking at in terms of the potential for production.

MR JENKINSON: Sure. Look, I think there are new prospects all the time. In terms of full production, I think some of those are a little early to say right now. We can probably provide you (indistinct) maybe you'll notice a list, because there are some that will come through quicker than others, but what it is is there are many under review and we have to wait and see how they perform before we back a winner. And then once you do that, you've got to look at the manufacturing process and they are quite specific. So for us to invest in facilities for lutetium was around 4 and a half to $5 million. So you don't make that investment unless you know the product is going to be working. So, yes, there are some coming. I'm very happy to provide you a list separately if it helps.

MR JACOBI: What has been suggested in some submissions I think the Commission has received, there would be a trend towards cyclotrons. That's a suggestion that's been advanced, and I'm interested to understand the extent to which that's been analysed internationally and what those studies have told us about the relevance or otherwise of reactors and cyclotrons being potentially complimentary.

MR JENKINSON: Okay. I don't know if there's been any specific global allowances. I mean, we certainly have a view. Cyclotrons have the ability to produce a number of novel and boutique-type radiopharmaceuticals and they will certainly be in those shorter-lived products. So you need to have a number of cyclotrons because you have to live relatively close to them.

MR JACOBI: I particularly had in mind molybdenum and for its production.

MR JENKINSON: So you can produce molybdenum or technetium from a

cyclotron technically, but again, you'll need a lot of them to produce the amount you need for global supply, and again, it comes back to a comment I made earlier, which is while that's technically feasible, is it economically viable to do so, because of the starter material, the cost of production, compared to what is at the moment the gold standard, which is the reactor-based product.

MR JACOBI: You spoke before ANSTO having a complete supply chain, that is, an ability to both package and logistical arrangements to transport its products.

MR JENKINSON: Sure.

MR JACOBI: I'm interested to understand whether you're of the view that there's a complementarity between the state cyclotrons that you've spoken about and the activities that ANSTO is conducting with respect to the use, for example, of those supply chains or its expertise.

MR JENKINSON: So ANSTO is connected with pretty much every cyclotron in Australia. We formed a cyclotron user group because we think it's important to try and leverage the knowledge and capability, and also to take benefit from the fact that while there's different manufacturers of cyclotrons, you can't always afford to have all the different technicians over here. We need to support each other. I also believe that depending on if it was a 30 MeV cyclotron and it was based in Adelaide, for instance, or South Australia, we'd want to work very closely with that from ANSTO to make sure that the supply chain support was in place to help distribute the products, because it's not easy to distribute radioactive products, and there's a great example of Bayer bringing Xofigo to the market. They were doing very well in other parts of the world, and ANSTO will distribute the product over here because we have the capability of distributing whole products now we've got the infrastructure, we've got shielding, we know how to manage it, and so that’s very important.

COMMISSIONER: Can I stop you there? It's important we understand how this is going to be developed and manufactured in the future. Can you just walk us through the new development from when molybdenum is produced and how it's managed through this new facility to where it's logistically then delivered?

MR JENKINSON: The whole process is very easy. So we get target plates which are uranium-based target plates, and that in itself is a supply chain that involves getting uranium from the US, getting permits and licences to ship them to our manufacturer either in Argentina or France. You need certain containers to transport them in, certain licences. Once they've been manufactured, then those target plates are transported to ANSTO.

COMMISSIONER: They're irradiated with - - -

MR JENKINSON: They are just uranium target plates before they go into the reactor for a irradiation, but because of the fact they contain uranium, there's a whole bunch of regulations around understanding what's in there, tracking them, knowing where they are, et cetera. So there's a complexity to the target plates before you even start irradiating. The target plates go into the reactor. They're irradiated for between 10 and 14 days. At the end of 10 to 14 days these are now a hot product. Some of the fission product is now molybdenum. What we have to do is extract it from those target plates, which we do in a processing facility.

So we move that from the OPAL reactor to a processing facility in a shielded flask which weighs around seven tonnes. So you're not just popping in a pot and moving this around. We've a particular truck that transports it around site, and obviously that's done under a licence because it's radioactive material you're moving around. This goes into a highly shielded environment which we call hot cells, which are effectively lead-shielded work areas with manipulators that are remote handling devices. It's about an 18-hour process to extract the molybdenum, purify it, and then we get around 60 mils. That 60 mils of product is highly active, so again, it has to be shielded and is moved into our finished goods facility and that's moved around in another flask which weighs around 1.2 tonnes.

So you're dealing with heavy infrastructure here and a controlled process. That 60 mils of product, if it didn't decay, would be more than enough activity to do all the imaging for Australia for one week. You only need a tiny amount. But it does decay. So the moment you've made it you start to lose about 20% every day. So we move that up to our finished goods facility and we dispense that onto generators which are the bulk supply products that go into hospitals. Those are lead shielded. They weigh around 23 kilograms and we dispense tiny amounts onto those generators and then they go to hospitals through distribution.

We use the Dangerous Goods and we move them to hospitals. They can be transported around the country in wide-bodied aircraft. They have a measurement which is called a Transport Index. We have to make sure they fit within that. And once they get to the hospitals, they put it in large lead-shielded areas and the technicians in the hospital will effectively milk them every day to get the activity off, combine them with cold kits and use them for imaging. If we are shipping it overseas, then rather than put it on the generator, we put it into a small pot and that goes into another container which weighs 130 kilograms. We take a certain amount of activity and ship that off to the US or Japan, again in a wide-bodied aircraft.

So everything is heavy engineering, cranes; it needs a lot of lifting. So by the time we get to a patient dose - and we do patient doses at ANSTO as well for iodine - it's in a small capsule and is in a 5 kilogram lead pot and that gets packaged and sent to a hospital, and again, there's rules and regulations about how you transport these products. So it's a sophisticated supply chain. We have a good understanding of it. A lot of people in this industry do because you have to know what you're doing, and that's why someone like Bayer who's a pharmaceutical company with fantastic experience in pharmaceuticals but are new to radioactive products, when they want to distribute the product in Australia they come and see ANSTO because we can help them do it or do it for them, and that would be the same as anyone moving product in Australia.

COMMISSIONER: Just thinking about that Bayer product, is it just the distribution that you're managing, none of the production?

MR JENKINSON: They are irradiating the product in Scandinavia. They have a production facility. It is a longer-lived isotope, so they can produce it and ship it to Australia, and then that can go (indistinct) similarly, there's a very good therapeutic developed in Australia called Zyrtec which uses Yttrium-90, another therapeutic product. We used to manufacture that here for distribution all over the world. They've now built facilities in Singapore and the US which are their big markets. But we were able to do that because it's a longer-lived isotope, but we knew how to manufacture it and ship it.

COMMISSIONER: Can I just talk a little bit more about the world supply? You mentioned aging reactors. I'm assuming that the producers get together on a reasonably regular basis to talk about world supply since it is such an important subject.

MR JENKINSON: Yes.

COMMISSIONER: So do you have a view about where some of those aging facilities are going to close and is there an appetite to invest in new facilities to produce these?

MR JENKINSON: A really good question. We do meet. The OECD has a high-level group on radioisotope supply, particularly molybdenum because it's the most important one, and all of the reactor operators - and remember that that's only part of the supply chain - coordinate their reactor shutdowns in a way to try and avoid situations of outage. However, there are sometimes unplanned outages and those can cause challenges. We're also aware of when some of these other reactors - and the Osiris reactor in France will shut this December, and a number of the other reactors are due to close in the next three to five years.

Many business cases and proposals are being put up to look at alternate supplies. At the moment, as we look forward in the next 15 to 20 years, the supply can be very stable, because the other part of it was processing capability. While we had a very nice new reactor in Australia, we could probably only produce around 5 per cent of the global supply, because our processing was a constraint. With our new capability, we're going to go up three to four times bigger than we were. We'll get near 20 per cent of the global market.

We formed an alliance with the South Africans. They're about 20 per cent. Some colleagues in Belgium have applied for in Greece capacity they'll get. So there's capacity growing to cover the (indistinct) but there is still some uncertainty around some of the other - - -

COMMISSIONER: The price.

MR JENKINSON: So what's really important is if we don't manage stable supply of this important isotope, it could have an impact on a very important part of medicine, which is nuclear medicine. Now, that might drive people to other modalities, but what it could do is cause a shortage of a very critical isotope. So ANSTO and Australia at the moment are playing an important role in trying to ensure that supply, and we want to make sure that for the next 15 to 20 years technetium is a really robust supply.

COMMISSIONER: I think that was very instructive. Thank you very much for preparing the evidence and also coming across from Sydney. It's an important topic to think for the future, and it's been very helpful to clarify some of the issues for us as we think about this as an opportunity for the future.

MR JENKINSON: Okay. You're welcome.

COMMISSIONER: Thanks very much.

MR JENKINSON: Thank you.

COMMISSIONER: We'll adjourn.

ADJOURNED **[11.34 am]**