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[1.10 pm]

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COMMISSIONER: 1300. We will reconvene on the subject of security and non-proliferation risks, and we certainly welcome Dr Rob Floyd, the director general of the Australian Safeguards and Non-Proliferation Office. Thank you for joining us, Dr Floyd.

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DR FLOYD: Thank you, Commissioner.

COMMISSIONER: Counsel.

45 MR JACOBI: ASNO is the commonwealth authority responsible for

maintaining Australia's commitments under the Nuclear Non-Proliferation Treaty, the NPT, its safeguards agreement with the International Atomic Energy Agency and the Convention on the Physical Protection of Nuclear Material and Australia's other bilateral safeguards agreements. The director
5 general of ASNO undertakes the statutory functions of the Director of Safeguards, the director of the Chemical Weapons Convention Office, and the director of the Australian Comprehensive Test Ban Office. Dr Floyd was appointed to this position in 2010.

10 Previously, Dr Floyd has held a number of senior positions with the Department of the Prime Minister and Cabinet where he provided advice to the prime minister on policy issues, including counter-terrorism, national security and counter-proliferation. Dr Floyd was also appointed to the IAEA's Standing
15 Advisory Group on Safeguards Implementation, and the Commission calls Dr Robert Floyd.

COMMISSIONER: Dr Floyd, can I start? If we were to contemplate the sorts of fuel cycle activities that are part of our terms of reference, what would be
20 the implication for Australia's international non-proliferation policies upon us?

DR FLOYD: Yes. Australia clearly is involved in the nuclear fuel cycle already with uranium mining, but we don't really take it much further than that. We have a research reactor, and we've set up the regulatory infrastructure within Australia to manage the risks that reside around proliferation, security,
25 safety, environment. In my office, and my statutory responsibilities, it's about managing the risk of proliferation and security. If we, in Australia, took decisions to extend our nuclear fuel cycle footprint, then my office would have to look at how we manage the safeguards, that is, the measures to stop proliferation, and the security issues.

30 One of the biggest implications, I don't think our broad policy on non-proliferation would change. Our policy is that we take a very high standard when it comes to non-proliferation. We are very active internationally in putting in place the international architecture, working on conventions that
35 counter weapons of mass destruction, et cetera. None of that would change.

What would happen is a lot would be expected of us. It is because we have a high and a strong reputation on non-proliferation issues that if we were to develop other elements of the fuel cycle, we would need to be consistent with
40 our policy to demonstrate best practice, best international practice, within Australia as an example to other countries, and consistent with our general policy approach to maintain our openness and transparency as far as we can, that no other country would have a doubt about whether Australia has changed its idea and is thinking of proliferating. Of course we would not.

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COMMISSIONER: Evidence that we got this morning tended to suggest that nations with good track records such as Australia's are treated no differently than anyone else and that because of that, we can't trust that as a premise for moving forward. How is Australia seen in terms of its NPT credentials?

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DR FLOYD: Australia is viewed upon very positively with regard to its NPT credentials, with regard to how we implement safeguards, and one of the reason why we're viewed positively - and this is not just blowing our own trumpet - is that we go beyond what we are legally required to do to build confidence - in my space, and I won't speak for others, but in my space - in the way that we put safeguards into place and in the way that were put security into place, is that we go beyond what we're required to do and we also step beyond so that we can be open and transparent and be able to demonstrate to others so they can have confidence that we are complying with our commitments.

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COMMISSIONER: Would you expect us to be treated differently because of that track record and perhaps trusted in a different manner than other state actors?

20 DR FLOYD: Ultimately, it all boils down to trust, and in my space we often talk about "trust but verify", but it boils down to trust. There are things that states - and when I say "states", I'm generally referring to a country rather than the great state of South Australia. There are things that states can do build trust and there are things that states can do that cause trust to be eroded or not to be built. In Australia's case, I think we have a high level of trust from other countries about our non-proliferation stand and credentials. It is no secret that there was a time many decades ago that Australia looked at should they develop nuclear weapons, but I think it would be very difficult to find people who would then say, "I still have doubts as to whether Australia did give up that idea," and are pursuing this, because the international community trust us because we go the extra mile when it comes to these issues.

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COMMISSIONER: Are there any nations, in your view, that would be seen as examples of this particular activity that the Commission might learn from?

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DR FLOYD: Yes. There's a very good example, and I was visiting there just recently and I was talking to my Japanese colleagues and I said to them, "Those with much," as in, nuclear material and technologies and capability, "much is expected," and they have nuclear technology, which is entirely civilian in its use. They have 40, 50 reactors, not all of them operating. They have enrichment capability; they have reprocessing capacity; they have a large stockpile of spent fuel. So they have much, and much is expected of them in terms of building the confidence of other countries that they are entirely focusing on civilian activities.

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5 So Japan has put a huge effort into that, and the IAEA has put a huge effort into that. The IAEA has established a regional office in Japan. The IAEA has been working very closely with the Japanese regulators and entities to look at how would they safeguard Rokkasho this large reprocessing plant that they're developing, and Japan has taken a similar position to the one that we take, is that they will not be limited just by what is legally required, but they're looking to see that they can actually convince the rest of the world of their credentials, which are entirely civilian in orientation. So it's a good example.

10 COMMISSIONER: So they're a good international role model.

15 DR FLOYD: It's a very good example of a large nuclear footprint and they get it. They take it very seriously that they need to build confidence in the rest of the world to have the permission, in a social sense, to be able to do the things that they do. Yes.

20 COMMISSIONER: All right. Can I move now into the specific rather than the general, and we're now contemplating the activities that are part of our terms of reference.

DR FLOYD: Yes.

25 COMMISSIONER: So which particular activities within the fuel cycle, enrichment, fuel fabrication, nuclear power generation, storage - where do the major NPT concerns arise?

30 DR FLOYD: The major proliferation concerns arise around areas where it can directly support the possible development of nuclear weapons. So the key issue there is about the material that would be required for a nuclear weapon. There are two sorts of materials that could be used for a nuclear weapon. You could either have separated plutonium or you can have highly enriched uranium. So anywhere where those materials reside in the fuel cycle is of high proliferation sensitivity. So attached to that is where there is specific technology and no how required to develop those materials, then those technologies are of high proliferation sensitivity. So to unpack that, if you want to have highly enriched uranium and weapons grade that could be used in a weapon, you will need to have enrichment capability. So if a country develops enrichment capability for civilian purposes, that is actually a proliferation sensitive technology and a part in the fuel chain and therefore there will be high focus by the International Atomic Energy Agency, by other countries on safeguarding that.

45 The second stage in the fuel cycle where the technology matters is that when you have spent fuel from a nuclear reactor there is plutonium contained within that spent fuel. If you are to separate that plutonium, that separated plutonium

can be used for a weapon and you do that through the process of reprocessing. So the technology and the facilities that can reprocess spent fuel to separate plutonium is a highly sensitive part of the fuel chain from a proliferation point of view. The third area, I would mention, is any repository and storage where you have a lot of material that could be directly used and so if you had a large repository of spent fuel that contained plutonium then that amount of material becomes of interest; but only can it be used if there is a reprocessing capability. Now the International Atomic Energy Agency would look very closely to see if there is any indication of clandestine undeclared reprocessing capabilities, if you had this large amount of material. So the two stages of most significance is enrichment and reprocessing but it's the material that matters. If you have highly enriched uranium anywhere or plutonium anywhere then it's of key interest.

15 COMMISSIONER: So the activity of generating power from nuclear power plants is in itself not a proliferation – a major proliferation concern?

DR FLOYD: I'm glad you raise that. I listened to the evidence of Professor Sokolski this morning and I agree with him, that in some cases people underestimate the importance of power generation from a proliferation point of view. Some say it's of no significance. He said it was of some significance because if you don't have spent fuel, then what is your reprocessing actually going to reprocess? I think he's absolutely right. So it is important that we look at this as a whole system but that doesn't make a light water reactor operated in normal methods for power generation, efficient methods, of as much proliferation sensitivity as a reprocessing plant or enrichment plant. It just means that yes, you do have spent fuel; that if you had a reprocessing capability you could use that fuel. So it's not of zero proliferation concern to have light water reactors but it is certainly not the highest concern.

COMMISSIONER: Okay. If we now look at uranium exports, at the other end of the scale, I am interested to understand what Australia does to ensure that those exports are used for peaceful purposes?

DR FLOYD: The main thing we do and it takes a large amount of the effort of my office, is to establish firstly treaty level commitments and arrangements with any country that is to receive Australian uranium and any material that is derived from that, we call it Australian obligated nuclear material. We negotiate those treaties and we seek and we get a treaty level commitment by a country that it will only be used for peaceful purposes. We establish arrangements to ensure that any facilities that our material would go in to, are under the International Atomic Energy Agency safeguards measures. That means they will be subject to IAEA inspection and the IAEA concludes their conclusions about peaceful use of those facilities and non-diversion of that

material. But we also get other assurances in these agreements. We get assurances on security that our material will be secured to the standards recommendations that come out of the International Atomic Energy Agency based on some international conventions on the security side of things.

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We put in place arrangements around the provision of consent for enrichment. If any of the Australian material is to be enriched above 20 per cent, then there is a consent required from us, as to whether that is to happen, or if reprocessing is to occur, or if that material is to be transferred to a third party, another country. Our material can only be transferred to another country if we have a bilateral treaty level agreement, a nuclear cooperation agreement with that other country. So there is this network of legally binding arrangements. There then is reporting on tracking and the disposition where and how much our material is spread across their nuclear fuel cycle which comes back to my office and we examine that carefully. We have in many cases, annual meetings with those countries where we discuss any issues that arise out of the information that is provided to us. And then my office is required by legislation to produce an annual report, where I need to conclude as to whether our material is fully accounted for and we are in compliance with our commitments.

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COMMISSIONER: So you are working on data provided by the IAEA?

DR FLOYD: Not directly. The data that is provided to the IAEA by a state is confidential, the data that I work on is the data provided by the country to my office.

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COMMISSIONER: So we are relying upon the country to report?

DR FLOYD: We are relying on the country to report and there are the legal obligations in the treaty and the administrative arrangement which goes in to more of the technical details of how this reporting is to be done. And we are relying on the conclusions that the IAEA draws from their inspections and the reporting requirements from the state to the IAEA. So it's the marrying up of these two and any other information that would be drawn. Now the IAEA's efforts and activities are not limited to the accounting of nuclear material but that is an important part of their safeguards activity.

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COMMISSIONER: And that is the recently concluded – same arrangements for the sale of uranium to India from Australia?

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DR FLOYD: All of our policy is consistent. The way that our policy is implemented may vary from state to state and the way that it's described and implemented in the case of India – and India is a – it's a different circumstance where it is a state that is not an MPT party, so it doesn't have the normal kind

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of safeguard's agreement with the agency but it has a specific one. Some would say their specific safeguards arrangement with the agency is tougher in some ways than those that other states have on. There is elements that go either way. So within the uniqueness of the Indian context that we now have in place the legal arrangements which ensure that our policy can be met.

COMMISSIONER: I know counsel is champing at the bit here, so before I let him loose - - -

10 DR FLOYD: I'm not sure I'm happy about this but - - -

COMMISSIONER: It was also put to us this morning that in relation to the sale of uranium, when you embark upon that, because of the commercial nature of the activity, that you sometimes sell your uranium to states that don't have a strong MPT pedigree and it was put to us that that's a very good reason not to be in the business. I guess my question to you is in those relationships that are established with Australia and the people that we supply uranium with, how much work is conducted to ensure the credentials of the country that we sell uranium to?

20 DR FLOYD: I'll give you a little insight as to what my office has to do. We will get, from time to time, different countries approaching my office and saying, "We would like to buy Australian uranium," and they don't have a bilateral treaty arrangement with us. The first step that I have to take if I'm going to pursue that is that I've actually got to get a negotiating mandate from the Cabinet. So we have to write a submission to the Cabinet laying out the case, and then the Cabinet makes a decision as to whether we will actually commence negotiations with a country. It's the Cabinet that then looks at all of the balancing factors of the considerations as to whether we should or should not enter such an arrangement with a country.

25 So it's taken very, very seriously at the point of even starting a negotiation. It's certainly not a business development thought from my office as to where we should go. It is a very considered decision of the Cabinet, and they will weigh many different aspects, security aspects and economic opportunity, bilateral relationship, many different aspects in the consideration of giving me a mandate to negotiate or not.

30 MR JACOBI: I want to come back to the Australian-obligated nuclear material. In the submissions that the Commission has received, there have been some criticisms made with respect to the extent of inspections made at facilities at which Australian material is either handled or processed. I'm interested in your view as to the extent of the inspection obligation at those facilities.

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DR FLOYD: Thank you, counsel. Earlier I mentioned that Australian-obligated nuclear material can only go to facilities that are permitted by our arrangements and that those are subject to IAEA safeguards. In the case of IAEA safeguards in non-nuclear weapon states, then all of those facilities
5 are going to be inspected at some point or other by the IAEA. It's important to point out that in the case of nuclear weapon states, the intensity of safeguards inspections is way lower. It doesn't bear sense that they should be putting a huge amount of effort into that where they have a weapons program, they're allowed to have a weapons program where they have a civilian program, but
10 every facility where Australian-obligated nuclear material can go can be subject to IEA inspections and certainly these are under IEA safeguards.

MR JACOBI: I want to deal with - it was raised in the discussion morning - the ability for a country to communicate to other countries its desire to not
15 proliferate. I'm interested to understand, first of all, perhaps by some examples, how you can take unilateral steps that are beyond the IEA standards to communicate that matter.

DR FLOYD: Yes. I certainly see that if Australia was to take a decision to extend elements of the nuclear fuel cycle that we would want to take a strong
20 position of convincing other countries that we are doing this for entirely peaceful reasons, and the strongest way, as I mentioned before, is to go beyond your legal requirements. Part of that could be to internationalise key elements which could be sensitive, such as enrichment or reprocessing, and things were
25 decided, and so that means that you not only have the IAEA's eyes on a facility, you have the statutory officer responsible for these matters in the country watching the facility, but you then would have a board or some kind of management structure with multiple countries represented on it, and those countries are very keen to make sure that proliferation is not occurring, and so
30 they would be on it.

Now, nowhere does it say that you must internationalise sensitive elements of the fuel - well, actually in the Nuclear Suppliers Group guidelines it does make that link, but not in the NPT. So internationalising it, I think, it would be
35 certainly seen as something going beyond. We go beyond already with the information we provide on our uranium exports. We provide more information than what is absolutely required. We go beyond already in our level of transparency on some of the reports and findings from the IAEA. You can find them on our website or in my annual report. We put a lot of information in that
40 annual report than what many other countries do.

We are committed to transparency where we can. Now there are some limits, but - yes, so these are all the areas where we go beyond what is the legal
45 requirement. We don't say, "Well, I don't have to do that. I will not." We look at, "Well, I could do that. Why not?"

COMMISSIONER: Can I just pick up - because it reminded me of some more evidence this morning on the internationalisation of enrichment. It was put to us that that's a bit of a guise; it's not been very successful in preventing the disclosure of technology, and there were some notable examples given. What's your view on the ability of the internationalisation of some of that front-end activity to convince states about the bona fides of the people wanting to engage in that activity?

DR FLOYD: Right. Let me take the guise issue first. I know this is a point that various people who argue against nuclear energy use, and let me be clear. I am neither a proponent for nuclear energy or against it. I am responsible to manage some risks. That's my role, so I'm seeking to give this in a perfectly even-handed way. But some would say that a state that develops a civil nuclear energy industry would do it as a guise, as a cover, for developing a weapons capability, and they state this as though the evidence would bear that out. Well, let's have a look at that just for one moment.

There are 30 something states that have nuclear power plants, or 35 or so that have got nuclear energy elements in their jurisdiction. But then, if the concern is that if you have civil nuclear then you are on your way to having a nuclear weapon, then how many of those 30 somethings, let's say the 35, have got nuclear weapons? Well, of them there are the five nuclear weapon states. Now, they're the ones under the NPT that are allowed to have nuclear weapons, although moving towards disarmament. There are another two or three that have not joined the NPT and have developed nuclear weapons. So they not broken their commitments; they never actually made the commitments, but they're within that group. So we can take eight out of that.

So how many others? We're down to 27 or so states. So how many others, out of the 27 that have got a civil nuclear fuel cycle, have developed nuclear weapons, apart from those that were allowed to have nuclear weapons? And at that point, the number becomes rather small as we end up with the DPRK, with North Korea. In the case of North Korea, it is interesting it was the safeguards activities that picked up issues that were going wrong there, and we know where that's ended up. We have Iran where there are significant non-compliance findings that have been found. We have a couple of other states where there was some minor non-compliance, but that has been corrected and fixed. And then we have four states that had nuclear weapons, but have now given them up, and three of those are previous Soviet Union states, and South Africa.

So when we look at the number of countries that have a civil nuclear programme and people say that's only a precursor for having a weapons programme, I suggest to you Commissioner that the evidence doesn't actually

support that conclusion. It is a very small number of states that would go that direction.

5 COMMISSIONER: I think the evidence was presented in relation to convincing the international community that a multinational organisation running enrichment for instance - - -

DR FLOYD: Yes.

10 COMMISSIONER: - - - wouldn't be a convincing argument to justify a view about the safety of that particular activity because of what has happened in the past, in that these international organisations have let information – have let technology slip and nations have developed nuclear weapons because of that.

15 DR FLOYD: Yes, the example that was given, there was as an example about URENCO - - -

COMMISSIONER: Yes.

20 DR FLOYD: - - - that was from a long way back where that actually occurred. I am not saying that as an excuse - - -

COMMISSIONER: Right.

25 DR FLOYD: - - - but that particular instance did occur a long way back and we learn from those experiences. I think that it is very clear that to have an internationalised enrichment or reprocessing capability is going to give more protection than not having it, absolutely for sure. It is – I think the convincing argument is to be welcoming this other participation in and therefore the exposure which comes with that. Now we would have to have other participation anyway - - -

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COMMISSIONER: Yes.

35 DR FLOYD: - - - because we need to source the technology from somewhere. If we are to do that, there is also the need to put in place various bilateral agreements beyond what we have at the moment to enable that and there would be all kinds of constraints that would come with that as well. And any internationalised body would then sit over that arrangement in some ways as well. There would be elements of that that you dovetail in to it. Although nothing is perfect and nothing can eliminate risk entirely, I think that is a utopian view, if we can reduce risk to zero, then I think internationalising the most sensitive portions of the fuel cycle is certainly a very positive step towards reducing that risk substantially.

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COMMISSIONER: And that develops international credibility?

DR FLOYD: Absolutely it does. If Australia was to choose to embark, let's
say upon enrichment and we chose not to have any internationalised type
5 arrangement but we would have some special arrangements to get the
technology but not let them be part of it, and we didn't really have a
compelling case of domestic need or maybe even international demand for the
products of enrichment, then if I saw another state around the world with those
characteristics, I would have significant questions. And so countries would
10 have to have that about us. If that was the way, if Australia chose to go
enrichment we were to set it up, then my job will be a lot harder in convincing
the rest of the world of our bona fides are entirely civil.

MR JACOBI: I just want to pick up on something else that was discussed this
15 morning and that is that to the extent to which countries that have sought to
pursue a nuclear power programme, have disclaimed participation in other
parts of the fuel cycle. And I think the particular - - -

DR FLOYD: UAE.

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MR JACOBI: - - - discussion was United Arab Emirates and I am just
interested to understand your view with respect to the significance of such a
model to offering assurance to other countries that your power programme was
indeed directed for entirely peaceful purposes.

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DR FLOYD: Yes. The UAE, I think is a very good example of a country
choosing to go beyond what they have to do. And the UAE saw a need, their
own assessment that they needed to have nuclear power. They then took – and
this was their sovereign decision, they then took a decision and reflecting on
30 the part of the world that they actually reside in, that if they wanted to be
successful at this, they need to choose the best practice path and they need to
reduce risks and perceptions of risks as much as possible. They sovereignly
chose to then forswear enrichment and reprocessing in their territory. That was
the decision of the government of the United Arab Emirates and that was their
35 policy and the way they chose to go forward. I think that was a very wise
decision, a very good decision. That decision is reflected in various bilateral
nuclear cooperation agreements with the UAE, including our own. It reflects
that. Yes, as Professor Sokolski this morning mentioned, there is a clause in
there about relativity with other countries but the intent of the UAE is clearly to
40 build confidence and they have done that by forswearing those elements of
their fuel cycle.

They could see that they did not need those elements on their land and by
having it; it would create many stumbling blocks for them to be able to actually
45 get the nuclear electricity generation capacity which was their prime objective.

The international community look on that decision and how they have gone about it and many of us actually admire the decision policy framework that sits behind that in the case of the UAE.

5 MR JACOBI: Could I come to deal with – and perhaps to come back to the tracking of nuclear material as it travels around the world and the accounting systems associated with it. I think we heard this morning but we have also received in submissions that there are criticisms of both statistical certainty that we have about measuring amounts of material but also that there are, I think
10 it's expressed in these terms, accounting discrepancies which are said to be commonplace which inevitably cause difficulty. And I am just interested to understand your view with respect to whether those issues can be overcome and the extent to which I think it was described that there was material which could not be accounted for.

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DR FLOYD: Yes.

MR JACOBI: Represents a particular problem within the system?

20 DR FLOYD: Yes. I'm absolutely delighted that you have raised this question. There is a technical term in the nuclear material accounting world limited to three letters, MUF, which stands for material unaccounted for. And that is the issue of the discrepancy that was being spoken about. Let me just illustrate what – where MUF comes in to play. It's not things that have been lost or
25 forgotten about, or hiding in some nook or cranny that couldn't be accounted for. That is not what material unaccounted for refers to. What it refers to is often a statistical issue, is that let's say for reprocessing you have spent fuel that comes out from a power plant and that spent fuel contains some plutonium but it's actually not feasible to measure exactly how much plutonium is in the
30 spent fuel. So you could do it at some highly developed research laboratory et cetera but in an industrial context it's not feasible to do that sort of thing. So you actually model and you estimate how much plutonium is in that by the burn up rate, the characteristics of how the reactor is being used, the material that went in et cetera. So you have a number X of how much plutonium is
35 there.

When you then move in to the reprocessing system, there is this wonderful thing called an accountability tank and I think everybody should have one of those. And that is where the material is dissolved and when it's dissolved, then
40 they take samples in the tank and because the concentration could vary at different places in the tank et cetera then there is a lot of work gone in to what is an adequate statistical sampling. So they sample the tank and from that, then they have an estimate of how much plutonium was actually in that material. So originally had the modelled number and that is with a whole bunch of
45 stochastic, Monte Carlo elements in it, so there's a certain level of uncertainty

around that. Now you have a sampled number but it's not a 100 per cent, you don't sample everything and of course there will be differences between the two. That difference is called MUF. Material unaccounted for. And so it goes on as you move down through the chain because ultimately then you would
5 have some fuel elements that might come out of – with plutonium in them, and you then have an absolute knowledge of how much is there, and that will be different to what was in the tank and some of that may be because it's stuck around the edge of the vessel and it doesn't get fully washed off, or could've got aerosolised, or even a little bit of the plutonium could've been, say, in an
10 acid waste stream or something like that (indistinct) can be positive or negative, particularly when there's statistical comparison to then measure, because the statistical comparison might've said that there'll be more, it might've been less. So it's not a sign of bad practice.

15 So how do we then approach this from a safeguards' point of view, because plutonium really matters. We don't deal with accounting alone when it comes to safeguarding the plutonium. What we look at is the system as a whole, and you want to make sure that the system is contained, that you've got surveillance on the system, so that you can say, "I know that nothing got out of there." You
20 know what went in in terms of the spent fuel and you'll see what goes out in terms of the fuel that was fabricated and generated, and if you know this shell is entire because you've got surveillance on it, you've got containment measures in place, you've got process flow monitoring in place which will show if there's anything odd that's happening and if there's a discrepancy where
25 there's some take-off that doesn't make scene - so it's the whole system of safeguards.

So the accounting piece, which includes material unaccounted for, which is generally a very small percentage, then sits within this broader framework. It's
30 not that when you consider how much material is unaccounted for in the US system when there are so many facilities all over the country, et cetera - it is not that they've lost this material. It's a statistical versus a measuring difference, a modelling difference, et cetera, in most cases. I hope that's helpful to understand the concept.

35 COMMISSIONER: Before we go back, if there were to be material lost, how is that reported through the system? A plutonium discrepancy, for instance.

DR FLOYD: If there was a plutonium discrepancy, it would be picked up by
40 the IAEA in their analysis of the various information that they would receive and any other information they would get, not just that, which they're measuring. That's if it's something which is untoward, the system would then pick up that up. If there was something which seemed odd, as I was mentioning before, because of the process monitoring that goes on - because
45 what they're looking for is diversion, has diversion taken place. So if the IEA

had the slightest concern that diversion had taken place, they would be going back in and following up. There's a whole bunch of formal processes of inquiry that then follow through to seek to get that accounted for.

5 And plutonium that you're mentioning, if there was a known discrepancy that came to the attention of my office, we would declare that to the Agency. We don't hide those things. My office is looking for those things. The Agency's role and my office's role are actually similar. Both of us are wanting to make sure that no proliferation is taking place. It's not as though it's only the Agency
10 wants to work that out; it's that my office is dead keen to be able to work that out, yes.

MR JACOBI: You mentioned being able to measure materials within flows, and I'm interested in picking up on the idea of the extent to which it's practiced
15 that there is in fact design of industrial systems to provide for proliferation control, that is, not having to retrofit an old plant, but in fact if you were building a new plant, the extent to which you can actually take account of that.

DR FLOYD: Yes. This is a very important part of safeguarding facilities, is that if at all possible, you design safeguards in at the early design stage. Now, you design safety in; you design security in; you design safeguards in. If you don't in safeguards - let's go back to that as a specific focus - then you may be required to retrofit stuff later, which could be prohibitively expensive, but to be able to achieve the safeguards required, that may be required. So it's in your
20 own interest to make sure that you do this early. It also allows a whole range of possibilities that might not be possible otherwise.

So it's economically sensible, and in terms of the confidence it's sensible, that you do that, and again, going back to the example I used earlier about the
30 Rokkasho reprocessing plant in Japan, the amount of effort that has gone into the design of that plant with the IEA's involvement and the number of people days that are focused on that facility alone, as well as the Japanese government and the owners, is huge, but because of the difficulty and the sensitivity of dealing with plutonium, you really do have to design this stuff in right from the
35 start.

MR JACOBI: In submissions that the Commission has received, there's a suggestion that commercial confidentiality in some way affects the ability to implement safeguards. I'm interested in the extent to which the ability of, for
40 example, a corporation to assert confidence could be a barrier to deriving information that you would otherwise require.

DR FLOYD: Yes. There are various limitations to the information that can be provided. Commercial confidentiality is possible, but the bigger issue is often
45 about security sensitivities, and for sensitive technologies it's actually very

helpful for as few people as possible to know how those technologies work and to have visibility of them, and so for security reasons, there can be arrangements put in place such that it's not disclosing the technology whilst it is disclosing the amount of material and flows and things like that.

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MR JACOBI: Perhaps I can draw a distinction. Does that represent a barrier when it comes to materials accounting?

DR FLOYD: No, not a barrier to materials accounting necessarily. I can't think of an instance where that would be the case, but it means that in some cases, if there's an inspection to take place in a sensitive facility that certain things would be covered and visibility of the actual technology might not be there. So there are some limitations, but that's where, again, it's the whole system that matters, and that's where the containment, the surveillance, the process monitoring, the accounting, all of these things together. And the IEA is not limited to the information provided by states. They also use other information to draw their conclusions, and so if any of this it doesn't hang together, they have the ability then to pursue that further and ask questions and seek to get clarification.

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MR JACOBI: The contention is also made that sovereignty can be used as a barrier, and I'm interested in the extent to which - because we're only considering Australia and the potential for an Australian facility, the extent to which Australian sovereignty could be used as a basis for impacting upon safeguards, given the fact that we are, as I understand it, signatories to the NPT.

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DR FLOYD: Yes. Sovereignty is kind of the argument about, "If the NPT doesn't require me to do it, then I won't," and so the policy disposition that I mentioned that I Australia has on non-proliferation doesn't match that. Australia's policy position is that we wish to be very clear and convincing in being able to demonstrate our bona fides, that we are acting according to our commitments. So, yes, we do have debates, particularly in the context of the International Atomic Energy Agency where some states are saying, "No, no, no. I am not required to do that and I won't," and that's a perfectly reasonable, legal debate, I say to you, counsel, that you can have that debate and a state can say, "I'm within my right not to do it," and they well could be.

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That's not the line that we in Australia would generally take on these issues. So that's how sovereignty kind of plays out. In fact, I think it's quite remarkable when you think that sovereign states chose to join the NPT and in joining the NPT, said, "We will provide all of this information." It's quite remarkable in itself because that was out of their sovereignty. They carved that out and said sure we're willing to share this and allow this sort of invasive inspection et cetera.

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COMMISSIONER: When I look at the safeguards it's obviously built about known technology.

5 DR FLOYD: Yes.

COMMISSIONER: And lots of experience with that.

DR FLOYD: Yes.

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COMMISSIONER: It's been put to us that we should contemplate new technologies and just by way of an example, breeder reactors. So I am kind of interested to understand what sort of safeguards are thought to be required for these new breeder reactors? Are there safeguards? Are they safeguards for the pyroprocessing plant that accompanies them? And then perhaps we could explore what you think would be required if there aren't any?

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DR FLOYD: Right. The issue of first of a kind technology whether it's a reactor or another processing plant or an enrichment or reprocessing certainly comes with major challenges of safeguarding. And the challenge is firstly to design what safeguards you could put in place and would be adequate to put in place, to be able to detect if there was any misuse, diversion et cetera. And to keep running on that example that we have with Rokkasho that has been an ongoing activity for many, many years between the Japanese and the IAEA to design the safeguards arrangements that would be satisfactory for that facility. That's a first of a kind. Now if there was to be a second Rokkasho anywhere in the world which some would doubt, but if there was, well then it would be easier the second time around to look at that. Another case has been looking at the safeguards arrangements required for the deep geological repository in Finland. That has been a multi-decadal piece of research and development and negotiation and consideration by the various players that are involved to come up with that. Now once it's arisen in one case, then the second case will be much easier but it's not actually straight off the shelf to apply those arrangements.

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COMMISSIONER: What – get to that.

DR FLOYD: Get to that one in a minute. That's fine.

40 COMMISSIONER: (indistinct) detail.

DR FLOYD: Just go to your – some of your fourth generation reactor - - -

COMMISSIONER: Yes.

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DR FLOYD: - - - ideas.

COMMISSIONER: Sodium cooled for instance.

5 DR FLOYD: Sodium cooled. Is that there is substantial safeguards challenges
about any new reactor type, as there is for security and safety but to work out
how you then manage those risks for any new reactor type is far from an
insignificant task. The amount of research and development that is required
merely on how to apply safeguards, is many years of work. And then as that
10 technical work is done then you can look at the – the legal and the practice
framework that sits around it. So first of a kind has a substantial overhead in
terms of designing and conceptualising safeguards and then implementing.

COMMISSIONER: Is that the responsibility of the nation that is building the
15 reactor, or is that something that is done in the IAEA?

DR FLOYD: The responsibility sits in a number of places. Obviously the
developer of the technology has a huge vested interest in seeing that the
safeguards can be developed. Again, back to this design – you know,
20 safeguards by design issue is that you want to work that out early so that it all
fits together as a cost effective system. It is a discussion with the international
atomic energy agency primarily but the statue involved and certainly thinking
of a number of technologies around the world, is that their research and
development community had been very involved in looking at how safeguards
25 could be applied. Sometimes it's applying new technologies that haven't been
used before to be able to sense, to monitor, et cetera. It is dealing with highly
hazardous materials but then being able to actually measure and monitor those
things. It's very challenging stuff. So it is an activity that if the state, like if
Australia was to have some new fourth generation reactor to be put in
30 Australia, yes we as a regulator would be involved but I would imagine our
R&D community would probably also have some significant involvement. But
wherever the country of origin of the technology would have a substantial
involvement as well.

35 COMMISSIONER: You alluded to a considerable amount of time to develop
that knowledge, to be able to bring forward - - -

DR FLOYD: Yes.

40 COMMISSIONER: - - - a safeguard regime that would be acceptable to the
international community.

DR FLOYD: The history of this shows that it takes a substantial amount of
time to work through all of these different issues when it's a first of a kind
45 reactor. I look at the GIF forum – Global International Forum for fourth

generation reactors and their timelines and their thinking for reactors like the ones being considered here in Australia, it could be 2035 before there could be a first demonstration and then you've still got all of these other considerations and the various licensing. And so ultimately, when all this stuff is done and
5 licensing is possible - - -

COMMISSIONER: Might the same considerations be applicable to, for instance, an enriching technology like Silex.

10 DR FLOYD: Indeed, yes. Any new first of a kind technology poses technical first of a kind issues that then have to be addressed. I guess that's where using known technology, if it's for nuclear power plants, light water reactors that are well known is a much easier regulatory task and a much quicker process in terms of getting something licensed and established because you don't have
15 these first of a kind issues to have to work through.

COMMISSIONER: Could I now move to deep geological storage and noting that the Finnish and the Swedes that are more advanced, the proliferation and safeguard issues associated with those, could we just walk through broadly
20 what considerations one needs to have in mind about those sites?

DR FLOYD: Yes. I haven't seen the final outcomes as to whether they're up to on the safeguards issues for the Finnish repository. I certainly have seen some of the earlier stuff. I'm involved in the IAEA arrangements, I actually
25 chair the standing advisory group on safeguards implementation for the director general of the IAEA and so we provide him advice on safeguards implementation matters, so I get to see some things that aren't necessarily publicly available and I won't go to any of those confidentiality but the broad issues, the challenge with a long term repository of spent fuel from a
30 proliferation point of view and therefore a safeguarding point of view is that you're dealing with a facility which has a life for centuries at least. You're dealing with a facility – you are dealing with material where it's accessibility in terms of its radioactiveness will change over time and it could become more accessible in that sense further down the track. You are dealing with a facility
35 that could have a large amount of nuclear material that if somebody was able to get hold of that and then potentially reprocess that, then they could have many bombs worth of plutonium that they could extract out of that. So that is the kind of concerns.

40 So we go back to this issue of how do you then have confidence that that material is secure and is not being diverted when it is deep down in a geological repository? And so there are a range of technologies that one needs to think about whether it's ground penetrating radar to be able to detect what's there, whether it's vitrification so that you could put material in to a matrix
45 which would render it unrecoverable but if you had doubts at some point then

generally you need to be able to find the material so that you can actually verify what is going on. And so these present all sorts of major challenges. Challenges that have to be thought about over the time horizon of centuries.

5 So that's the broad sense, is that there's material, if it was to be extracted and to be used, that it could be used for weapons purposes and reprocessed. So there needs to be then confidence that that either cannot happen, or if it was to happen, would be detected. So again, the whole issue of containment, surveillance, et cetera, on a site, and many different technologies would come
10 to people's minds as to what you might want to use, and I would say over the lifetime of that facility, being hundreds of years, the technologies that would be used further down the track will be quite different to the ones that are being thought about now.

15 So it's a significant safeguards issue, but I understand that they've come to some arrangements as to how that can be adequately done in Finland. So if Australia was to go this route, well, then there's a lot of stuff that we'll be able to borrow and learn from the Finnish experience.

20 MR JACOBI: We've already had a bit of a discussion about the sorts of bilateral arrangements that would need to be entered into. I'm interested, just in broad terms - thinking about it, I think you referred to the NSG Guidelines - about what the arrangements would be that would be required for us to access sensitive nuclear technology, which, I guess, are associated in some way with
25 the non-proliferation aspects.

DR FLOYD: Yes. Much of what we discussed has been about nuclear material and not the technologies. The technologies are controlled through various export control regimes, and the Nuclear Suppliers Group and the
30 controls around that is the most relevant of those. So it is not specifically about does the NPT allow you to do something or not allow you to do something. It then becomes do the export control regimes allow it or not, or what are the constraints that might be put in place by the Nuclear Suppliers Group, and that's where the control is exercised.

35 COMMISSIONER: Can I just pick up on that? We read in reports about black-boxing technology and the effectiveness of that as a means controlling access to technology. It was also put to us today that what man can create to protect, man can also create to access.

40 DR FLOYD: Sure.

COMMISSIONER: In terms of black technology, is that respected as a means
45 of protecting technology internationally?

DR FLOYD: Yes, it is. Black-boxing, covering in various ways, whether it's by information barriers that would be put in place or physical measures, et cetera, essentially just making it so that people who don't have knowledge of the technology can't gain that knowledge, yes, is a broad practice which is used
5 for a whole range of sensitive technologies. As we discussed earlier, zero risk is unattainable and as long as humans are involved, then there's always issues that could arise, and that is where you then manage that risk and look at how you would then control that.

10 And I have sympathy for those who would say, "Well, if there was no such technologies, well, then it wouldn't spread." Yes, of course that's true, but I'm also heartened then by - and my concerns also go to the AQ Khan network, which is a well-known proliferation of technology that has caused globally quite some concern. So, yes, it can happen; there's an example. But I'm quite
15 heartened by the overall performance of the Nuclear Non-Proliferation Treaty when it comes to limiting proliferation. When that treaty was being negotiated back in the 70s, they had an expectation that by the year 2000 there could be 25 or 30 states that could have nuclear weapons. That was the reasonable expectation on the basis of what they saw.

20 And here we are now, well the other side of the year 2000, and we still have the five weapon states that were recognised as having tested weapons before the NPT came into being. Then we've got three states that never joined the NPT, so that's eight. Then we've got North Korea on top of that. That's nine.
25 That's not 25 or 30. So, yes, there's always people who will seek to work around a system, and this is what keeps us always having to be on the edge, never to be complacent, is that our battle is never over. You haven't solved it and then you can just relax. It's an adversary of proliferation that needs to be continued to be addressed.

30 So I see that there are some encouraging signs that the arrangements can make a difference. Can they deliver zero risk that anything could go wrong? No, but there's very few things in life that can deliver that. I think the message is that we must maintain our vigilance and our focus on these important issues.

35 MR JACOBI: I want to come back to the treaties that we were talking about before, in terms of the arrangements. I'm interested to understand the sorts of time frames that are involved in negotiating the sorts of treaties that are nuclear cooperation arrangements and those sorts of things in order to be able to share
40 technology between countries.

DR FLOYD: The time frames to set up the treaties?

45 MR JACOBI: Yes.

DR FLOYD: It varies quite a deal from country to country. It can be very quick in terms of the negotiation. If a country is willing to accept our normal treaty arrangements, then one could move through that quite rapidly. But the whole process is likely to take a couple of years, and it could be longer.

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MR JACOBI: And longer for new technologies if one wasn't simply - - -

DR FLOYD: Okay. Yes. I was thinking the process for normal nuclear cooperation agreement, because there's a mandate-seeking part which requires Cabinet's consideration, there's actual negotiations and then there's the administrative arrangements and then the finalising and all of those sorts of things. A couple of years for our normal sort of arrangements is what we consider. For the first-of-a-kind - dare I use that terminology about a treaty - if we were doing a first-of-a-kind treaty which was dealing with some of these sensitive technologies, it probably would take us longer, because of each step of that process would be having to think about and work on things for a first time, so there would be some time.

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Now, some of our treaties, in the broad, could be used to facilitate technology cooperation, but I would imagine in most cases there would be additional legal arrangements that would be put in place, particularly if it meant Australia getting access to sensitive technologies.

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COMMISSIONER: Can I just go back to peer review? We've heard about peer review of particular parts of the nuclear cycle. Could you outline your peer review, and perhaps talk about the broad process within the IAEA and what it seeks to achieve.

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DR FLOYD: Yes. Most of my evidence today, Commissioner, is focused on safeguards. Maybe I'll talk about security on peer review, because security is a very important issue as well, and as Dr Carl-Magnus Larsson gave in his evidence some time ago about the peer review processes on safety, there are peer review processes on security and also on safeguards. On security it's called an IPPAS mission, which is an International Physical Protection Advisory Service mission, constructed of an international team, as well as representatives from the IAEA, where there's a negotiated scope for that particular work; a large amount of preparatory work required by a state to go through in preparation for such a mission.

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And in the case of security, it's looking at how well we are implementing essentially the Nuclear Security series recommendations on how security should be implemented. We had one of these missions in November of 2013, and I must as regulator responsible for security it was an incredibly helpful and useful thing to have, where a bunch of experts from other countries and from the IAEA cast an eye over how we do our stuff and then they give us the

benefit of their collective experience as to things that they would recommend or suggest that we think more about or do differently et cetera. Tremendously useful. Various of my staff and also some others from the Nuclear Science and Technology Organisation participate in these reviews in other countries and so we then learn from other countries as to how they implement. This has now become, and largely this is because of the Nuclear Security Summit process that President Obama kicked off, is that it's now become considered like the normal standard that responsible countries would do. Is that they would have IPA submissions. It's not based, again, on treaty compulsion. This is another one of these examples of what you could do out of your own sovereign choice.

And good practice with the IPA submissions is that you would have a follow up IPA submission where you have had a chance to respond to the recommendations, put things in to place and then say well now come and have a look again. So continuous improvement by all countries involved, a great thing. I think there is some 60 odd countries now that have had IPA submissions, so that's a good thing. In the safeguard space there is ISAS activity, so it's another peer review activity. It's a little bit different to these others because our safeguards interaction with the IAEA is very legally based, while with safety and security a lot of that is the responsibility of the state and you've got recommendations and guidance and things like that coming from the IAEA. So in safeguards, we have legal requirements and there is a process where we are constantly getting feedback and various reports on whether our reports were adequate, appropriate, whether there's any problems or not. But on the broad as to how it is implemented there is these ISAS submissions. So similarly, it's a peer review that looks at your broad approach to safeguards implementation rather than your reporting and your activities with the agency. Very important activities.

COMMISSIONER: I do think we want to move to security but there might be some final safeguard questions.

MR JACOBI: There is just one. And we heard in evidence this morning some issues with respect – and criticisms of the agency with respect to difficulties associated with the timelines for detection and the ability to in fact act, I am just wondering whether that can be placed in an Australian context and whether you have particular concerns about the ability to detect something in Australia and then to act?

DR FLOYD: Yes. Yes. The time to detection is obviously a very important characteristic of the safeguard system and this has been born out publicly with the Iran deal and the negotiations there, is that you've got to have adequate visibility far enough ahead to know that you've got a problem, so that if a nuclear weapon was the target, that you could take appropriate actions early enough.

MR JACOBI: The task of the Commission is to focus, I guess on the potential for facilities in Australia to be developed so the - - -

5 DR FLOYD: Yes.

MR JACOBI: - - - challenge isn't the challenge with Iran, I am just interested if one puts oneself in the context of Australia today, or perhaps 10 years in the future, what is the position with respect to the difficulty of a timeline to
10 detection and then to act?

DR FLOYD: Yes. The reason I use the Iran example is that we've got to start thinking about Australia as a proliferator. That is the context that we've got to think about this timeline and timely (indistinct) and so the question then is,
15 well as we are at the moment, the biggest concern would be say diversion of uranium. It's undeclared and it's been diverted somewhere and somebody's getting it and they're using it for a weapons programme. So we've got to work out well then how do we assure that that's not happening. How could we know soon enough that it's not happening? Now if that was the case, and you're
20 dealing with uranium or concentrates, your biggest signature of your problem is not going to be the uranium or concentrate that might have been diverted but it's the facilities further down the track that somebody has got to have somewhere. So it is not so sensitive in that way. But if we were to develop some of the sensitive technologies, have facilities on those sensitive
25 technologies here in Australia then the timeline is much shorter and the confidence that people would have. But it's got to be based on a scenario of proliferation.

And the scenario of proliferation essentially is going to be Australia as
30 choosing to proliferate. Well, clearly Australia is not choosing to proliferate and the agency would have its interests as to how quickly it needs to be able to detect whether we have got clandestine activities, whether we are diverting, whether we are misusing our nuclear power plants so that we could develop more plutonium by running them inefficiently and these kinds of things they
35 then need to know. Now if you're going to misuse a nuclear power plant, then the monitoring that's in place would show that up very quickly. And so the detection time is not a problem in those scenarios. So it's an area where there are people in the agency that are focussing on detection times very, very closely at different points in the fuel cycle and for different reasons, to see can
40 it be adequately managed. We would always want better.

MR JACOBI: Can I pick up, I think the issue – the scenario of diversion takes us I think to the question of security and I am just interested and perhaps you can just briefly outline the extent to which I understand we've got a risk based
45 approach and I am just interested to understand perhaps first what are the key

risks, or what are the key risk materials that are identified in such an approach?

5 DR FLOYD: Yes. Well the – for security there are two broad areas of concern, is that one area of concern is theft, that somebody is going to steal material and then use it for a nuclear explosive device. So if they're going to do that then the primary interest is going to be plutonium and it's going to be highly enriched uranium. The second part of security is more about protecting against the risk of sabotage, of using the facility as source of hazard, daren't call it a bomb but a source of hazard et cetera and so compromising it and
10 blowing it up or whatever. So the materials and the concern are slightly different. In sabotage then you're looking at well then what is the potential consequence of something being breached or being blown up to the hazards to human health that might surround those areas, while theft is take the material and then use it to make an explosive device. That said, on the theft side we
15 have a structured arrangement of different tiers of concern of three different levels, depending on the amount of material that might be held in a facility. So they are categorised, there's category 1, 2 or 3. And it depends on the amount of plutonium or the amount of highly enriched uranium et cetera that might be in a facility.

20 That then feeds in to the risk based approach to security and the risk based approach to security ultimately then results in security plans for facilities and those security plans are developed by the facility owner/operator and are then – and often in consultation with my office. We don't work at arm's length, so
25 that we are disinterested but we are very happy to go on that journey with the facility but then we ultimately then assess those plans. And a fundamental part of that plan is what we call the design basis threat. So this is essentially a scenario of threat that we, together with the intelligence community, come up with and define and then the security plan has to meet and so it would be to do
30 with how many people, what level of capability they might have that might be seeking to compromise a facility and so the security plan has to then meet that. It also has got elements not just of say forced entry but also of cyber security elements as well. So there are different parts to the security plan. So it's all in that risk environment and it's fluid and needs to be revisited and revised as the
35 risk environment changes. It certainly then talks about layers of defence, and defence in depth is that you don't then just rely on one layer, but you deal with multiple layers, you deal with multiple technologies, et cetera, to ensure your security.

40 MR JACOBI: I'm interested in perhaps stepping beyond the idea of the plan itself and how the plan is developed, but the extent to which that plan is then tested against scenarios to the extent to which people might have practice implementing such plans.

45 DR FLOYD: Yes. The plan is designed against a scenario to begin with, and

then the security arrangements are tested with exercises in various times, and exercises are an ongoing and not an uncommon activity at a place like ANSTO. They are very vigilant at testing their systems via exercises. Those exercises would reflect the design basis threat in various ways so that they're realistic and reasonable. That ties into some of the other responsibilities that ARPANSA has in terms of emergency response and some of those elements, so it all interacts together. So, yes, there's quite an active program of exercising that goes on at these facilities. My staff are also involved in testing the security in some facilities as well, yes.

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MR JACOBI: One of the issues that's been raised is - I think it was suggested in a submission - and these are expressed in terms of risks, that there's a risk that nuclear radioactive material should not be targeted. I think it's expressed in terms of "terrorist transport". I'm interested to understand the extent to which that sort of sabotage scenario or diversion scenario might be planned for.

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DR FLOYD: Yes. Transport security is an important part. My comments thus far were more on the facility rather than transport. Yes. Transport can be a vulnerability; you've got things on the move and you've got less control space. But you've also got measures that you can put in place. Transport plans are required to be submitted to my office for nuclear material and we then review and consider those plans. There are, as I say, pluses and minuses about in-transit as to some things are easier, some things are harder. But then we have risk-based recommendations as to what sorts of measures need to be put in place.

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COMMISSIONER: I think, as the last question - unless my trustee counsel has more - is this concept of a state-level approach where there's full integration. I've heard it, but I haven't seen any of the details. Could you walk us through that process and how you think it might apply to the sorts of activities that we've got under consideration?

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DR FLOYD: Yes. The state-level approach and the state-level concept is the latest evolution of how safeguards are implemented, and there's some serious work been done in the Agency, the International Atomic Energy Agency, and elsewhere, over quite a number of years. The basis of it is that it is better to be able to look at a state as a whole when considering issues like what sort of frequency and intensity of safeguards need to be put in place rather than having a formulaic criteria-based approach which says, "If I've got a facility of a particular sort, then I have to have these particular measures in place, that's it." But if you can look at a state as a whole, then you can calibrate your level of concern, which then affects your intensity and frequency of putting safeguards in place.

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Now, to bring that home is that when the IAEA looks at Australia and sees that

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we do not have enrichment, we do not have reprocessing, we don't have power plants, we've got lots of uranium. They look at then pathways for acquisition of material technologies for weapons development and they see actually the pathways are pretty sparse for Australia to get from what we've got to a
5 weapon. And so their assessment then would be of lower concern and therefore, the implementation of safeguards in Australia would be at less frequency and less intensity.

10 If we were to then have more elements in the fuel cycle, then they would take that into account when looking at the state as a whole, and they'd be looking at the acquisition pathways, which then would be more and more direct if we had that. If we just had, say, light-water type reactors, well, then that takes you one step further forward, but you've still got reprocessing, which would have to be clandestine. So it's still difficult, but it takes you a significant step forward
15 over just having uranium being exported. The result would be that the intensity of safeguards in Australia would be higher; the frequency of various measures would be higher.

20 So if Australia is to take a decision to move towards greater elements in the fuel cycle, there's an impact for the Agency; there'll be an impact for my office, et cetera, particularly if we're dealing with some more novel aspects. There'll be substantial upscaling required in my office and adding extra skills, et cetera. But these things, Commissioner, are all doable.

25 If you're coming towards your last question, I want to give you my last pitch, and my last pitch is that the risk of proliferation is always serious and the risk of security is always taken seriously, and my task, my statutory responsibility, is to manage those particular risks. We do that with the nuclear footprint we have at the moment with a research reactor, with uranium mines, with the
30 transport that is associated with that, and then the following of Australian-obligated nuclear material around the world.

If Australia took the decision to have additional elements in the nuclear fuel cycle here in Australia, then my office would continue to seek to do that. In
35 my statutory responsibilities I would continue to report to the parliament on our performance on nuclear security and on safeguards, and we would be more engaged with the IEA on a whole bunch of things than what we are at the moment if we had these other footprints. I would say that these risks are manageable, and when I look at the international system and the national
40 system that we have in place, with that appropriately scaled up and appropriately resourced, et cetera, we can continue to manage the risks, which are serious and must never be discounted, to deal with proliferation and security. It's not beyond the wit of man to do that.

45 COMMISSIONER: Dr Floyd, thank you very much for your extensive

evidence. We appreciate the time that you've taken to join us and for the preparation of the work.

DR FLOYD: Thank you.

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COMMISSIONER: We'll now adjourn until Monday.

**MATTER ADJOURNED AT 2.28 PM UNTIL
MONDAY, 30 NOVEMBER 2015**

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