RESUMED **[5.31 pm]**

COMMISSIONER: This afternoon we will move to the topic of Nuclear Education and Skills Development, and I welcome from the UK Professor Jon Billowes and Dr John Roberts. Gentlemen, thank you very much for joining

us. Counsel.

MR JACOBI: Any potential expansion of the nuclear industry in Australia will bring with it a need to develop a local workforce with the knowledge and skills to competently plan, construct, operate and regulate a nuclear project. A wide range of skills would be required, including project licencing, safety and radiation protection, sciences such as physics, chemistry and engineering, as well as trades, especially during the construction phase. In addition, skills and knowledge must be built up within a credible regulator to ensure effective oversight of a project through all stages of its operation.

The public sessions on this topic aim to explore the extent to which Australia's current nuclear reactor education and training capabilities might be further developed and the key steps to be considered in terms of building a competent workforce were Australia to embark upon a new nuclear project. In this forum, this topic consideration how other countries have approached this task will be instructive. In today's session, the Commission will examine the model developed during the recent expansion of nuclear education and training programs in the UK with a particular focus on lessons which may apply in the Australian context.

In the course of subsequent sessions on this topic, the Commission will also discuss the state of Australia's competencies and capabilities and the potential pathways and time frames to their development, lessons to be drawn from the process followed during the development of Australia's newest research reactor, and also the process for building research and training capabilities in Australia.

The Dalton Nuclear Institute was launched at the University of Manchester in 2005 and is the leading centre for higher learning in nuclear science and engineering in the United Kingdom. It offers a range of programs for nuclear skills training, including undergraduate and postgraduate qualifications, as well as professional development courses for the domestic and international nuclear sector. Professor Jon Billowes is a Professor of nuclear physics at the University of Manchester where he is the head of the nuclear physics group and he served as the director of education at the Dalton Nuclear Institute during its formative years. He holds a doctorate in philosophy and nuclear physics and an MA in physics and he is a Fellow of the Institute of Physics and a member of the UK Nuclear Institute.

Dr John Roberts, who is on the right, is a Nuclear Fellow in the School of Physics and Astronomy at the University of Manchester. He is also a visiting academic at the Imperial College, London, and an external examiner at the University of Central Lancashire in the area of nuclear safety, security and safeguards. He was previously a Nuclear Fellow at the Dalton Nuclear

Institute. Dr Roberts holds a PhD in nuclear physics and a bachelor of science with honours in physics, and over the past 26 years he has held multiple research, fellow and associate roles at universities across the UK, and the Commission calls Professor Jon Billowes and Dr John Roberts.

COMMISSIONER: Gentlemen, thank you for joining us. I might start with a general question. I understand there was a lot of activity in 2005 to perhaps re-establish the nuclear education framework. What had happened before that and how did that lead you in 2005 to take the actions we're probably about to discuss?

PROFESSOR BILLOWES: I think slide 1 is quite interesting to look at here. It's the history since 1980 of the nuclear industry decline. The top band is British Nuclear Fuels Limited and you can see that by 2004, the nuclear industry was reduced to about 600 people in British Nuclear Fuels and that became the National Nuclear Lab. They provided the strategic thought to the UK in nuclear and they identified skills were being lost from Britain. If Britain ever wanted to go back into nuclear power, those key skills were missing. So BFL set up university research alliances, two came to Manchester, one to Sheffield, one to Leeds, and at the same time, there was work going on with the lack of youth education in British universities.

Research funds are declining rather like the skills base is declining on slide 1. So by about the year 2000 there is almost no research money in nuclear going to universities, and so those departments close. There is no undergraduate program with the word "nuclear" in its title, and it was around 2000 that alarm bells were ringing. So Manchester partnered with British Nuclear Fuels at that time to try and turn it around, and the first thing we did was look at the nuclear education area and that's where we set up this nuclear consortium. Manchester at the time could not do everything. It had a lot of gaps in its nuclear skills. It had no nuclear reactor physics, no fuel performance expertise, no decommissioning and waste expertise, or radiation science. So we had to partner with other universities to bring the whole spectrum of necessary schools together.

MR JACOBI: You've spoken of a consortium model. I'm interested in where that consortium model had come from and how you came across the idea of developing such a model.

PROFESSOR BILLOWES: Well, it happened twice. In Europe Belgium did this for nuclear engineering, five universities, and in Britain five universities have done some marine technology, and so getting British universities to work together was quite difficult, but since it had been done for marine technology, we more or less copied exactly what they did and changed the marine to nuclear, and this was accepted. Universities would accept it more readily

because it was already a model that existed in Britain.

DR ROBERTS: (indistinct) there are two reports published in 2000 and 2002 from the Health and Safety Executive and part of that organisation is the nuclear inspectorate of nuclear installations inspections originally, and those reports identified the lack of nuclear education within the UK university sector and thought the best way forward would be to do a postgraduate degree rather than doing the graduate nuclear engineering degree. So that was the drive that pushed us towards establishing a masters-level program to give nuclear education on top of high quality, generic engineers and scientists that were required by the industry.

COMMISSIONER: The leadership for these partnerships, was that a university initiative, was it a government initiative, and who funded it?

PROFESSOR BILLOWES: It was on university in partnership with British Nuclear Fuels. British Nuclear Fuels knew they were disappearing and I think they wanted to leave the country in a state that would allow them to move forward in nuclear, and so they partnered with Manchester University and (indistinct) supporting other partners. So it wasn't government and it wasn't at that stage research councils. It was done by people in universities and the BNFL.

DR ROBERTS: We've also seen the privatisation of the Central Electricity Generating Board in the UK (indistinct) nuclear party. So those skills were in those organisations and dissipated throughout the nuclear industry, but we may (indistinct) capture. So BNFL perhaps looked at the situation and thought, "We can't let that happen again to another set of skills (indistinct) of the workforce. We want to leave a legacy."

COMMISSIONER: Okay, and so there was investment from BNL as well as the universities.

PROFESSOR BILLOWES: Yes. So British Nuclear Fuel provided a team of about four people who work with Manchester, which provided about one person, and that got Dalton Nuclear Institute going and got the NTEC program going mostly through meetings with the other universities and many meetings with the industry to work out exactly what the industry wanted, and the industry then was focused on decommissioning. People realised that it was important to keep the nuclear option open, and so BNFL had a long view that nuclear would come back.

DR ROBERTS: It would seem through the university research alliances that the British nuclear fuel have a project manager for each of those university research alliances to establish the close connections between Manchester,

Sheffield and Leeds Universities with the BNFL so we were used to working with them. So we kind of had a trusting relationship and we knew we could push forward on some of the research alliances to move in to education as well.

COMMISSIONER: So research was the foundation for the learning skills as well?

PROFESSOR BILLOWES: Yes. The education was so critical that meetings were had with the research council, Engineering Physical Research Council and they agreed to fund this masters programme, the ENTEC masters programme and it was that money that was key to get the education going but the research groups were funded by British Nuclear Fuels at the start.

MR JACOBI: I just want to pick up on the key elements of the qualification, you've described as a masters programme. Is it – I am just wondering what it's a top up on, in terms of other engineering qualifications? What the prerequisites are at the earlier level?

PROFESSOR BILLOWES: The prerequisite is a first degree in engineering or a physical science discipline and as Jon said, it is designed to nuclearise people with good generic engineering and physical science skills. It's not a nuclear engineering degree; you don't need that many people with nuclear engineering as a degree. You do need good engineers that understand what nuclear means when they work on a nuclear site. So that was the purpose of the masters' programme. It was a nuclearisation of already good engineers and scientists.

DR ROBERTS: A typical ENTEC student might have a mechanical engineering undergraduate degree. He will complete the ENTEC masters programme and then work as a mechanical engineer on a nuclear plant.

MR JACOBI: I will come back to the components of the course but I just wanted to pick up first with respect to the universities and perhaps to deal first with the particular specialty of the Dalton institute in terms of what it's delivering as part of the programme and then I wanted to also deal with what's been done at Sheffield and Imperial College?

PROFESSOR BILLOWES: Okay. When (indistinct) started we had materials performance in regards to the research alliance with the BNFL and the radiochemistry university research alliance. When we started the ENTEC consortium, we wanted to balance the delivery out across the partners and (indistinct) didn't want to be seen to be dominating what should be an equal collaboration of the partner universities. The universities were included based on their research strengths or perhaps their historical masters' level teaching strengths. So Dalton's contribution to the programme was in radiation and

radiological protection, so that was really from the nuclear physics. We have a materials – what's the (indistinct) Jon? Nuclear materials and light time behaviour.

DR ROBERTS: Yes.

PROFESSOR BILLOWES: But from our materials performance group we do a module in policy regulation and licensing because we also have that expertise or some of that expertise in the university at the time. Imperial came in because they did – they had good expertise in nuclear reactor physics and so they gave a course on water reactors and Sheffield expertise was in waste mobilisation and so they – what's their title?

DR ROBERTS: The processing (indistinct) nuclear waste is run by Sheffield University and the Sheffield materials department has a long history of expertise in ceramics and glass and also they have a cement expertise there as well. So when BNFL were looking for partners on the waste mobilisation site, Sheffield was one of the natural universities that (indistinct) partnership. Basically, about in 2001 the university (indistinct) so they were natural to fill in that gap for the skills for waste mobilisation.

MR JACOBI: Yes. Just hoping we might be able to go to slide number 4 because I am interested that you might be able to explain the management structure by reference to that particular slide and explain how there is an overarching management of the consortium?

PROFESSOR BILLOWES: Slide 4 isn't it? So the coordination centre is in the department of physics at Manchester and the steering group is the real body that looks after this consortium and the steering group is made up of one member from each of the 10 universities in the consortium. The chairman of that group is elected every three years and it's not normally a Manchester person who chairs that group. So although the programme is coordinated from Manchester, it's sort of a hands off approach. We've set up recently a governance board on the top right there but for 10 years we hadn't had that board but it was felt that the registering universities had special issues on programme policy and handling the students and so that governance board has been set up, involving Liverpool, Manchester and Sheffield to look after the quality assurance aspect of the programme.

MR JACOBI: And I was interested in particularly understanding the role of industry in both the management of the programme and its input overall in to what is taught and how the modules are operated?

PROFESSOR BILLOWES: Yes. Well, they're equal because (indistinct) right at the beginning before we started the programme we must have spent at

least a year on- well, we started off getting them all in – in about 20 representatives from across the industry in the room at the same time and that was a very difficult meeting because no one wants to reveal their problems with recruiting to their sort of competitors so we ended up having one to one meetings with all the companies. There was probably about 20 or 30 companies involved and what they wanted to see in a masters programme, what were the main areas we ought to cover in that programme and what the delivery format was because we wanted – our primary aim was to help the people already in industry to improve their skills on some of the delivery format (indistinct) with their work. So we call it short course format, so each module is a maximum of five days away from their place of work, where they're sort of taught intensive taught element and then there's post course assignments or pre-course preparation that they do outside that.

DR ROBERTS: Industry has no influence in the day-to-day management of the programme but it's an advisory role and we maintain a conversation with industry throughout the whole of the programme. We have meetings with (indistinct) advisory board annually to maintain that our course is still relevant to the needs of industry. We haven't just set up a programme and then – we'll then without further consideration of industry needs. So sometimes industry will come to us and say we'd like you to develop a module on this set of skills. So we listen to industry and the varying demands as we go through the years.

MR JACOBI: Are parts of the course delivered within industry itself, in terms of their being access to real world engagement in nuclear facilities?

DR ROBERTS: We have industry lecturers who are a very important part of the programme and we also have some visits embedded in to the programme and we also do extra visits as well outside of the individual programme. So we give (indistinct) for example going to BA systems, going to the (indistinct) nuclear power plants and going to (indistinct) decommissioning power plants as well.

PROFESSOR BILLOWES: And as far as possible we like the project work, the three-month project that the students do in the summer, we like that to be based with a nuclear company. That's not always possible for overseas students but getting UK students on UK nuclear licence sites is a manageable problem.

DR ROBERTS: Another really interesting facet of the programme is that we deliver to part time students and full time students at the same time. So the part time students coming from industry already have a job, so they can act as kind of recruiting sergeants for their industry but say that's a really good company to work for, they pay for me to go on this programme. The full time students because of what's (indistinct) country, what the facility's like, what's

it like to work at that company. What are the career prospects like? So it's a very good interaction between the full time and part time students.

MR JACOBI: Can I just very, very quickly just come to slide number 5 and just in broad terms I am interested to understand, as I understand if one wants to take the programme full time that one is looking at a year and I am just interested as to whether you could explain the layout of the modules across a year or part time across three years?

PROFESSOR BILLOWES: So the one-year person, the fulltime student person, from September until June does eight taught modules. The overlap in that the post-course assignment for one module is going to overlap with the elector element of another module. Depending on which modules they take, we try and balance it as four modules in semester 1, four in semester 2. We're doing a semester here, so there's two semesters a year that we work to, although this masters program doesn't really acknowledge the semester system because we work through the vacations. And so as you go up that ladder, the eight modules are completed by June and then the project work, which we hope is on a nuclear site, is three months, 600 hours in total, and that work is done with a company.

If you're a part-time student, you would normally take four modules per year in your first two years, and so that's four times five days out of your work each year. We're more flexible with the part-timers. If their job description changes - they might want to change their module choice in the next year - their project will be based with their company as far as possible and that will depend on what their job is by the time they reach the third year of the program. But sometimes pressure of work means that they have to delay the rate at which they do this module project and we're very flexible on that.

MR JACOBI: Can I move away from the program and come to the research facilities. We understand at Dalton that there's a nuclear research facility, the Dalton Cumbrian Facility, and I'm interested to understand each relationship to the program and indeed, the other facility which is the research facility, the NNUF facility.

PROFESSOR BILLOWES: The Dalton Cumbrian Facility was another project that Dalton got into fairly early on, but it took a long time to get going. They had to recruit the professor of radiation science from America, for example, and the NTEC program was already running. By the time they really got the Dalton Cumbrian Facility open, we'd been running for some years. So there's not a great deal of connection between the two, one is research and one is teaching, and they aren't involved in delivery of any of the modules on the NTEC program at the moment.

DR ROBERTS: I was going to say (indistinct) facility. This is a way of leveraging money from government to support nuclear research and (indistinct) the DCF (indistinct) facility, the National Nuclear Lab and the (indistinct) have come together in a virtual way to provide (indistinct) for equipment to be purchased and upgraded and shared between the nuclear committee within the United Kingdom. So there's no actual new building being built. It's just funding of materials, research equipment in the initial phase, these detectors which can (indistinct) for the benefit of the whole community so people get time on those bits of equipment that help those facilities. Rather, DCF itself has just been available for the University of Manchester, for example.

MR JACOBI: I want to come to the issue of skills planning, which I assume is critical to the way that the NTEC consortium runs its programs. We've heard of NESA, the Nuclear Energy Skills Alliance. I'm wondering whether you can explain what its role is in terms of planning and particularly the delivery of non-professional skills.

DR ROBERTS: This is (indistinct) Department of Energy and Climate Change which is looking to bring together all the organisations involved in skills training within the United Kingdom. Particular focus is on (indistinct) skills, so (indistinct) bringing students into the program after the age of 18 (indistinct) level after a low-level foundation of (indistinct) to take them into the nuclear industry because we need (indistinct) of that qualification person rather than a degree person going to the industry. So we have a National Skills Academy system within the United Kingdom and we have a National Skills Academy for Nuclear.

So the chair of the National Skills Academy for Nuclear (indistinct) skills zones to make sure everybody is working together and pointing in the same direction to bring those students. Recently they've established (indistinct) agreements with Lakes College in West Cumbria and Bridgewater College which is in Somerset (indistinct) focus on a nuclear apprenticeship scheme. So again, this is a (indistinct) apprentices for that with the industrial sectors in the United Kingdom. We are focusing on (indistinct) so there's quite a few activities being funded and being led by (indistinct) in cooperation with this Nuclear Energy Skills Alliance.

MR JACOBI: I wanted to pick up in terms of the demand, on slide 2 it's a source from NESA, information with respect to workforce demand associated with (indistinct) I'm wondering whether perhaps you can explain that.

DR ROBERTS: Explain the graph or explain the source?

MR JACOBI: No, whether you could explain, really, the upshot of the challenge that the UK is facing.

DR ROBERTS: This is really important information for both the industry and the universities. It means we've now got the forecast for work, for people to enter the workforces, and without these predictions we can't set up university courses that can provide the skills required by the nuclear industry. If you look at the new build program, there is also another prediction to be put forward by NESA on (indistinct) skills (indistinct) across and they (indistinct) program, the decommissioning program, the GDF program, et cetera. We would need to know when the peak is going to be. We also need to understand that we're going to be in decline. So we know that there's going to be a reduction in (indistinct) after (indistinct) so this is really important information for universities and the nuclear sector.

MR JACOBI: I just want to pick up on slide 3, and I'm interested to understand the implications of that in terms of the delivery of courses.

DR ROBERTS: This is a projection by the nuclear (indistinct) university, which showcases that you can't just set up a nuclear (indistinct) program or a nuclear education program without some prior thought. This forecasts that nine years prior to the actual connection to the grid, you need to be training a certain number of people (indistinct) a two-year degree and a certain number (indistinct) you start peaking your years 4 to 5 before connection to the grid, and again, these are really important (indistinct is to make sure you have your education program set up early to allow you to come - that workforce to be trained in time for connection to the grid.

This is a long-term project. Any nuclear program the IEA says is about a hundred-year commitment for any nuclear power program. You have (indistinct) program if you're during very well, then you have a 60-year operation program and you operate some new reactors, and then a 30-year decommissioning program. So this actually predates the connection to the grid and is part of that hundred-year plan as (indistinct) Atomic Energy Agency.

COMMISSIONER: Industry provides you the numbers?

DR ROBERTS: These are from the Nuclear Power Institute, Texas A&M University. I'm not exactly sure where they got their numbers from.

MR JACOBI: You spoke of a whole series of trade-related courses, and I'm interested in whether they're structured in terms of also being a top-up related program associated with general trade skills, or whether they are a nuclearisation, I guess, of other skilling.

DR ROBERTS: I think the gaol of the two-year technical program is to make sure people are (indistinct) generic skills of engineering or science or decided

to go through the program. They'll also be taught within an equal environment. There are certain particular (indistinct) to equal education (indistinct) operation funds. So people need to be aware of that nuclear impact of their (indistinct) the power pump, we need to know certain amounts about the nuclear industry and about the nuclear sciences involved (indistinct) worked on a construction, a road or building, for example.

So all those skills that people put through the apprenticeship level are electrical engineers, civil engineers, mechanical engineers, all need to have some kind of nuclear knowledge so we can embed that within the two-year program to make sure we corral a more rounded person (indistinct) contributes from the start of their working life.

COMMISSIONER: In Australia we've had great difficulty convincing secondary students to mathematics and science subjects and so-called stem subjects and this has impacted on the number of engineers and physicists we can grow. Have the UK faced a similar problem and if so, how did you get around that?

PROFESSOR BILLOWES: I think the answer's yes. There's quite a lot of PR work that goes on stem subjects. We have – the Dalton University, a guy called Brian Cox, who is constantly on TV and very popular with sort of teenagers. There's a guy at Surrey University called Paddy Regan that's on TV and radio a lot. They sort of popularised science, so that really brings them in. Manchester has to problem filling 300 physics places a year for example.

DR ROBERTS: And we are very lucky at the moment, we've got things like the Big Bang Theory on TV which is kind of putting the spotlight on the kind of science world on TV, the physics world. The UK TV (indistinct) does contain quite a fair amount of science documentaries, so all those kind of things help. I refer to in the document about the Apollo missions, these are really kind of key things that kind of drive people to (indistinct) and they're interest in a career in science and engineering. There (indistinct) projects like that, it helps attract people to these programmes. We changed from a free education system at university level (indistinct) to a fee pay system over the last decade, 15 years or so. So students now need to make sure that they're doing a course which is going to lead to a proper career for them, so that's also helped bring students back in to those stem subjects at university.

COMMISSIONER: Hasn't helped here.

PROFESSOR BILLOWES: The main sciences that bring them in appears to be nuclear and pastoral physics and astronomy, so things like the Hubble – photographs of the Hubble telescope have been great to get students interested. We get interest in astronomy and they come and do science and then they –

they don't stay in astronomy but at least they've (indistinct) subject.

MR JACOBI: I am just interested in picking up on how you communicate to graduates the prospect of them being able to obtain employment in order to encourage them in to courses?

DR ROBERTS: We show the (indistinct) of NTEC students on our website, we can see where the students have got jobs. We're very – in a very good position NTEC that all of our students that want a job in the nuclear industry, get a job in the nuclear industry, so that's an attractive carrot that we can kind of dangle (indistinct) perspective NTEC students. A lot of students we know do engineering programmes will be attracted to other industries which are competing in the same sector. (indistinct) industry is very strong in the (indistinct) community but aerospace industry's got a strong (indistinct) Lots of other technology (indistinct) in the United Kingdom, so we had some (indistinct) really good high quality students. The attraction of getting a job is a very helpful one where we're kind of attracting students to NTEC.

MR JACOBI: I just wanted to come back to something that you said in terms of the proportion of people that in fact need nuclear engineering qualifications. I was just wondering whether you could perhaps offer us a bit of an insight in to what the proportions are that we are really looking at in terms of people that have in fact got nuclear engineering as opposed to those that need to – I guess to have their skills nuclearised to be able to work in the nuclear industry?

PROFESSOR BILLOWES: I think there's a number in John's paper that says nine per cent - - -

DR ROBERTS: Yes.

PROFESSOR BILLOWES: - - - of people on a nuclear power plant site have got nuclear engineering background and 91 per cent don't.

DR ROBERTS: So these are again figures from the nuclear power institute (indistinct) quite a lot of them over the last few years. So the forecast is that you're looking for somebody to operate your reactor, to control the kind of reactivity within the core, these are the kind – the core nuclear engineers. You also need a whole host of (indistinct) engineers to (indistinct) the generation site. You also need a whole host of project managers, accountants et cetera. So nuclear power plant is not 100 per cent nuclear engineers, far from it. You've got a small number which is operating the core reactor within a nuclear power plant. Obviously it's generating electricity, obviously there are buildings being demolished et cetera, so there's lots of other activities on a nuclear power plant (indistinct)

MR JACOBI: Yes. How do you manage their familiarisation? They're people with expert qualifications in their own right that might not have an interest in becoming a nuclear engineer? How is their nuclear familiarisation managed in terms of them being skilled?

DR ROBERTS: There's two general ways. We have – we can either take, as I said, a mechanical engineer or a civil engineer for example and give them the NTEC programme and then they're increased it in to the nuclear engineer industry as a civil or mechanical engineer, or the other way is that industry can recruit civil engineers and then send them on NTEC part time. So at the end of either of those systems you end up with a student who has got core general engineering or science plus a knowledge of a nuclear system as well.

MR JACOBI: Yes. Is an implication of that that the way that one works about building nuclear engineering is essentially to build out from existing competencies in engineering?

DR ROBERTS: Certainly. Yes. When we did an analysis of an audit we created benchmarkings (indistinct) actually with the (indistinct) and a lot of countries will think they are miles away from developing their own (indistinct) nuclear engineering programme but if you look at the curriculum of a nuclear engineering programme it's got a lot of overlap with mechanical engineering and physics. If you match nuclear physics with mechanical engineering, you're pretty close to getting a nuclear engineering (indistinct) and a lot of universities around the world that don't have nuclear power programmes will be teaching things like radiation protection, they'll be teaching things like nuclear medicine and take those attributes and match them to the general engineering programme to develop the nuclear engineering course.

MR JACOBI: Dr Roberts, we've got – in fact, I've read your document Nuclear Engineering Education, the competence based approach and I am just interested in whether for the purposes of the time that we've got now, whether you think that there are any key lessons that we ought draw out of that particular document in terms of your study and analysis of a developing programme to essentially skill a workforce that doesn't – is not necessarily nuclear oriented at the beginning?

DR ROBERTS: There's two programmes socially within that document (indistinct) masters and it goes through the (indistinct) competencies for those – both areas. We need to understand that we need a certain level of student to enable them to kind of gain the qualification nuclear engineering. So it (indistinct) taken me from (indistinct) in class, like every student on that. The important thing I think is to understand the capability of the university. The university has to manage and kind of staff, the planning of that programme and that has to be done in parallel with the other factors affecting nuclear

engineering such as is there government support (indistinct) et cetera. So you're not working in isolation to just develop a nuclear engineering programme, you need to make sure you're working in an atmosphere and environment that's going to be conducive to attracting students to that programme, producing (indistinct) students based on the university capability and giving them job opportunities at the end of that as well.

COMMISSIONER: Gentlemen, that has been very instructive for us and certainly give us plenty to think about. I thank you very much for your time and for the preparation and assistance you have provided us. Enjoy your day.

PROFESSOR BILLOWES: Thank you very much.

DR ROBERTS: Thank you.

COMMISSIONER: We will now adjourn until 09.00 tomorrow morning where we will continue in the theme of Nuclear Education and Skills Development. We will have Dr Addie Paterson from ANSTO.

MATTER ADJOURNED AT 6.08 PM UNTIL
FRIDAY, 4 DECEMBER 2015