17th December 2019

Mr Anthony Hanna
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Legislative Council
Parliament of New South Wales
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Dear Mr Hanna,

**RE: Report on Proceedings Before the Standing Committee on State Development**

Uranium Mining and Nuclear Facilities (Prohibitions) Repeal Bill 2019.

Conducted in the Macquarie Room, Parliament House, Sydney, on Monday 18 November 2019.

Post-hearing responses to Report on Proceedings Before the Standing Committee on State Development.

The Electrical Trades Union was requested to provide responses in relation to two questions on notice as a result of the above matter.

**The first was on page 35 of the transcript from the Hon. Wes Fang. It is reproduced here:**

> ***The Hon. WES FANG:*** *Again, I dispute that. I am happy for you to take this part of the question on notice, but can you provide the research that links the two?*
>
> ***Mr MATT MURPHY:*** *Links what?*
>
> ***The Hon. WES FANG:*** *Links nuclear power with nuclear weaponry?*
>
> ***Mr MATT MURPHY:*** *Does France have nuclear weapons?*
>
> ***The Hon. WES FANG:*** *I am asking you, can you provide—*
>
> ***Mr MATT MURPHY:*** *It is simple. It is as simple as opening your eyes. It is not a question of demonstrating research.*
>
> ***The Hon. WES FANG:*** *You have stated here in your testimony under oath that nuclear power leads to an increase in nuclear weaponry.*
>
> ***Mr MATT MURPHY:*** *I say there is a correlation. I can have it read back to you if you want.*
>
> ***The Hon. WES FANG:*** *Can you provide the evidence of correlation? Thank you.*
>
> ***Mr MATT MURPHY:*** *I can refer you to a map.*

> ***The Hon. WES FANG:*** *I would appreciate if you could take the question on notice and provide it to me. You have said that 250 members at your latest conference voted against supporting nuclear power. You said it was unanimous. All 250 members in unison voted against nuclear power with no dissent?*

I have summarised the question thus:

***"Are there links between nuclear power with nuclear weaponry?"***
***"Can you provide the evidence of correlation?"***

In response, the following table provides a comparative record of those states who have nuclear power generation, possess nuclear weapons, or have nuclear weapons of another nation stored within their borders for the operational use of the other nation.

| **Nations with nuclear energy and nuclear weapons**Serial | Nation | Nuclear energy (operational power reactors)[1] | Nuclear weapons (possession)[2] | Nuclear weapons (present in country through allied party)[3] |
|---|---|---|---|---|
| 1. | Argentina | Yes | No | No |
| 2. | Armenia | Yes | No | No |
| 3. | Belgium | Yes | No | Yes (US) |
| 4. | Brazil | Yes | No | No |
| 5. | Bulgaria | Yes | No | No |
| 6. | Canada | Yes | No | No |
| 7. | China | Yes | Yes | No |
| 8. | Czech Republic | Yes | No | No |
| 9. | Finland | Yes | No | No |
| 10. | France | Yes | Yes | No |
| 11. | Germany | Yes | No | Yes (US) |
| 12. | Hungary | Yes | No | No |
| 13. | India | Yes | Yes | No |
| 14. | Iran | Yes | No | No |
| 15. | Italy | No | No | Yes (US) |
| 16. | Japan | Yes | No | No |
| 17. | Korea, North | No | Yes | No |
| 18. | Korea, South | Yes | No | No |
| 19. | Mexico | Yes | No | No |
| 20. | Netherlands | Yes | No | Yes (US) |
| 21. | Pakistan | Yes | Yes | No |
| 22. | Romania | Yes | No | No |

[1] "World Nuclear Power Reactors & Uranium Requirements". World Nuclear Association. https://www.world-nuclear.org/information-library/facts-and-figures/world-nuclear-power-reactors-and-uranium-requireme.aspx

[2] "World Nuclear Forces, SIPRI yearbook 2019". Stockholm International Peace Research Institute. Stockholm International Peace Research Institute. July 2019. https://sipri.org/yearbook/2019/06/

[3] Kristensen, Hans M.; Korda, Matt (2019-05-04). "United States nuclear forces, 2019". Bulletin of the Atomic Scientists. https://www.tandfonline.com/doi/full/10.1080/00963402.2019.1606503

| | | | | |
|---|---|---|---|---|
| 23. | Russia | Yes | Yes | No |
| 24. | Slovakia | Yes | No | No |
| 25. | Slovenia | Yes | No | No |
| 26. | South Africa | Yes | No | No |
| 27. | Spain | Yes | No | No |
| 28. | Sweden | Yes | No | No |
| 29. | Switzerland | Yes | No | No |
| 30. | Taiwan | Yes | No | No |
| 31. | Turkey | No | No | Yes (US) |
| 32. | Ukraine | Yes | No | No |
| 33. | United Kingdom | Yes | Yes | No |
| 34. | United States | Yes | Yes | No |
| **35.** | **Totals** | **31** | **8** | **5** |

There are 34[4] countries who have either nuclear power generation, nuclear weapons or have another nation's nuclear weapons within their own borders.

Of 31 countries with nuclear power generation, 7 have their own nuclear weapons; North Korea, whose nuclear power generation assets are reportedly decommissioned but who is known to have a significant research capability, does possess nuclear weapons. North Korea is the only nuclear armed state that does not have a declared nuclear power generation capability. In addition, of five nations who have US nuclear weapons deployed within their borders, three have nuclear power generation.

This is far from a statistical correlation but does evidence a connection between nuclear power and nuclear weapons.

**The process**

Both nuclear power and nuclear weapons share several features that include their histories, technologies, skills, workplace health and safety aspects, regulatory matters and radiological research and development.[5]

All the processes at the front of the nuclear fuel cycle, i.e. uranium ore mining, uranium ore milling, uranium ore refining, and U-235 enrichment are still used for both power and military purposes. "The steps of the civilian nuclear energy industry are the same as for the military nuclear industry: from uranium mining to enrichment, from nuclear fuel fabrication to reprocessing. All steps, materials, technology, and equipment are the same. Only one step is missing in the civil nuclear chain, compared to the military chain: production of nuclear weapons themselves. But civil uranium enrichment plants as well as military enrichment plants can produce high enriched uranium: it is the same technology. The same applies for uranium mining: military uranium just looks the same as civil uranium. Nothing different for civil and military reprocessing plants: both use the same technology to separate the plutonium from used nuclear fuel."[6]

The process of enriching uranium to make it into fuel for nuclear power stations is the same as the one used to make nuclear weapons.

[4] Whilst Israel is suspected of having a nuclear weapons programme and operates a reactor at Dimona in the Negev, it maintains a policy of "strategic ambiguity" and neither confirms nor denies the existence of domestic nuclear weapons.

[5] https://cnduk.org/resources/links-nuclear-power-nuclear-weapons/

[6] https://wiseinternational.org/nuclear-monitor/509-510/link-between-nuclear-energy-and-nuclear-weapons

Nuclear reactors are initially fuelled by uranium fuel rods. Uranium is a naturally-occurring element like silver or iron and is mined from the earth. Plutonium is an artificial element created by the process of neutron activation in a reactor. Plutonium is a by-product resulting from the nuclear fuel cycle and is still used to manufacture some types of nuclear weapons.

Some radioactive materials, such as plutonium-239 and uranium-235, will spontaneously fission given the correct circumstances. Inside a warhead, trillions of such fissions occur inside a small space within a fraction of a second, resulting in a massive explosion. Inside a nuclear reactor with control systems, the fissions are slower and less intense, and the resulting heat is used to boil water, to make steam, and to turn turbines which generate electricity.
However, the prime use of plutonium-239 and uranium-235, and the reason they were produced in the first place, is to make nuclear weapons.

**The issues**

The Stockholm International Peace Research Institute (SIPRI) Yearbook 2019 stated: "The raw material for nuclear weapons is fissile material, either highly enriched uranium (HEU) or separated plutonium" and that "All states with a civilian nuclear industry are capable of producing fissile materials."[7]

Some nations promote the expansion of nuclear power, and this influences other countries to plan for their own nuclear power programmes too. There is an extant danger that countries acquiring nuclear power technology may subvert its use to develop a nuclear weapons programme.

Developing nuclear weapons and nuclear power generation is clearly mutually beneficial, and profitable. Value adding a technology is a feature of modern economies. In 2017, scientists from Sussex University in the UK stated that the government is using the Hinkley Point C nuclear power station to subsidise Trident, Britain's nuclear weapons system. "As part of a Parliamentary investigation into the Hinkley project, it emerged that without the billions of pounds ear-marked for building this new power station in Somerset, Trident would be 'unsupportable'. Professor Andy Stirling and Dr Phil Johnstone argued that the nuclear power station will 'maintain a large-scale national base of nuclear-specific skills' essential for maintaining Britain's military nuclear capability."[8]

Another example of the use of civilian nuclear technology for weapons purposes is the production of tritium (the radioactive isotope of hydrogen necessary for multi-stage nuclear weapons) in nuclear reactors.

**Global decline, replacement and proliferation**
In addition, it is worth noting that under the Strategic Offensive Reductions Treaty, thousands of Russian and U.S. nuclear warheads are inactive in stockpiles awaiting processing. The fissile material contained in the warheads is capable of being recycled for use in nuclear reactors.

Nothing in the treaty prevents the fissile material from decommissioned warheads being used in nuclear power reactors (Treaty Between the United States of America and the Russian Federation on Strategic Offensive Reductions, signed May 24, 2002).

Even though the number of nuclear weapons is declining globally, China, Pakistan, India, and North Korea are increasing their warhead inventories.[9] It should be remembered that this decline is largely as a result of Russia and the USA, which together account for over 90 per cent of the world's nuclear

[7] https://sipri.org/yearbook/2019/06/
[8] https://cnduk.org/resources/links-nuclear-power-nuclear-weapons/
[9] https://fas.org/issues/nuclear-weapons/status-world-nuclear-forces/

weapons, reducing their strategic nuclear forces in line with the 2010 Treaty on Measures for the Further Reduction and Limitation of Strategic Offensive Arms (New START) and also making unilateral reductions. However, the pace of their reductions has slowed compared with a decade ago.

At the same time, both Russia and the USA have large scale programmes to replace and modernize their nuclear warheads, missile and aircraft delivery systems, and nuclear weapon production facilities. In 2018 the US Department of Defense set out plans to develop new nuclear weapons and modify others to give them expanded military roles and missions.

This suggests that while the US and Russia are reducing their older weapons systems, they are being replaced with more sophisticated weapons, whilst the smaller nuclear armed, and nuclear powered, nations are increasing their stocks of weapons. This can only be viewed as proliferation and an increasingly unstable version of it.

**Terrorism**

A major objection to establishing a civilian nuclear industry is that the plutonium produced must be carefully guarded against theft by both state and non-state actors. Four kilograms is enough plutonium to produce a nuclear weapon. Disturbingly, it does not have to undergo fission to be effective. Combined with a conventional explosive to produce a "dirty bomb", a small amount would cause unpredictable casualties but extraordinary dislocation if deployed in a major population centre. A minuscule quantity of plutonium breathed into the lungs can cause cancer. If plutonium dust were scattered by even an improvised explosive using ANFO, for example, thousands of people could be affected, and huge areas may be denied to human, social and economic use for extended periods of time.

Other nuclear materials could also be used to make a similarly crude nuclear device.

**Summary**

The many connections between nuclear power and nuclear weapons are clear. The ETU asserts that there is a correlation between nuclear power and nuclear weapons. Many are causal and not coincidental.

On this basis, the notion of more nuclear power stations in the world reasonably and logically suggests more nuclear weapons as a result of the proliferation of materials and technology, the reduction in cost barriers to acquisition, and the security issues inherent in the availability of more nuclear material.

**The second question was on page 35 and 36 of the transcript from the Hon. Mark Latham. It is reproduced here:**

> ***The Hon. MARK LATHAM:*** *What sort of action would the union recommend to stop the systematic retirement of the coal-fired power stations in New South Wales? Is it union policy to rebuild some of these as they close, the old Vales Point, Eraring and so forth?*
>
> ***Mr MATT MURPHY:*** *I am not sure we have a policy to rebuild on those sites, and with the emerging technologies available that we even support that. With your indulgence, if I could recharacterise your question; are we opposed to the construction of new coal power stations. My view is, and I would have to take this one on notice, sure, but I do not believe on the basis of the national secretary's view we would be in opposition to that.*

I have summarised this question thus:

***"What sort of action would the union recommend to stop the systematic retirement of the coal-fired power stations in New South Wales?"***
***"Is it union policy to rebuild some of these as they close, the old Vales Point, Eraring and so forth?"***

I have consulted with the National Secretary, and his response is:

There are a mix of renewable technologies available that are adequate, available and should be pursued.

These include both onshore and offshore wind, ocean tidal and wave, solar, hydro, bioenergy, geothermal and any well-resourced and considered mix of these is able to be supported by battery storage technologies.

In the case of solar and battery storage, these systems are available both locally and remotely to the consumer.

**Conclusion**
I trust that the responses above are acceptable to the Committee and thank the Committee, the support staff and yourself for the invitation to and conduct of the hearing.

Yours sincerely,

Matt Murphy
**National Industry Coordinator**
**Electrical Trades Union of Australia**