

NUCLEAR WEAPONS AND THE CIVILIAN USE OF NUCLEAR ENERGY

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INTRODUCTION

There is no credible case that can be made for the possession, use or threat of use of nuclear weapons. While some skilled in rhetoric may be able to mount an argument in favour of their legality, it is hard to see how these arguments can stand the test of genuine scrutiny.¹ The indiscriminate nature of these weapons, which not only affect the persons targeted but can have ‘lingering after effects’ such as cancer, genetic mutation and environmental destruction on scores of humans well away from the bomb site and which may even seriously damage the human gene pool,² clearly show that anyone who used these weapons would (on today’s standards) very likely commit a Crime Against Humanity or even Genocide.³ The collateral damage associated with the potential failure of the world’s food crops in the event of a nuclear winter would on its own suggest a level of criminality far exceeding the worst excesses ever experienced by humanity thus far.⁴ Anyone contemplating the use of these weapons could not plead ignorance of these likely outcomes in an attempt to escape criminal liability because, as noted by the ICJ in the *Nuclear Weapons Case*,⁵ even in 1987 the *World Commission on the Environmental Development* reported that one nuclear weapon can have a greater explosive power than all explosives used in wars since

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¹ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 326 (‘Dissenting opinion of Judge Weeramantry’).

² Ibid 225.

³ Ibid 295.

⁴ Ibid 235.

⁵ Ibid 232.

the invention of gunpowder.⁶ More destructive energy can be released in the detonation of one modern nuclear weapon than all the energy released by conventional weapons used in all wars throughout history.⁷

Defenders of nuclear weapons have made much of the so-called ‘deterrent’ effect of possessing nuclear weapons but it is unlikely that nuclear weapon states would refrain from using these weapons if their survival was at stake.⁸ Yet the use of nuclear weapons, even as an act of self-defence, if it resulted in massive collateral damage would amount to a war crime or crime against humanity.⁹

While Australia has expressed itself as ‘fully committed to the goal of a world free of nuclear weapons’,¹⁰ it is somewhat duplicitous in this because it claims at the same time to ‘enjoy’ the shield of the US nuclear weapons umbrella. However Australian military strategists are misguided if they seriously believed that the United States would risk the civil, criminal and political consequences of using nuclear weapons on Australia’s behalf. In any event, these military strategists would themselves be exposed to similar sanctions if they ‘aided and abetted’ the use of nuclear weapons. The international community has, on a number of occasions, expressed a commitment to deal with those who would use nuclear weapons in a military exchange and the non-nuclear weapons possessing states have often argued that they are entitled to an ‘unequivocal legally binding assurance’ from nuclear-weapon possessing states that they will never use or threaten to use of

⁶ Ibid.

⁷ Ibid 231. See also, Commonwealth, *Report of the Canberra Commission on the Elimination of Nuclear Weapons*, Canberra, August 1996, <<http://www.dfat.gov.au/publications/security/canberra-commission-report/>>.

⁸ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 316, 329 (‘Dissenting opinion of Judge Weeramantry’).

⁹ See Articles 7(1)(a), 8(2)(b)(iv) of the Rome Statute of the ICC.

¹⁰ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Implementation Action Plan: Report Submitted by Australia*, UN Doc NPT/Conf.2015/PC.1/5 (18 April 2012) 2.

nuclear weapons.¹¹ As all persons using, ordering the use, or being criminally complicit in using nuclear weapons would likely be sentenced to life imprisonment, it is difficult to understand the point in possessing the weapons in the first place.¹²

This article deals with two distinct issues, nuclear weapons and the civilian use of nuclear energy. The legal positions on these two questions are opposite. In the first part of this article the legality and non-proliferation of nuclear weapons is discussed. It is argued that the political and social attitude towards nuclear weapons is changing and the justification for their possession is diminishing. While the majority decision in the *Nuclear Weapons Case*¹³ did not find that the possession or use or threat of use of nuclear weapons was contrary to international law *per se*, the circumstances of how and when they could be used in accordance with international humanitarian law, is so artificial and contrived, that the minority decision, especially that of Judge Weeramantry is the more credible assessment of the law and is relied on in the article as the correct statement of the law. The second part of the article addresses a more complex question, namely the civilian use of nuclear energy which is related to nuclear weapons because weapons grade enriched uranium can be used in both military and civilian applications. For Australia, the implications are significant because of its vast reserves on uranium which means that Australia cannot simply ignore the nuclear issue, but on the contrary it must take a leading role in it. If it does this however, then politically sensitive domestic issues will inevitably surface. How these issues will be resolved remains a complex process.

¹¹ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Chairman's factual Summary*, UN Doc NPT/Conf.2015/PC.1/WP.53 (10 May 2012) 1.

¹² Articles 7(1)(a), 8(2)(b)(iv) of the Rome Statute of the ICC.

¹³ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 226, International Court of Justice (ICJ), 8 July 1996, <<http://www.refworld.org/docid/4b2913d62.html>>.

I NUCLEAR WEAPONS

A *International Humanitarian Law (IHL)*

The use or threat of use of nuclear weapons offends the most basic principles of international humanitarian law in that their use would inevitably be contrary to (1) the principle of proportionality (which prohibits the use of destructive force in excess of that justified for military necessity), (2) the principle of distinction (where no distinction is made between combatants and non-combatants), (3) the principle that prohibits employing arms calculated to cause unnecessary pain and suffering, (4) the principle that prohibits the employment of poisonous weapons, (5) the principle which requires the preservation of hospitals, places of worship, and objects of cultural significance, and (6) the principle which prohibits the unnecessary and disproportionate destruction of the natural environment.¹⁴ In this regard, the Canberra Commission noted that ‘Nuclear weapons have long been understood to be too destructive and non-discriminatory to secure discrete objectives on the battlefield. They came increasingly to be regarded as weapons to be employed only in extremis, and then with the dismaying knowledge that the ensuing consequences would obviate whatever military or political objective prompted their use’.¹⁵

These international humanitarian law prohibitions are not only limited to general principles of customary law but include prohibitions under specific treaties such as the 1925 Gas Protocol¹⁶ or the 1954 Cultural Property Convention.¹⁷ While it is only by a process of strained reasoning that one can reach the conclusion that the use or threat of use of nuclear weapons does not offend international law, the majority decision of International Court of

¹⁴ Ibid 275.

¹⁵ Commonwealth, *Report of the Canberra Commission on the Elimination of Nuclear Weapons*, Canberra, August 1996, 22.

¹⁶ Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare XCIV LNTS (1929) 65-74, referred to in *Nuclear Weapons (Advisory Opinion)*, 287.

¹⁷ *1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict*, 249 UNTS 240-88.

Justice in the *Nuclear Weapons Case* was not prepared to emphatically enunciate illegality in all circumstances.¹⁸ The majority reasoned that because there was no specific treaty or law of custom that prohibited their use or threat of use, they could not conclude that nuclear weapons were illegal.¹⁹ This is a simplistic and blinkered process of jurisprudential reasoning and cynically ignores the effect and operation of international humanitarian law. The threat or use of force by one state against another is specifically prohibited by the UN Charter.²⁰ The notion of totally destroying a city occupied by human beings (even if they are one's enemy) has been considered contrary to the laws of war since time immemorial.²¹ As was noted by Judge Weeramantry's in his dissenting opinion in the *Nuclear Weapons* case, it would come as a surprise to most students of international humanitarian law to realise that while the international community can effectively ban the use of excessively cruel weapons, such as 'cross-bows' and 'dum-dum bullets' they cannot ban the use of a weapon that is capable of destroying the whole of human civilisation.²²

B *History of Attempts to 'ban the bomb'*

While possession of the 'ultimate weapon' would always appeal to the 'dogs of war'²³ the struggle by others to eliminate nuclear weapons has to date been unsuccessful notwithstanding a long and tortuous anti-weapons campaign. After the Second World War, states tried unsuccessfully to achieve 'comprehensive disarmament' with respect to nuclear weapons. During the 'cold war period' numerous attempts were made to implement nuclear arms control pursuant to bilateral agreements, particularly between the US and the

¹⁸ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 211.

¹⁹ *Ibid* 270.

²⁰ *Ibid* 212.

²¹ *Ibid* 277.

²² *Ibid* 263.

²³ Act 3, Scene 1, line 273 of William Shakespeare's *Julius Caesar*: "Cry 'Havoc!', and let slip the dogs of war".

then USSR.²⁴ Notwithstanding these efforts, it was hideously ironic that the more the US and USSR attempted to address the nuclear weapons problem the more each state accumulated more nuclear weapons, so running parallel with bilateral nuclear arms limitation agreements was a nuclear arms race.²⁵

The US and USSR came perilously close to all out nuclear war during the Cuban Missile Crisis of 1962. In the aftermath of this terrifying event it became apparent that the risk of triggering a mutually destructive nuclear war by a misunderstanding or accident had to be addressed. In 1963, a Memorandum of Understanding between the US and USSR was signed to provide for a Direct Communications link between the White House and the Kremlin, known as the 'Hot Line Agreement'.²⁶ This Agreement facilitated a process by which the leaders of the two nuclear powers could effectively communicate with each other during a crisis so as to ensure that a war did not commence by accident.

The Cuban Missile crisis also brought home the realisation that both countries could not recover from a nuclear conflagration. Such a war would bring about their mutual demise. They also began to see that the more nuclear weapons each state possessed the less safe or wealthy they were.²⁷ In turn this led to Strategic Arms Limitations Treaties and ultimately the New START Treaty.²⁸ This treaty process, known as the SALT/START treaties, has been quite effective in reducing the number of nuclear weapons possessed by the US and USSR – later the Russian Federation. In 2010, the US and Russian Federation signed the New Start Treaty which reduced

²⁴ Lisa M Schenck and Robert A Youmans 'From Start to Finish: A Historical Review of Nuclear Arms Control Treaties and Starting Over with the new Start' (2012) 20 *Cardozo J .Int'l & Comp. L.* 399, 436, 401.

²⁵ *Ibid* 402.

²⁶ *Memorandum of Understanding Between The United States of America and The Union of Soviet Socialist Republics Regarding the Establishment of a Direct Communications Link*, signed 20 June 1963 UTS (entered into force 20 June 1963), available from US Department of State, Treaties and Agreements, <<http://www.state.gov/t/isn/4785.htm>>.

²⁷ *Ibid*.

²⁸ *Ibid*.

the number of nuclear weapons to 700, which amounted to a 75 percent reduction in weapons.²⁹

C *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*

While bilateral agreements between the two largest nuclear weapons possessing states were of fundamental importance, these bilateral agreements failed to address the problem of other states acquiring nuclear weapons. The progressive acquisition of nuclear weapons by Britain, France, China, Israel, India, Pakistan and with Iran and North Korea in the process of acquiring them, an even more dangerous and complex situation emerged. The international community was alert to this dangerous complexity at a relatively early stage and commenced negotiation of the *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT). The NPT entered into force in 1970. The NPT amounted to a compact between nuclear weapons possessing states and non-nuclear weapons possessing states, not to transfer weapons or weapons technology to non-nuclear weapons possessing states, with the ultimate goal of achieving nuclear disarmament.³⁰ There are 180 state parties to the NPT and it has been generally been adhered to by those parties.³¹ The biggest problem did not lie with states that ratified the treaty, but those that did not. It was the states that did not ratify the treaty that went on to acquire or develop nuclear weapons.

One important feature of the treaty was a commitment by nuclear weapons states to progress towards ‘complete nuclear disarmament’. Article VI of the treaty committed nuclear weapons possessing states to ‘stop the arms race and ultimately eliminate the weapons altogether’. This important provision has the effect of ‘keeping alive’ international discussion on ‘complete nuclear disarmament’ which could otherwise be buried in the maze of other international discourse if it had not been agreed. In this regard Article VIII (3) of the NPT is also an important provision because it commits parties to

²⁹ Ibid 432.

³⁰ Schenck and Youmans, above n 24, 408.

³¹ Ibid 409.

the treaty to meet every 5 years in order to review the ‘operation of the treaty’.³²

In terms of completely removing the use of all forms of nuclear energy from the Planet, especially for ‘peaceful purposes’, Article IV of the NPT is a major obstacle for those who might aspire to this objective. Article IV (1) enshrines the ‘inalienable right of all parties to the Treaty to develop research, production and use of nuclear energy for peaceful purposes’. If, as a matter of international law, it is an ‘inalienable right’ then one assumes that state parties who might subsequently wish to pursue the cause of complete eradication of the use of nuclear energy for all purposes, including peaceful purposes, would have to deny the right of their opponents to this ‘inalienable right’. As the NPT has been in place for over 40 years and as state parties have consistently reaffirmed this ‘inalienable right’ then it may now even have become part of customary international law.

Had the NPT prohibited the transfer of all forms of nuclear materials and technology for all purposes then states would have had to develop nuclear energy for peaceful purposes relying on their own natural and technological resources. However, the NPT went much further than creating an ‘inalienable right’ to individually research and develop nuclear energy for peaceful purposes, it created the right of states (especially developing states) to collectively fully participate in the exchange of ‘equipment, materials, scientific and technological information for peaceful uses of nuclear energy’³³ and at a discount price.³⁴

This ‘right to share’ nuclear materials and technology for peaceful purposes had the undesirable consequence of enabling delinquent states (and potentially illegal non-state actors) from converting this

³² *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT), signed 1 July 1968, UTS (entered into force 5 March 1970) article VIII (3) (*Non-Proliferation Treaty*).

³³ *Non-Proliferation Treaty* art IV(2).

³⁴ *Non-Proliferation Treaty* art V.

material and technology into nuclear weapons. In an effort to combat this problem states identified those items that would be required to develop nuclear weapons and then included them on a 'trigger list'. From 1971 to 1974, 15 states met in Vienna at a meeting chaired by Professor Zangger of Switzerland where they drew up and published the 'trigger list'. Specifically the 'trigger list' consisted of items, material and equipment that could be diverted from civilian use to weapons use and the members of the group undertook to inform the International Atomic Energy Authority (IAEA) if any items on the trigger list were sent to non-nuclear states.³⁵ This group came to be known as the nuclear suppliers group or the London Club and they reached agreement on the 'trigger list in 1977'.³⁶

The 'trigger list' notification process was backed up by a series of 'safeguards', agreements entered into between supplying/receiving states and the IAEA. More recently a Protocol has been proposed which would operate with states that already have a Safeguard Agreement with the IAEA in order to improve the efficiency of the safeguards system.³⁷ This Protocol is still being negotiated.

D *Comprehensive Nuclear Test Ban Treaty (CNTBT)*

The failure of the international community to declare nuclear weapons illegal has meant that states have had to introduce progressive 'step by step' measures to regulate and control these nuclear devices. As the development of nuclear weapons, necessarily includes testing them, attempts have been made to comprehensively ban the testing of nuclear weapons. Unfortunately a comprehensive ban on testing nuclear weapons has eluded the international community so far. Some progress has been made in this area but generally concessions have only occurred where the testing site is of (a) no practical interest to states with a vested interest in testing,

³⁵ Federation of American Scientists, *Nuclear Non-Proliferation Treaty [NPT] Chronology*, <www.fas.org/nuke/control/npt/chron.htm>, 4.

³⁶ Ibid 7.

³⁷ International Atomic Energy Agency, *Model Protocol Additional to the Agreement(s) between State(s) and the IAEA for the Application of Safeguards (INFCIR/540)*, September 1997, Austria.

such as outer space; or (b) where the effect of testing has met with such opposition from the non-nuclear weapons states, such as atmospheric testing, or testing in pristine areas such as Antarctica or the oceans, that testing states have been forced to compromise; or (c) where geographically adjoining states have successfully concluded a nuclear weapons test free zone – South America and the South Pacific.³⁸ Unfortunately this has not stopped the testing of nuclear weapons because nuclear weapons' testing is still occurring underground.³⁹

The devastating consequences on the human population and environment of atmospheric testing has been known from the outset but was tragically illustrated as a consequence of the US testing nuclear weapons off the Marshall Islands in the Pacific. The genetic effects on babies born after nuclear tests were carried out were hideous. There are reported cases of women giving birth to two headed children and some being born with a syndrome known as 'jellyfish babies' - babies born with no bones and transparent skin where one can see the inner organs of the body.⁴⁰

The Comprehensive Nuclear Test Ban Treaty (CNTBT) has been open for signature for 15 years but it has still not entered into force. The treaty has been signed by 182 states and ratified by 157 states.⁴¹ Australia ratified the CNTBT in July 1998,⁴² and also enacted domestic implementing legislation. Accordingly, so far as Australia is concerned, even though the treaty has not yet entered into force,

³⁸ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 266.

³⁹ On 12 February 2013, North Korea conducted an underground nuclear test.

⁴⁰ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 240-241.

⁴¹ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Comprehensive Nuclear-Test Ban Treaty, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.4, 16 March 2012, 2.

⁴² *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Implementation Action Plan: Report Submitted by Australia*, UN Doc NPT/Conf.2015/PC.1/5 (18 April 2012) 6.

the effect of Australian implementing legislation is such that nuclear weapons testing as envisaged by the CNTBT is domestically prohibited.⁴³ There is also strong support for the CNTBT by non-aligned states who argue that all weapons testing should cease immediately as a practical means of eventually eliminating nuclear weapons altogether.⁴⁴

E *The Problem with Non-state Actors*

Regulating states with respect to nuclear weapons and weapons grade material has proved to be quite difficult but at least states generally comply with international law. Unfortunately the same cannot be said of delinquent non-state actors such as terrorists groups. In the past, only states had the financial and technical ability to acquire nuclear weapons but this is no longer the case and with weapons and weapons grade material now being more widely distributed the danger of delinquent non-state actors obtaining and using these weapons has increased significantly. Since the 1980s states have become more and more concerned about the security of nuclear material that is being transported and which could be stolen by terrorists groups. In 1996 the Canberra Commission noted that: '[t]he possible acquisition by terrorist groups of nuclear weapons or material is a growing threat to the international community. It adds a disturbing new dimension to the more well-established concern about proliferation among states.'⁴⁵ In 1995, Australia enacted the *Weapons of Mass Destruction (Prevention and Proliferation) Act 1995*⁴⁶ which applied to nuclear weapons. This Act created a series of criminal offences for persons who engaged in the proliferation of material such as weapons grade nuclear materials which could be

⁴³ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Implementation Action Plan: Report Submitted by Australia*, UN Doc NPT/Conf.2015/PC.1/5 (18 April 2012) 7.

⁴⁴ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Nuclear Testing – submitted by the Group of non-aligned states*, UN Doc NPT/Conf.2015/PC.1/WP.25, 24 April 2012, 1.

⁴⁵ Commonwealth, *Report of the Canberra Commission on the Elimination of Nuclear Weapons*, Canberra, August 1996, 25.

used by delinquent non-state actors.

In 2003 the US launched the *Proliferation Security Initiative* which called for a global effort to stop the trafficking in weapons of mass destruction from states to non-state actors. Essentially this initiative called upon participating states to ‘interdict’ transfers from states to non-state actors of nuclear weapons and to strengthen information sharing on nefarious activities between states. More than 90 nations have joined the initiative, which amounts to a voluntary non-treaty based arrangement.⁴⁷

The *Global Initiative to Combat Nuclear Terrorism* is in part directed at developing a partnership capacity to combat nuclear terrorism consistent with the *Convention for the Suppression for Acts of Nuclear Terrorism* entered into force in 2007 and requires states to enact appropriate domestic legislation to suppress acts of nuclear terrorism. The *Convention on the Physical Protection of Nuclear Material* entered into force in 1987 and placed a legal obligation on states to protect nuclear material. In the case of both *Conventions*, the IAEA plays a central monitoring role.⁴⁸

The *Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the case of a Nuclear Accident* which entered into force in 1986 and 1987 respectively are not only directed at nuclear accidents but at malicious acts carried out by terrorist groups.⁴⁹

⁴⁷ Schenck and Youmans, above n 24, 431.

⁴⁸ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Physical protection and illicit trafficking, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.6, 16 March 2012, 4.

⁴⁹ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Nuclear Safety, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.5, 16 March 2012, 6.

The Security Council in resolutions 1540 of 2004, 1673 of 2006 and 1877 of 2011 requires all states to establish effective controls over material related to nuclear weapons so as to detect deter and prevent illicit trafficking in nuclear materials or for those materials falling into the hands of terrorists or other subversive groups.

The Vienna Group (which is a group of 10 like-minded states including Australia) has called for states to fully cooperate with the IAEA in order to identify highly enriched uranium supply routes and the provision of nuclear technology in an effort to reduce the risk of this material and technology falling into the hands of delinquent non-state actors.⁵⁰ Another measure directed at enhancing the security of this material and technology is a call by the Vienna group to develop nuclear forensics techniques so as to determine the origin of diverted nuclear material. Nuclear forensics can also assist with the prosecution of persons associated with the illicit trafficking of nuclear materials.⁵¹

In 2012, Australia ratified the *Convention for the Suppression of Acts of Nuclear Terrorism* and implemented national legislation the *Nuclear Terrorism Legislation Amendment Act of 2012* so as to incorporate the treaty into domestic law.⁵²

⁵⁰ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Physical protection and illicit trafficking, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.6, 16 March 2012, 3.

⁵¹ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Physical protection and illicit trafficking, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.6, 16 March 2012, 3.

⁵² *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Implementation Action Plan: Report Submitted by Australia*, UN Doc NPT/Conf.2015/PC.1/5, 18 April 2012, 17.

F *Changing Social Attitudes*

The *Nuclear Weapons Case* attracted world-wide attention and more submissions and petitions were filed in the Court than in any other case to come before the ICJ.⁵³ The time had arrived when states can no longer expect to be able to use nuclear weapons consistent with modern international human rights principles which specifically protect the right to life.⁵⁴ The right of a state to use nuclear weapons – even in defending the state – is no longer part of the social compact.⁵⁵ It is no longer possible to justify possessing a weapon that is capable of wiping out the human species.⁵⁶

The majority of states now oppose possession of nuclear weapons and have frequently supported UN General Assembly resolutions calling for their abolition.⁵⁷ Even some military commanders now publically acknowledge that possession of an expensive weapon that cannot be used in armed conflict is of little practical utility.⁵⁸ Nuclear weapons can no longer be ‘legally used’ in a large part of the planet - Antarctica, Latin America, The Pacific, Africa and outer space.⁵⁹

There is perhaps no better time than now to eliminate them altogether.

⁵³ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 312.

⁵⁴ *Ibid* 266-227.

⁵⁵ *Ibid* 267.

⁵⁶ *Ibid* 226.

⁵⁷ *Ibid* 309.

⁵⁸ IAEA, above n 37, 25.

⁵⁹ *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 226.

II CIVILIAN USE

A *Types of civilian use – medical; power generation; ships and other*

Nuclear energy is the most important energy source on the planet. Nuclear energy powers the Sun. Without nuclear energy life would not exist on earth. Nuclear energy is directly responsible for solar energy and indirectly responsible for wind energy. Although solar nuclear energy is essential for the survival of our environment, it is also very destructive; it causes droughts, floods and cyclonic winds. It is also very dangerous to humans; it can cause death by heat exhaustion, skin cancer and blindness. It is responsible for more premature human deaths than any other energy source but for all of its dangers we simply cannot live without it.

Nuclear energy generated by humans from the controlled use of nuclear fission is very new. Older forms of anthropogenic manufactured energy such as oil, gas and coal have historically had quite damaging consequences for the environment and have caused the premature death of a great many humans beings. The environmental damage through ‘global warming’ caused by the combustion of fossil fuels is likely to be far greater than any damage to the environment that has ever been caused by the generation of power from controlled nuclear fission.⁶⁰

Nuclear energy is used in medicine as a diagnostic aid; X-ray imaging; or as radiopharmaceuticals attached to organic molecules to act as radioactive tracers within the human body. It is also used in industry to measure the thickness and the density of liquids or control the build-up of static electricity in the manufacture of paper, plastics and synthetic textiles. It is used in the oil and gas industry to determine the commercial viability of wells; the road construction industry to determine the density of soils, asphalt and concrete. It is used in the home in smoke detectors, to preserve food and in

⁶⁰ Pushker Kharecha and James Hansen, ‘Coal and gas are far more harmful than nuclear power’ NASA, <<http://climate.nasa.gov/news/903>>.

agriculture as a sterilising agent and importantly it is used to power electricity generators and large ocean going ships. The multiple uses of nuclear energy for peaceful purposes have been consistently recognised and acclaimed by the international community.⁶¹

B *Dangers of Civilian Use*

Handling any form of energy can be dangerous to human beings or damage the environment. The reduction of this risk is a slow learning process. While civilian nuclear accidents have not caused as many deaths or as much environment damage as oil, gas and coal there have nevertheless been some quite troubling nuclear accidents. The complexity of the nuclear process was not understood by the early scientists and many lost their lives during the discovery period. Marie Curie died from aplastic anaemia because she was exposed to high levels of radiation. Radiation exposure also has a long lead time before death occurs. For example many of the deaths from Hiroshima and Nagasaki occurred up to five years after the detonation.

Civilian nuclear fatalities have for the most part been caused by nuclear power plant accidents, generally as a result of nuclear leaks or meltdowns where dangerous nuclear material escapes into environment. The most notorious examples of nuclear power plant accidents are Three Mile Island in Pennsylvania; Chernobyl in the Soviet Ukraine and the March 2011 incident at Fukushima Daiichi, Japan.⁶² The United Nations reported in 1995 that following the Chernobyl explosion, children in the affected area were 285 times more likely to develop thyroid cancer than what was the case before the disaster.⁶³ Radiation poisoning can be equated with the ingestion

⁶¹ For reference to all these uses see *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Cooperation in the peaceful uses of nuclear energy, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.2, 16 March 2012, 2.

⁶² Danielle Demetriou, 'Japan earthquake, tsunami and Fukushima nuclear disaster: 2011 review', *The Telegraph*, 19 December 2011; *Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion)* [1996] ICJ Rep 226.

⁶³ *Ibid* 226.

of other forms of poison but it is often far more serious than other poisons because it can also so cause long lasting genetic damage which effects later generations.⁶⁴

The Fukushima Disaster has led to renewed calls to strengthen nuclear safety by implementing an Action Plan on Nuclear safety that was discussed at a Conference in Japan in December 2012.⁶⁵ The focus of this Conference was the identification of the need to establish 'effective and independent barriers in the national nuclear safety system at the operator, regulator and stakeholder levels' and creating an 'international peer review mechanism for nuclear operators and regulators worldwide' so as to promote 'openness and transparency'.⁶⁶

A feature of the civilian use of nuclear energy (in contrast with its military use) is the potential for operators to be exposed to litigation in the event of negligent mishandling of nuclear power. The international community is alive to the potential for civil liability for nuclear damage and has called for effective liability mechanisms to be put in place to ensure that victims of nuclear damage are paid compensation.⁶⁷ The IAEA Expert group on Nuclear Liability has promoted a Convention based nuclear liability regime to address the issue of civil liability for nuclear damage.⁶⁸

⁶⁴ Ibid.

⁶⁵ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Nuclear Safety, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.5, 16 March 2012, 3.

⁶⁶ The Fukushima Ministerial Conference on Nuclear Safety Fukushima Prefecture, Japan, 15–17 December 2012, *Chairperson Summaries*, Clause 15 of the Report, <http://wwwpub.iaea.org/MTCD/Meetings/PDFplus/2012/20120216/20120216_CSummaries.pdf>.

⁶⁷ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Nuclear Safety, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.5, 16 March 2012, 6.

⁶⁸ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Nuclear Safety, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.5, 16 March 2012, 6.

If the courts can be effective in holding operators accountable for radiation poisoning caused by the negligent mishandling of nuclear energy, then this, coupled with effective international oversight, may produce a level of discipline in the industry which may improve overall safety. In this regard a comparison could be made with the recent improvement of the safety of the pharmaceutical drugs industry.⁶⁹

However addressing nuclear accidents will not deal with the serious problem associated with the disposal of nuclear waste. According to a report from the US National Academy of Sciences, it will take 3 million years for radioactive waste stored in the United States to decay to background levels. There are significant environmental problems associated with disposal which so far have not been adequately addressed.⁷⁰ Nuclear wastes are produced all along the nuclear cycle from mining to milling; from milling to enrichment; from enrichment to reactor core activation; but most wastes are given off from spent fuel rods.⁷¹ A nuclear reactor can generate up to 30 tons of high-level nuclear waste annually and reprocessing nuclear waste (reusing it again) has not proved viable.⁷² There are a number of waste disposal methods but the most successful so far is the vitrification method where nuclear waste is melted with glass and when the glass solidifies the waste is sealed in the glass.⁷³ There is strong support for the argument that no new nuclear power plants should be brought on line until the waste issue has been adequately resolved.⁷⁴

⁶⁹ Susan Thaul, 'How FDA Approves Drugs and Regulates Their Safety and Effectiveness' (Congressional Research Service Report for Congress, 2012), <<http://www.fas.org/sgp/crs/misc/R41983.pdf>>.

⁷⁰ Nicholas Hermes, 'Dangers of Nuclear Waste' on margotbworldnews.com, 4 April 2013, <<http://margotbworldnews.com/WordPress/wp-content/Apr/Apr4/NukeWaste.html>>.

⁷¹ Leslie Lai and Kristen Morrison, 'Nuclear Energy Fact Sheet', *Nuclear Age Peace Foundation*, <<http://www.wagingpeace.org/menu/issues/nuclear-energy-&-waste/nuclear-energy-fact-sheet.php>>.

⁷² *Ibid.*

⁷³ *Ibid.*

⁷⁴ World Nuclear Association, 'Radioactive Wastes - Myths and Realities' (Updated October 2012), <<http://www.world-nuclear.org/info/inf103.html>>.

III AUSTRALIA

A *Australian Reserves*

If Australia had little or no uranium then it would be relatively easy to mount an argument that it would be better off having nothing to do with the nuclear cycle. While there should never be a problem in Australia opposing nuclear weapons, opposing all uses of nuclear energy is more complicated. At the moment, Australia has ample non-nuclear energy resources, such that it is probably uneconomic to use nuclear energy for electric power generation. While Australia needs to reduce CO₂ emissions from coal fired power stations, it can readily do this relying on its abundant resources of natural gas, solar and wind power. The virtue of relying on these alternative energy sources is that they avoid the problem of having to deal with large amounts of nuclear wastes.

Unfortunately Australia cannot avoid becoming involved in the issue of nuclear energy; at least in so far as mining uranium is concerned. Australia has 31 percent of the world's known uranium reserves and future exploration of the vast continent is likely to uncover even more deposits of the energy rich mineral. In 2006 a Parliamentary Committee reported that 'the size of Australia's known uranium resources significantly understates the potential resource base and there is great potential for new and significant discoveries'.⁷⁵ It is clear that Australia has the potential to become the world's largest uranium producer.⁷⁶ The enormity of the Australian reserves dwarfs its competitors by comparison. For example the next largest reserves are in Kazakhstan which has 12 percent, with the Russian Federation and Canada each having 9 percent of the world's reserves. One Australian mine alone, the

⁷⁵ House of Representatives Committee, Parliament of Australia, *Inquiry into Developing Australia's non fossil fuel energy industry*, 4 December 2006, 76, <http://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees?url=isr/uranium/report.htm>.

⁷⁶ Neena Bhandari, *Red Cross Movement Wants Nukes Abolished*, IDN-In Depth News, <<http://www.indepthnews.info/index.php/armaments/602-red-cross-movement-wants-nukes-abolished>>.

Olympic Dam Mine in South Australia contains the largest known uranium ore body on the planet with 26 percent of the world's known reserves.⁷⁷ Australia has four currently operating uranium mines, Ranger in the Northern Territory and with the rest, Beverly, Honeymoon and Olympic Dam in South Australia. South Australia has 75 percent of the country's known reserves of uranium. There are other significant deposits of uranium in Western Australia, and Queensland.⁷⁸

While Australia may have huge reserves of uranium, the size of its reserves is not matched by the level of its production. Australia is the third largest uranium producer after Kazakhstan and Canada, with Kazakhstan producing more than three times the Australian tonnage.⁷⁹ Although the uranium mining industries' contribution to the Australian economy in terms of revenue and employment is not insignificant,⁸⁰ the potential for growth lies in the future. As the devastating consequences of global warming become increasingly apparent the world's thirst for non-fossil based fuels will inevitably increase. Nuclear energy will be part of the solution. Australia's uranium can be recovered at relatively low cost, Australia enjoys political and economic stability and the region most likely to need nuclear energy in the future – Asia – is comparatively close.⁸¹ Uranium is cheaper to ship than coal,⁸² and unlike coal, the location of Australia's major uranium reserves (South Australia and the Northern Territory) allow it to be transported by rail and sea away from sensitive environmental locations such as the Great Barrier Reef.⁸³

⁷⁷ House of Representatives Committee, Parliament of Australia, *Inquiry into Developing Australia's non fossil fuel energy industry*, 4 December 2006, 76, <http://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees?url=isr/uranium/report.htm>.

⁷⁸ World Nuclear Association, 'Australia's Uranium', 14 November 2012, <www.world-nuclear.org/info/inf48.html>.

⁷⁹ World Nuclear Association, 'World Uranium Mining Production Report', August 2012, <<http://www.world-nuclear.org/info/inf23.html>>.

⁸⁰ World Nuclear Association, above n 78, 6.

⁸¹ Ibid.

⁸² Ibid 7.

⁸³ Ibid.

Australia has traditionally taken a conservative approach to the selling of its uranium. Uranium is only exported for peaceful purposes and only to those countries which are prepared to enter into bilateral agreements with Australia not to use the uranium for military purposes. These states must also agree to be subject to the IAEA Safeguards Agreement Scheme. Australia has 22 such agreements in place covering 39 countries and Taiwan. Over 80 percent of Australia's uranium is currently supplied to only four countries – the US, Japan, France and the Republic of Korea.

B *Uranium and Australian Politics*

This conservative approach to the sale of uranium coupled with the relatively slow development of the uranium mining industry is largely attributable to internal political issues within Australia. While the conservative coalition parties have always favoured uranium mining, the Australian Labor Party (ALP) policy has 'waxed and waned' on the issue over the years. In the early 1970s the ALP was committed to establishing a domestic uranium enrichment and nuclear power industry, but after losing office in 1975, pressure grew within the Party to oppose uranium mining. Subsequently the Party (while in opposition) imposed a moratorium on uranium mining. However, when the ALP won office in 1983 this moratorium had been lifted so as to exempt existing mines, on condition that no new mines would be approved. The 'three-mines-policy' applied to the Nabarlek, Ranger and Roxby Downs (Olympic Dam) mines. By 2007 the Party had abandoned the 'three mines policy' altogether.⁸⁴

At the State level, until recently South Australia and the Northern Territory were the only two places in Australia where the mining of uranium could be carried out legally. In NSW the *Uranium Mining and Nuclear Facilities (Prohibition Act 1986)* prohibited the mining for uranium, and the construction or operation of nuclear reactors

⁸⁴ Adapted from Senator Chris Evans' speech 23 March 2007 to Labor Business Roundtable, Perth Australia.

and other facilities in the nuclear fuel cycle. This Act was repealed in 2012. In Victoria the *Nuclear Activities (Prohibitions) Act 1983* also prohibited uranium mining and enrichment. This Act is still in force. In Queensland, uranium mining had been prohibited since the closure of the Mary Kathleen mine in 1982, however, the Queensland Government reversed this policy in 2012. There are more than 80 known sites that contain valuable amounts of uranium in Queensland, mostly in the state's north-west. In Western Australia uranium mining was prohibited until October 2012 when the State Government approved a uranium mine at Wiluna.⁸⁵

The opposition to uranium mining in Australia was only likely to survive at a main stream political level while market conditions for uranium energy remained subdued. This situation may now be changing and with renewed pressure mounting because of climate change, the prospect of a reinvigorated uranium mining industry is a strong possibility. In any event, it is unlikely that Australia could resist international market pressure to supply uranium if the demand for non-fossil fuels increased significantly. These market driven forces must also be coupled with Australia's international treaty obligations. As noted above, Article IV of the NPT specifically incorporates the 'inalienable right of all the Parties...to develop research, production and use of nuclear energy for peaceful purposes without discrimination' and perhaps more significantly imposes an obligation on Parties...in a position to do so...to co-operate in contributing...to the further development of the applications of nuclear energy for peaceful purposes, especially in the territories of non-nuclear-weapon States...with due consideration for the needs of the developing areas of the world'.

Similarly, Article V of the NPT imposes an obligation on Parties to 'take appropriate measures to ensure that...the potential benefits from any peaceful applications...will be made available to non-nuclear-weapon States on a non-discriminatory basis and at the

⁸⁵ 'First WA uranium mine a step closer', *ABC* (online), 10 October 2012, <<http://www.abc.net.au/news/2012-10-10/uranium-mine-in-wa-a-step-closer/4305906>>.

lowest possible cost'. Further Australia, as a Member of the Nuclear Suppliers Group has consistently supported the NPT principle that it has an obligation to facilitate access to nuclear material for peaceful purposes. In the 2012 Working Paper on Peaceful Uses of Nuclear Energy, Australia, as a member of the Vienna Group expressly reiterated its support for this principle. It has also expressed itself as being willing to share its civilian nuclear technology with countries in the Asia Pacific Region.⁸⁶

Having all this uranium and being under an obligation to sell it creates an exquisitely complex problem for Australia if it genuinely wants to pursue a policy of eliminating nuclear weapons. While bilateral agreements with buying states may help, they will not completely remove the risk of buying states (or worse non-state actors) converting Australian uranium into weapons grade material. Uranium supplied from Australia mines is unenriched. This raw material is then enriched in the buying country. It can be low enriched for civilian nuclear power plant reactors, or highly enriched, which could be used for civilian purposes but it also makes it suitable for nuclear weapons. The solution may lie in Australia enriching its uranium before sale and then only producing low enriched nuclear material. While low enriched material could perhaps be converted to highly enriched material, the cost differential may deter purchasers from buying expensive low enriched materials that then has to be further enriched.

IV WEAPONS GRADE VS LOW GRADE ENRICHMENT

A *International Position on Low Grade Conversion*

The international community has long been committed to a program

⁸⁶ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Implementation Action Plan Report Submitted by Australia*, UN Doc NPT/Conf.2015/PC.1/5, 18 April 2012, 16.

of converting nuclear reactors from those that must use highly enriched uranium (also required for nuclear weapons) to those that can function on low enriched uranium (unsuitable for nuclear weapons). Today very few research reactors still operate on highly enriched uranium. Some highly enriched uranium is still needed for scientific research, but extensive stocks of this material is held by the nuclear weapons possessing states and they could meet this demand without the need to produce any more highly enriched material. Hence a prohibition on the production of all weapons grade material may be a possibility and could prove helpful in eliminating the proliferation of nuclear weapons.⁸⁷

In 1977, the Nuclear Suppliers Group called for a ban on developing any new nuclear reactors that relied on highly enriched uranium for its operation. In 2010, the Nuclear Security Summit supported international efforts to minimise and eventually eliminate the use of highly enriched uranium in the civilian sector and the US through its Global Threat Reduction Initiative is working with other states in order to convert their research reactors to low enriched facilities. In Romania and Uzbekistan this conversion process was achieved with the provision of financial aid and technical support from both the US and the Russian Federation. At the moment there are no mandatory regimes in place to monitor highly enriched uranium stockpiles available for civilian use but a *Model Safeguards Protocol* has been drafted which specifically seeks to track the storage location and conversion of 'weapons grade uranium'.⁸⁸

The ongoing international dispute with Iran is based on the fact that Iran's stockpile of weapons grade materials makes it implausible that Iran could need all of this highly enriched material solely for

⁸⁷ Commonwealth, *Report of the Canberra Commission on the Elimination of Nuclear Weapons*, Canberra, August 1996, 91.

⁸⁸ International Atomic Energy Agency, *Model Protocol Additional to the Agreement(s) between State(s) and the IAEA for the Application of Safeguards* (INFCIR/540), September 1997, Austria, art. 2(viii).

peaceful purposes.⁸⁹ The United Nations General Assembly has consistently called for a ban on the further production of weapons grade material and has fully endorsed the adoption of a ‘fissile material cut-off treaty’.⁹⁰

B *Australia’s Position on Low Grade Enrichment*

Australia as member of the Non-Proliferation and Disarmament Initiative has long supported a ‘fissile material cut-off treaty’ and co-hosted (with Japan) the Conference to launch negotiations for this treaty. The position taken by Australia is consistent with the Initiative’s objective of achieving a nuclear weapons free world.⁹¹

In partnership with Argentina, Australia is developing the capacity to become a commercial producer of low enriched uranium with emphasis on the need to ensure that low enriched uranium can effectively be used in medical applications.⁹² In doing this, Australia operates a diagnostic laboratory which is part of the IAEA network of analytical laboratories.⁹³ While Australia has consistently supported other states in the development of their civilian nuclear

⁸⁹ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Report Submitted by Canada*, UN Doc NPT/Conf.2015/PC.1/9, 3 May 2012, 2.

⁹⁰ UN General Assembly Resolution 66/44, see *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Fissile Material cut-off treaty, Working Paper submitted by the Non-Proliferation and Disarmament Initiative*, UN Doc NPT/Conf.2015/PC.1/WP.2, 17 March 2012, 1.

⁹¹ JC Suresh, *Group of 10 Pleads for a Nuke free World*, IDN-In Depth News, <www.indepthnews.info/index.php/global-issues/1186-group-of-10-pleads-for-a-nuke-free-world>.

⁹² *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Implementation of Action Plan 2nd Symposium on the Minimization of Highly Enriched Uranium, Working Paper submitted by Austria and Norway*, UN Doc NPT/Conf.2015/PC.1/WP.1, 15 March 2012, 4.

⁹³ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Implementation Action Plan Report Submitted by Australia*, UN Doc NPT/Conf.2015/PC.1/5, 18 April 2012, 14.

energy programs it has done so in the context of ensuring that states have a stable domestic regulatory framework under the supervision of the IAEA so as to ensure the safety and security of nuclear material.⁹⁴

Australia generally enjoys a good reputation for security of its nuclear material,⁹⁵ and no longer uses highly enriched uranium in its research reactor. In conjunction with its research program Australia hopes to become a 'nil-user' of highly enriched uranium by developing medical and industrial radioisotopes which are no longer dependant on highly enriched uranium.⁹⁶ In pursuing these objectives Australia has always worked closely with the IAEA and sees close cooperation with the IAEA as a means of ensuring independent verification of the security of its nuclear material.

C *Fuel Banks and the IAEA*

In 1946, the US proposed a plan to place all the world's nuclear resources, mining, manufacture, enrichment and weapons under the exclusive control of the IADP (the forerunner to the IAEA); unfortunately for the international community, the USSR (the only other nuclear power at the time) refused to agree to the proposal.⁹⁷ However, the idea of having the IAEA at the centre of nuclear process has never really gone away and has progressed to the point where it actually now becomes a party to international treaties focused on implementing nuclear safeguards.⁹⁸ The IAEA is for

⁹⁴ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Nuclear Safety, Working Paper submitted by the Vienna Group of Ten*, UN Doc NPT/Conf.2015/PC.1/WP.5, 16 March 2012, 1.

⁹⁵ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Implementation Action Plan Report Submitted by Australia*, UN Doc NPT/Conf.2015/PC.1/5, 18 April 2012, 16.

⁹⁶ *Ibid* 21.

⁹⁷ Schenck and Youmans, above n 24, 403.

⁹⁸ International Atomic Energy Agency, *Model Protocol Additional to the Agreement(s) between State(s) and the IAEA for the Application of Safeguards* (INFCIR/540), September 1997, Austria.

many states seen as an ‘honest broker’ and as crucial in providing developing countries with enhanced access to civilian use nuclear technology and financing.⁹⁹

The IAEA also plays an important role by assisting states with the conversion their research reactors from highly enriched uranium reactors to low enriched reactors.¹⁰⁰ As part of this program the need to assure states that they will have access to reliable supplies of low enriched uranium in the future is essential. In this regard, the IAEA is seen by many countries as having a central role in overseeing the operation of low enriched uranium fuel banks which could guarantee supply for peaceful purposes while at the same time monitoring the use and storage of low grade fuel.¹⁰¹ To this end Kazakhstan has now decided to host a low enriched uranium bank under the auspices of the IAEA.¹⁰²

V CONCLUSION

As Australia has the world’s largest known reserves of uranium it is incumbent on it to take a leading role in the processing and storage of low enriched uranium. The country should no longer limit itself to the export of ‘yellowcake’ but should establish a commercial low

⁹⁹ Federation of American Scientists, *Nuclear Non-Proliferation Treaty [NPT] Chronology*, 4th NPT Review conference in Geneva 1990, <www.fas.org/nuke/control/npt/chron.htm>, 14.

¹⁰⁰ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Implementation of Action Plan 2nd Symposium on the Minimization of Highly Enriched Uranium, Working Paper submitted by Austria and Norway*, UN Doc NPT/Conf.2015/PC.1/WP.1, 15 March 2012, 5.

¹⁰¹ *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons – Implementation of Action Plan 2nd Symposium on the Minimization of Highly Enriched Uranium, Working Paper submitted by Austria and Norway*, UN Doc NPT/Conf.2015/PC.1/WP.1, 15 March 2012, 6..

¹⁰² *Preparatory Committee for the 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Chairman’s factual Summary*, UN Doc NPT/Conf.2015/PC.1/WP.53, 10 May 2012, 13.

enrichment facility with the ultimate objective of only supplying the world with low enriched uranium. The facility and all aspects of processing, transportation and sale should be under the direct supervision of the IAEA. Australia should enter into a bi-lateral treaty with the IAEA to cover all aspects of this arrangement. While this would require the cooperation of the mining companies, nuclear material is far too dangerous to be part of a faint hearted process in deciding how it should be handled.

While important measures need to be put in place at the top end of the cycle (mining, processing and sale), of equal importance is what should be done at the bottom end (disposal of nuclear waste). As a matter of international politics Australia cannot afford to potentially make huge profits from the sale of its uranium but ignore what happens once its uranium is spent. Australia has an obligation to take back nuclear waste that has been given off from the use of its uranium. Australia should develop suitable waste storage facilities to store nuclear waste. As the location of any waste facility is likely to cause considerable political controversy – ‘not in my backyard’ – the waste could perhaps be returned to storage facilities located on or near the mining leases from where the uranium was originally extracted. These are hard issues but are essential for the preservation of the planet; Australia must take a leading role.