



**September 2005**

**Proliferation – where civil and military nuclear ambitions form a critical mass**

**Summary:**

Greenpeace opposes nuclear power not only because it is an expensive and hazardous way to produce electricity but also because it is also a key way for countries to gain access to the technology and materials needed to develop nuclear weapons.

The majority of technologies and materials used across the whole civil nuclear industry, whether it in large power or small research reactors, uranium enrichment plants and reprocessing facilities or hot cells can all be used as components in a nuclear weapons programme.

Because of this the push to spread nuclear power – particularly to mitigate against climate change – would lead to the potential for nuclear weapons proliferation on a massive scale. The International Panel on Climate Change, in discussing a global nuclear programme big enough to help offset climate change described the problems as ‘presenting a security nightmare.’

The knowledge, technology and materials necessary for civil nuclear programmes equips countries with the ability to develop nuclear weapons – making these states ‘nuclear weapons capable.’

Conversely, the nuclear power programmes in the five ‘official’ nuclear weapons states (China, France, Russia, the UK and the US) started from their military nuclear industries seeking to establish a civil role which they believed would legitimise their activities in the weapons field.

The act of acquiring nuclear weapons – whether directly through military or indirectly through civilian programmes - has proven to be a very powerful incentive for others to attempt to gain nuclear weapons. This is what we term nuclear proliferation. This briefing gives an overview of the combination of technological and political issues which has led to, and continues to feed, nuclear proliferation internationally.

**The technology and the materials**

The majority of nuclear technology used in civil nuclear power programmes can be used in the production of weapons usable nuclear materials.

- Uranium enrichment in a nuclear enrichment plant facility can produce uranium at a grade for use in reactor fuel or make weapons-grade uranium.
- A nuclear reactor can be used to ‘burn’ uranium in such a way to maximise the creation of plutonium for bombs. The Calder Hall and Chapelcross reactors in the

UK were used to make plutonium for nuclear weapons (Chapelcross was also used to make Tritium which is used as a trigger in nuclear weapons).<sup>1</sup>

- Research reactors e.g. a 20 megawatt research plant, can also be used to make materials for nuclear weapons.<sup>2</sup>
- Weapons-usable plutonium is separated out from spent fuel in large scale reprocessing plants, like Sellafield in Cumbria and La Hague in Brittany (link reprocessing page). These large facilities have massive lead-lined rooms called 'hot' cells in which spent fuel is dissolved the plutonium and uranium separated out from highly radioactive fission products. Plutonium can also be separated out – although more slowly and in more hazardous conditions – in the smaller hot cells attached to research reactor facilities.<sup>3</sup>
- The plutonium when separated is weapons-usable, but can be further refined to make it weapons grade.

Sometimes countries will gain large amount of the necessary technology and materials for a civil programme through legitimate means, then gain the skills for an illicit programme through clandestine measures. This combination of legal and illegal gathering of materials and technology has been used in a number of countries for their weapons programme.<sup>4</sup>

## The politics and the treaties

There are two main systems/treaties which combine to form an overarching framework for both the control *and* distribution for nuclear technology and materials. These are the statutes and safeguards agreements of the International Atomic Energy Agency (IAEA) and the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

### What do they do?

The IAEA remit calls on it to:

- promote the peaceful use of nuclear technology/materials/energy;
- encourage uniformity in safety across a range of nuclear activities – from reactor operation to waste transport; and
- operate the nuclear materials safeguards system which is meant to prevent the misuse of materials designated for civil use in military programmes

(The Euratom Treaty which covers all EU member states reflects the IAEA's remit). The IAEA's main statute is supplemented by many different treaties, agreements and guidelines.

The NPT:

- recognises five official nuclear weapons states - China, France, Russia, the UK and the US – which under the Treaty are legally obliged to pursue complete disarmament; and

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<sup>1</sup> See Ministry of Defence [http://www.mod.uk/publications/nuclear\\_weapons/accounting.htm](http://www.mod.uk/publications/nuclear_weapons/accounting.htm). Calder Hall and Chapelcross reactors are now all shut-down.

<sup>2</sup> For an example, see the Federation of American Scientists on <http://www.fas.org/nuke/guide/serbia/nuke/>

<sup>3</sup> See Bulletin of Atomic Scientists on [http://www.thebulletin.org/article.php?art\\_ofn=so94albright](http://www.thebulletin.org/article.php?art_ofn=so94albright)

<sup>4</sup> For an example 'Nuclear Wastelands' (International Physicians for the Prevention of Nuclear War and Institute for Energy and Environmental Research, 1995 on India's nuclear programme. ISBN 0-262-13307-5)

- allows all non-nuclear weapons states the right to access nuclear technology and materials for peaceful purposes: an essential part of the bargain to get states to sign up to the Treaty. It bestows on non-nuclear weapons states the right to acquire the same nuclear materials and technology which are needed for weapons development

Due to the conflict of interests contained within the IAEA's remit and the 'bargain' of the NPT there are many problems in enforcing these treaties and agreements.

- The IAEA objective of spreading peaceful nuclear power - at the same as attempting to prevent the spread of nuclear weapons- has encountered many problems. For example, the IAEA safeguards programme centres on controlling the materials (uranium and plutonium) used in nuclear reactors and nuclear weapons. It was initially it was believed that controlling these materials would effectively prevent the development of nuclear weapons through civil nuclear programmes. This has proven not to be the case, as the control of the technology to enrich uranium or produce plutonium has also been shown to be key in reducing the risk of proliferation as controlling materials alone is not enough.
- In recent years attempts have therefore been made tighten up on technology transfer and not leave the system of proliferation control mainly reliant on restricting access to nuclear material. Some technology transfer is already controlled, to differing degrees of success, through bilateral and multilateral agreements between Governments and the IAEA. Strange though it may seem, despite the problems exposed through technology transfer, a number of nuclear export controls are only undertaken on a voluntary – not a legally - mandated basis.
- The above exposes the problem in having the IAEA promote the use of nuclear power when the materials and technologies involved are vital to form the basis of nuclear weapons programme.<sup>5</sup>
- The safeguards programme is legally enforceable under international agreements, and is expected to be honoured by all states which are signatories to the NPT. Unfortunately a number of countries have found a number of ways to resist implementation of safeguards agreements. Others have blatantly flouted the agreements. So, although there are legal measures they are often not enforceable.
- The last measure the IAEA can take to enforce safeguard is by recourse to the UN Security Council. The five permanent members of the UNSC are the nuclear weapons states which often veto plans to impose safeguards on recalcitrant countries. In fact the weapons states have often been culpable in helping to aid proliferation. Some of them have traded nuclear materials and technologies with each other (which is questionable under the NPT<sup>6</sup>), and they have often turned a blind eye to companies based in their country which have broken IAEA rules.

### **Who is allowed to do what?**

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<sup>5</sup> Paper discussing Japan and proliferation East Asia:  
<http://www.oxfordresearchgroup.org.uk/publications/briefings/Japanreport.pdf>

<sup>6</sup> See news on legal opinion challenging the US-UK Mutual Defence Agreement as being in breach of the NPT:  
<http://www.acronym.org.uk/dd/dd78/78news02.htm>

As noted already, there are five internationally recognised nuclear weapons states (China, France, Russia, UK and US) under the Non-Proliferation Treaty (NPT). There are also the three unofficial weapons states of Israel, India and Pakistan (not signatories to the NPT).

In addition to the 'official' and 'unofficial' nuclear weapons states there are countries which, it is claimed, are developing nuclear weapons (e.g. Iran and North Korea), under the guise of their nuclear power programmes. These so-called rogue states are not alone in their potential to develop nuclear weapons.

Including those countries named above the Comprehensive Test Ban Treaty (CTBT) requires the signatures of 44 countries in total because these are all regarded as 'nuclear capable' – because they have either significant holdings of nuclear material and/or nuclear technology<sup>7</sup>

The situation in some of these nuclear-capable states has given rise to concerns that if the political situation seriously deteriorates then previously civil programmes could – within a short space of time – be deployed to quickly develop or construct nuclear weapons.

In many instances it appears the transfer of nuclear material and technology between states has been as conditional on political and military alliances as on the actual limitations and objectives of the agreements and treaties. Weapons states have allowed questionable transfers of technology to non-weapons states.

The seemingly arbitrary nature of the nuclear trade has allowed some countries to favour others by giving them certain nuclear technologies, whilst at the same time refusing similar transfers to other nations.<sup>8</sup>

This discrimination has led those being denied to claim they are being treated unfairly under what they claim are their universal rights to access technology and materials for civil programmes under international agreements e.g. the NPT.

The confusion over what is or is not allowed, who gets what (depending on political alliances) has been dubbed nuclear apartheid and is at the centre of some of the manoeuvring between the weapons and non-weapon states. (see NW article).

It's no secret, for example, that weapons-usable materials have been traded between weapon and non-weapon states under what is claimed to be a civil programme – others would claim it is the guise for a military programme. It's been said one country's nuclear power programme is another's fledgling nuclear weapons programme – this being purely dependent on the political perspective of the commentator. This highlights the very real problem that even the *perception* of proliferation can bring with it serious political problems. It's not hard to imagine how a massively expanded programme of nuclear reactors across the world would seriously exacerbate the already fraught political dynamic of the international nuclear non-proliferation regime.

## Summary

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<sup>7</sup> See <http://www.armscontrol.org/pdf/ctbtsigs.pdf> for a full list of countries that have to sign and ratify the CTBT).

<sup>8</sup> 'Nuclear Double Standards', New Scientist, 10<sup>th</sup> July 2004 reporting on speech by Dr ElBaradei, Director General of the IAEA to the Carnegie International Non-Proliferation Conference in Washington, June 2004.

Proliferation has then comes about - and continues - because of political and practical activities:

- The IAEA and NPT help spread the wherewithal for nuclear weapons through transfers of nuclear materials and technologies;
- The weapons state encourage, incite and justify non-weapons states acquiring nuclear weapons through their claims that nuclear weapons give them political power; through using their nuclear weapons to back up conventional military activities and by claiming the nuclear weapons keep their countries safe; and
- Nuclear weapon states – in particular the US and UK - have recently compounded these problems by either announcing programmes for new weapons development or replacement programmes e.g. the Government's possible decision to replace the Trident missile programme.