Nuclear Power and Antiterrorism: Obscuring the Policy Contradictions[1]

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ABSTRACT *Some governments are promoting both nuclear power and antiterrorism, but without much attention to connections between the two issues. Nuclear power increases the risk of nuclear terrorism directly and via nuclear proliferation, but this is seldom mentioned by policy-makers. Governments use a set of rhetorical moves to hide the tensions in their policies concerning nuclear power and terrorism.*

Keywords: nuclear power; terrorism; nuclear weapons; technological vulnerability.

Introduction

Two contentious issues have been prominent on the agendas of Western governments for several years: terrorism and global warming. The debates on these issues have largely been independent. In particular, one point of intersection has received surprisingly little attention: nuclear terrorism.

Some politicians in Australia and the United States, among other countries, have promoted nuclear power, citing it as a solution to global warming. For example, US President George W. Bush says nuclear power is 'economical, environmentally friendly and safe' and the way to overcome dependence on foreign oil. Australian Prime Minister John Howard says nuclear power is 'a very important part of the solution' to global warming.[2] Yet the expansion of nuclear power is bound to lead to an increased risk of nuclear terrorism, though the amount of increase is debateable. Those who argue for nuclear power as a response to global warming almost never raise, in this context, the issue of nuclear terrorism, though antiterrorism has long been a theme in their policy and rhetoric, and a central one since 9/11. The question thus arises, why has the terrorism risk from nuclear power received so little attention?

In the following sections, I first outline the main issues concerning nuclear terrorism. Then I discuss contradictions in government policy and practice concerning nuclear power and terrorism. After this, I examine features of

government rhetoric, including underlying assumptions. In the conclusion I summarise the analysis.

Nuclear Terrorism

Nuclear terrorism is the use of nuclear materials for the purpose of terrorism. The most commonly cited example is the possibility of a terrorist organisation such as al Qaeda obtaining a ready-made nuclear weapon or building one itself. There are tens of thousands of nuclear weapons in the world today, the bulk of them in the arsenals of the United States and Russia, with smaller numbers in China, France, Britain, Israel, India, Pakistan and North Korea. It is possible these weapons might be stolen or purchased by terrorist groups. Much attention has been focused on the lack of security of weapons in Russia, where economic collapse means less money for protection and more incentive for illicit use.[3]

Instead of obtaining a ready-made weapon, a terrorist group might also build a nuclear device, for which the key element is fissile material, either plutonium or highly enriched uranium. Another option is to obtain radioactive materials, such as spent fuel rods from a nuclear reactor, and disperse them using a conventional explosive. Even with relatively little radioactive material, such a 'dirty' bomb could cause panic and evacuations, thus serving as a 'weapon of mass disruption'. A more subtle approach would be to put plutonium oxide into the air conditioning intake of a large office block, exposing workers to lethal intakes: a millionth of a gram lodged in a person's lung can cause lung cancer.

Terrorism can be thought of as communication amplified by violence: the ultimate targets of terrorism are less the victims than the audiences of the violence.[4] Violence without publicity is ineffectual for striking terror into third parties. The Western news media play a crucial role in publicising violence and hence in making terrorism so effective. This helps explain why the combination of 'nuclear' and 'terrorism' is so potent. Ever since the 1945 bombings of Hiroshima and Nagasaki, nuclear technology has been the subject of a special dread, amplified through the efforts of anti-nuclear movements. Nuclear weapons are seen as qualitatively different from other weapons, despite the efforts of militaries to blur the distinction through the development of mini-nukes and the failed efforts of nuclear proponents to normalise nuclear explosives by proposing them for civilian purposes such as dredging harbours.

From the beginning, proponents of nuclear power have sought to separate their enterprise from military uses of nuclear technology, for example in President Eisenhower's 'atoms for peace' programme. Yet there have always been connections between nuclear power and nuclear weapons. Strictly speaking, 'nuclear power' refers to the production of electricity through a nuclear chain reaction in a power plant, but to achieve this requires several other stages in what is called the nuclear fuel cycle: uranium mining and processing; uranium enrichment; reprocessing; and waste disposal. Several of these stages allow diversion of nuclear materials for military purposes.

For most conventional nuclear power plants, uranium needs to be enriched from 0.7% U-235 to about 2 or 3%. But enrichment facilities, once constructed, can easily be used to further enrich the uranium to 90% U-235, suitable for constructing a bomb. The other way to make a bomb is using plutonium. As the atoms of U-235 in a nuclear reactor split apart, releasing heat, some of the resulting neutrons are absorbed by atoms of U-238—the main isotope—resulting in Pu-239,

the main isotope of plutonium, which can also be used to construct a nuclear weapon. The bomb dropped on Hiroshima was constructed from enriched uranium; the one dropped on Nagasaki three days later was made from plutonium.

To make a bomb from plutonium, Pu-239 has to be extracted from the reactor fuel rods. This occurs at a stage in the nuclear fuel cycle called reprocessing, which chemically separates uranium, plutonium and fission products such as strontium-90. If fuel rods are reprocessed after only a short time in a reactor, the plutonium is relatively pure and easier to make into an explosive.

Several governments have obtained nuclear weapons by using nuclear facilities designed for peaceful purposes, most commonly by reprocessing nuclear fuel from a research reactor. The Indian government produced its 1974 nuclear explosive using material from a Canadian-designed research reactor. Fissile material for Israeli nuclear weapons is presumed to come from a reactor built with French government assistance. Pakistani bomb makers relied on industrial espionage at a civil European uranium enrichment plant.

Non-state terrorists have several options for obtaining nuclear materials: they can steal them; they can purchase them; they can obtain them by extortion, for example by threatening to kill or torture an employee's family; or they might be given them by sympathetic workers or governments.

Another option, probably much easier, is to attack existing nuclear facilities, which contain vast quantities of plutonium and fission products. One possibility is to fly a large jet into a nuclear power plant. Another is to invade or infiltrate a plant and intentionally cause a nuclear meltdown. A softer target is spent fuel, often stored in cooling ponds on site, with little protection. The total long-lived radioactivity in a single plant's spent fuel is much larger than that released in a nuclear explosion. The most fearsome threat would be bombing of a major reprocessing plant, releasing huge quantities of radioactive materials, contaminating large areas for centuries.[5]

Currently there are over 400 nuclear power plants in the world, plus several major reprocessing plants. In order for nuclear power to become a major contributor to world energy supplies, many thousands of plants would have to be built. If reprocessing became widespread, this would result in the 'plutonium economy', with circulation of thousands of tonnes of plutonium. In such a scenario, nuclear terrorism is bound to be a major risk.

Contradictions in Practice

There are several serious contradictions in government policies and practices concerning the intersection of nuclear power and antiterrorism: ways to reduce nuclear risks are not being pursued; anti-proliferation efforts have serious gaps; protection of nuclear facilities against terrorist attack is less than ideal; and antiterrorism has little apparent impact on technological choice.

Nuclear Risks

Nuclear power is a complicated and potentially highly dangerous operation, not just because of terrorist threats. A nuclear meltdown accident could lead to the release of vast quantities of radiation, with long-lasting health and environmental effects. The 1986 Chernobyl accident killed a few dozen people due to immediate effects. The long-term health effects are debated, but could amount to tens of thousands of additional cancer deaths.

Furthermore, nuclear plants are potential targets in war. For example, during the Iraq–Iran war in the 1980s, each side targeted the opponent's nuclear facilities. A nuclear strike on a nuclear plant or, even worse, a reprocessing plant, would multiply the radiation effects by a large factor.

These risks have been known for decades. The most famous study of the effects of a nuclear accident, the Rasmussen report, was published in 1974. Bennett Ramberg's key book, *Destruction of Nuclear Energy Facilities in War,* was published in 1980.[6] Warnings about criminal and terrorist threats to nuclear facilities—and the civil liberties consequences of dealing with them—appeared in the 1970s.[7]

Given this background, an obvious response would be to make nuclear power much safer. Options abound, for example building plants in smaller sizes in remote locations[8] or using the thorium cycle, that reduce the hazards of nuclear accidents. Yet these options have not been adopted. Nuclear facilities continue to be built in much the same way they have been for decades. A key reason is cost: building small remote nuclear plants would be expensive, and commercialising the thorium cycle would require many years of costly development.

Making nuclear power plants safer would undoubtedly reduce the risk of terrorism, as well as the risk of accidents. The policy contradiction is that despite concerns about terrorism, these steps have not been taken.

Proliferation

The risk of proliferation has been well known for decades. In 1976, Australia's Ranger Uranium Environmental Inquiry stated that, 'The nuclear power industry is unintentionally contributing to an increased risk of nuclear war. This is the most serious hazard associated with the industry'.[9] But this warning seems to have had little lasting effect on Australian government policy on uranium export. When export policy was originally announced in the late 1970s, it had a number of anti-proliferation safeguards, but over the years these have been watered down in the search for sales.[10] There is now little to prevent Australian uranium being used in nuclear weapons built in other countries.

The Non-Proliferation Treaty, which has been the centrepiece of diplomatic efforts to prevent proliferation, was founded on a contradiction: it forbids non-weapons signatories from developing nuclear weapons while promoting nuclear power, which lays the basis for nuclear weapons capabilities. The NPT was built on a bargain: non-nuclear states would forgo nuclear weapons and, in return, nuclear weapons states would progressively reduce their arsenals. But the nuclear weapons states have failed to disarm while their leaders continue to decry nuclear ambitions by other states.

There is a blatant double standard in regard to states acquiring nuclear weapons, with some being castigated whereas others are tolerated. Aside from the original nuclear club of the United States, Soviet Union, Britain, France and China, the country thought to have the most nuclear weapons is Israel, yet no heavy diplomacy has been used in response. The Indian and Pakistani governments have acquired nuclear weapons but paid a relatively small diplomatic and economic penalty. Pakistani scientist A. Q. Khan is known as having provided nuclear weapons knowledge and technology to Iran, Libya and North Korea. Yet the Pakistani regime has been treated, by the US administration, as a valued partner in the war against terror.

The US government has instead focused its attentions on much weaker states: Iraq, Iran and North Korea. The invasion of Iraq was justified by hollow claims about Iraqi weapons of mass destruction.

Anti-proliferation thus has been undermined in a number of ways. The nuclear weapons states have failed to disarm, discrediting the NPT and reducing the moral pressure on other governments to foreswear nuclear weapons. Nuclear power has been promoted, laying the basis for nuclear weapons programmes through expertise, technology and fissile material. Double standards, by the US government in particular, towards actual and potential nuclear weapons states, have allowed or even stimulated proliferation. The US government is selling uranium to India and the Australian government has contracted to sell uranium to Taiwan, thus undermining the NPT, as India and Taiwan are not signatories.

Protecting Against Terrorist Attack

A terrorist attack on a nuclear facility is a known risk, so just what is being done about it? Richard Levernier had 23 years of experience as a nuclear security professional. After 9/11, he pointed out problems with contingency plans to protect US nuclear power plants from attacks by terrorists, specifically that the plans assumed attackers would both enter and exit from facilities, whereas suicide terrorists would not need to exit. In response, the Department of Energy withdrew Levernier's security clearance and relegated him to a basement office doing admin work, thus terminating his career in nuclear security. Levernier sought relief from the Office of Special Counsel, which handles US federal whistleblower matters. It took four years for the OSC to vindicate Levernier, ruling that the Department's retaliation was illegal—but the OSC could not reinstate Levernier's security clearance, so he was unable to regain work in nuclear security.[11]

Levernier's experience is paralleled by others who have raised concerns about terrorism.[12] For example, Bogdan Dzakovic worked for the Federal Aviation Administration in the US, heading the Red Team that tested preparedness for hijackings and terrorism by undertaking mock raids. The efforts were all too successful in breaching security and thus embarrassing to the FAA, which, instead of fixing the weaknesses, closed down the Red Team shortly after 9/11. Dzakovic made a public interest disclosure about the problem, after which he was reassigned to clerical duties.[13]

Lack of public information about security at nuclear facilities makes it impossible to know exactly what is happening, but cases such as Levernier's and statements from nuclear power plant guards[14] suggest the existence of competing pressures: on the one hand the desire by managers to be well prepared against attack, on the other their dislike of publicity about weaknesses in their preparations. Yet only by listening to critics and acknowledging dangers is it likely that steps will be taken to make sites more secure.

Vulnerable Technology

In choosing technologies, various factors are taken into account, such as functionality, reliability, durability, cost and ergonomics. One potentially important factor is vulnerability to specific threats. For example, the operation of an integrated steelworks is vulnerable to cut-offs of electricity, water, coal, iron ore or computing, which might be due to natural disaster, strikes, foreign economic collapse or war.[15]

A resilient technological system, on the other hand, is one that can continue to operate in the face of various threats.[16]

Looked at holistically, nuclear power has a number of vulnerabilities, ranging from reactor accidents to failure to develop safe disposal of long-lived radioactive waste. A key vulnerability, as discussed already, is to criminals or terrorists in a plutonium economy.

A coal-fired power plant is also a potential terrorist target, but not a very likely one because coal, unlike plutonium, is not easy to fashion into a deadly weapon with acute effects, nor is it dreaded in the same fashion, which reduces its attractiveness to terrorists. Bombing a coal-fired power plant could have devastating consequences, but not with such long-lasting effects as bombing spent fuel rods.

Dispersed renewable energy sources have even less attraction to terrorists. An attack on a wind farm would impose economic costs but would pose little threat to human health or the environment. Attacking thousands of solar hot water heaters has even less plausibility. Energy efficiency—for example installing efficient light globes and building energy-efficiency buildings—seems to pose no terrorist risk whatsoever. Indeed, reducing energy demand actually reduces the risk, because with less central power generation there is less potential for disruption.

Generally speaking, terrorism risks are greater when the power supply is more centralised, because that means fewer people—terrorists, criminals or indeed strikers—can cause disruption. Renewability per se is not protection: large dams are ideal targets for terrorists.

These considerations have been well known for decades,[17] yet they seem to have had little impact on technological choice for energy futures.

Rhetorical Moves

On the one hand, governments have cited terrorism as a crucial threat to social life, yet on the other hand some of these same governments have touted nuclear power as a solution to the problem of global warming. This seems contradictory, given the risk of nuclear terrorism. The contradiction is not resolved in practice, given that: (1) safer nuclear technologies have not been developed or implemented; (2) nuclear power has contributed to proliferation of nuclear weapons; (3) there are gaps in protection of nuclear facilities; and (4) the vulnerability of energy options seems to have had little overt influence on technological choice.

One way to deal with contradictions in practice is to use rhetoric to hide or transform them. This can be observed in the way nuclear power and terrorism are discussed, both separately and conjointly.

Separate Discourses

Proponents of nuclear power generally tout its advantages, such as the vast amount of energy created by a small lump of uranium and the negligible emission of greenhouse gases from nuclear power plant operations. Not surprisingly, they give much less attention to disadvantages, such as reactor accidents, waste disposal or for that matter the greenhouse gases emitted in mining and milling uranium and building nuclear facilities. But proponents do, when challenged, address arguments about accidents, for example comparing deaths from just a part of the nuclear fuel chain with those from coal power. But it is striking that nuclear proponents almost never

initiate discussions of terrorism, and certainly never claim that nuclear power is a way to reduce terrorism.[18]

Most writings on terrorism focus on dangers from specific terrorist groups, the motivations of terrorists, their organisation, and ways to deal with the threat. But there is seldom any mention of technological choice as a way to reduce the risk of terrorism and almost no mention of the spread of nuclear power as something that will increase hazards from terrorism. Even those writings challenging conventional orientations to terrorism seldom mention technological choice.

The existence of separate discourses helps keep connections between nuclear power and terrorism invisible.

Cure, Not Prevention

In both nuclear and terrorism discourses, the emphasis is on curing an existing problem, not addressing the causes of the problem. Advocates of nuclear power have for decades argued that world energy demand is rising relentlessly, especially as poorer peoples aspire to affluent lifestyles. Their solution is a new energy source, to solve the looming energy shortage. In recent years, nuclear proponents have latched onto global warming as a new problem for which nuclear power is the cure.

An alternative perspective is to focus on prevention, namely controlling and eventually reducing world energy demand, through energy efficiency and through choices about town planning, transport and consumer goods. Focusing on prevention means looking at technology choice further upstream.

Similarly, conventional antiterrorism focuses on current threats and risks, such as existing terrorist groups and vulnerabilities such as hijacking of aircraft. Far less attention is given to prevention of terrorism by promoting social justice or supporting non-violent action as an alternative to terrorism as a means of social change.[19]

This focus on cure helps hide the possibility of reducing nuclear terrorism by pursuing non-nuclear paths. The assumption is that energy demand and greenhouse warming exist, so nuclear power is needed to solve the problem. And the assumption is that nuclear plants exist, so they need to be protected from terrorists. The absence of a prevention orientation means nuclear power can be touted as a solution to one problem—energy demand in a situation of global warming—without attention to its contribution to another problem, terrorism.

One explanation for the cure orientation to nuclear terrorism is the assumption of a strong state, namely that the power of the state is or can be made sufficiently great to deal with any threats, nuclear or otherwise. This highlights yet another contradiction: many of the political proponents of nuclear power, such as George W. Bush, use the rhetoric of promoting markets and small government, but in advocating nuclear power, they are promoting a technology requiring greater state power.

Lifestyles and Freedoms

Promoters of nuclear power invariably assume that energy problems must be solved without any significant change to Western lifestyles. What this means is that people shouldn't be asked to give up large houses, cars, or the expectation of ever more consumer appliances. Absent from the pro-nuclear agenda are options that change the way people relate to each other, such as car-pooling, sharing lawn-mowers and other appliances, reusable containers, communal living quarters, community gardens and voluntarily living with fewer material possessions.

Some opponents of nuclear power have raised these sorts of options, sometimes seen as desirable in their own terms by fostering a sense of community and harmony with nature.[20] But this has been a minority stream, with most prominent nuclear opponents accepting the assumption of lifestyle continuity, arguing that it is quite possible to maintain Western standards of living using energy efficiency and a gradual uptake in renewable energy sources.[21] This might be considered a sensible approach, given that the anti-nuclear argument is quite sufficient without changing lifestyles, a contentious matter for some people and a likely target for nuclear proponents, who have claimed that critics want people to live in cold dark caves. Because opponents of nuclear power have, for the most part, voluntarily avoided lifestyle issues, the assumption of lifestyle continuity has remained an unquestioned assumption on both sides of the debate.

In practice, quite a number of people have pursued alternatives to the conventional energy-intensive lifestyle, but this has not featured significantly in the nuclear debate.

Although promoters of nuclear power assume Western lifestyles are inviolate, they are silent about the massive lifestyle changes that could be caused by a nuclear economy. Proliferation increases the risk of nuclear war, a massive threat to lifestyles. To protect against criminal and terrorist threats to nuclear facilities, surveillance and police powers are needed—for example Australian laws passed in 2003 that could be used to repress anti-nuclear protest[22]—again causing a threat to lifestyles. But these threats are qualitatively different from car-pooling: they are threats to life and civil liberties, which are normally bracketed off as 'political' and seen as separate from 'lifestyles'.

There is an exact parallel in the terrorism debate. It has frequently been noted that anti-terrorism measures are compromising freedoms, such as freedom of speech, freedom of assembly, freedom from arbitrary arrest, and the right to a fair trial—supposedly the freedoms disliked by terrorists. Antiterrorism is a threat to lifestyles, presented as a protection of lifestyles.

Terrorists as Others

In the conventional view of terrorism, terrorists are always someone else, not 'us'. The usual conception is that terrorists are non-state groups such as al Qaeda plus, sometimes, so-called rogue states such as North Korea. But attempts to define terrorism are mired in confusion, with dozens of conflicting definitions. Labelling of particular groups as terrorists often seems more a matter of stigmatisation than accuracy. During apartheid, the South African government called opponents terrorists; during the Vietnam war, the US government described its enemies as terrorists. The label terrorist thus often serves as an imprecise term of abuse.[23]

State terrorism is missing or an afterthought in conventional pictures of terrorism.[24] Yet if terrorism is defined as violence against civilians as a means of creating fear, then governments commit vastly more terrorism than non-state groups.[25] Torture can be considered to be a form of terrorism, and it is committed almost entirely by governments, indeed by dozens of governments. Mass killings can constitute terrorism, and the most deadly killings have been by governments, for example 200,000 people in Guatemala in the 1980s, half a million to a million in Indonesia in 1965–66, and tens of millions in the Soviet Union during communist rule. Genocide can be considered terrorism: it certainly strikes terror into the target population. Examples include up to a million in Rwanda in 1994, two million

in Cambodia in the late 1970s and from one to three million in East Pakistan, now Bangladesh, in 1971. Some scholars believe more people died in genocides during the twentieth century than from warfare.

Western governments, by focusing on non-state terrorism, obscure their own role in aiding or tolerating state terrorism. For example, the Australian government did nothing to stop Indonesian killings in East Timor after 1975, and today is silent about Indonesian killings in West Papua. The US government supported the Guatemalan government during its genocidal attacks on the indigenous population. The UN Security Council—whose agenda is shaped by the most powerful states—failed to mount an effective intervention against genocide in Rwanda.

It is also possible to conceive of warfare as a form of terror. There is no doubt that some weapons, military techniques and campaigns are intended to strike terror into the opponent, including civilian populations. During the US civil war, Sherman's famous march to the sea in essence involved terrorising the population. During World War II, Nazi V-2 missiles did relatively little damage to British military capability but terrorised the population. Later, Allied bombing of German cities had the same consequences. The US-led 'shock and awe' assault on Baghdad in 2003 was a way of terrorising the Iraqi people.

Nuclear weapons are the ultimate form of military terrorism. There is no doubt that many people have been deeply frightened by nuclear weapons, which is one reason for the rise of anti-nuclear movements. Government leaders of course do not speak of their nuclear arsenals as instruments of terror—that is left to critics[26]—but use the rhetoric of defence and deterrence.

However, nuclear weapons in the hands of certain others—such as Saddam Hussein—are portrayed as dire threats. Nuclear terrorism, like terrorism in general, is framed as a threat coming from others.

In this way, the contradiction in policies concerning nuclear weapons are masked by the rhetoric of nuclear terrorism as coming only from others. Proliferation is a threat, but 'our' nuclear weapons are not. Nuclear terrorism by non-state groups or rogue states is a threat, but nuclear terrorism by 'us' is outside the conceptual universe.

Conclusion

Nuclear technology has a high potential for terrorist use, but attention to this issue has been limited and partial. A number of individuals and groups have made valiant efforts to raise awareness about nuclear terrorism. Graham Allison's book on the subject presents the dangers vividly.[27] The Nuclear Control Institute in the United States has been raising concerns about security of nuclear facilities since the 1980s, but these efforts have been insufficient to have much impact on policies. Safer ways of producing nuclear power, for example using underground construction, have not been pursued because they are too expensive. The nuclear fuel cycle continues to be a major route for proliferation of nuclear weapons capabilities. Some who speak out about the vulnerabilities of nuclear facilities suffer reprisals rather than receiving rewards. More generally, technological innovation proceeds without explicit attention to the vulnerability of technological systems to terrorist uses.

These policy contradictions are hidden by a series of rhetorical moves built on questionable assumptions. Debates about nuclear power and about terrorism proceed independently, as if there is no connection between them. In this way, the

contribution of nuclear power to nuclear terrorism is removed from the agenda, and the role of technological choice in reducing the risk of terrorism is ignored. The two debates also proceed on the basis of assumptions about prevention: the solution to energy problems is seen as a matter of energy supply rather than modifying energy demand; the solution to terrorism is seen as a matter of dealing with existing terrorists rather than altering the conditions fostering terrorism.

Another rhetorical tactic is to rule out changes to consumer lifestyles as a way of dealing with energy problems, but to ignore other sorts of changes to lifestyles—changes in safety and liberty—associated with the nuclear option. This can also be thought of as a double standard concerning lifestyle change. Finally, in standard discourse, the only terrorists are others, and nuclear weapons are not thought of as instruments of terrorism, except when in the hands of certain others.

On the surface, it seems surprising that governments can promote both nuclear power and antiterrorism while giving scant attention to the intersection of these two issues, namely the vulnerability of nuclear facilities to terrorist attack and the role of the nuclear fuel cycle in the proliferation of nuclear weapons, with an associated increase in the risk of non-state groups acquiring nuclear materials for terrorist purposes. The policy contradictions are the most serious matter: promotion of nuclear power is leading to nuclear proliferation, and nuclear facilities are vulnerable to terrorist attack. These contradictions are masked by long-standing assumptions and rhetorical conventions that remove policy contradictions from consciousness: nuclear terrorism is seen as a danger caused by others.

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