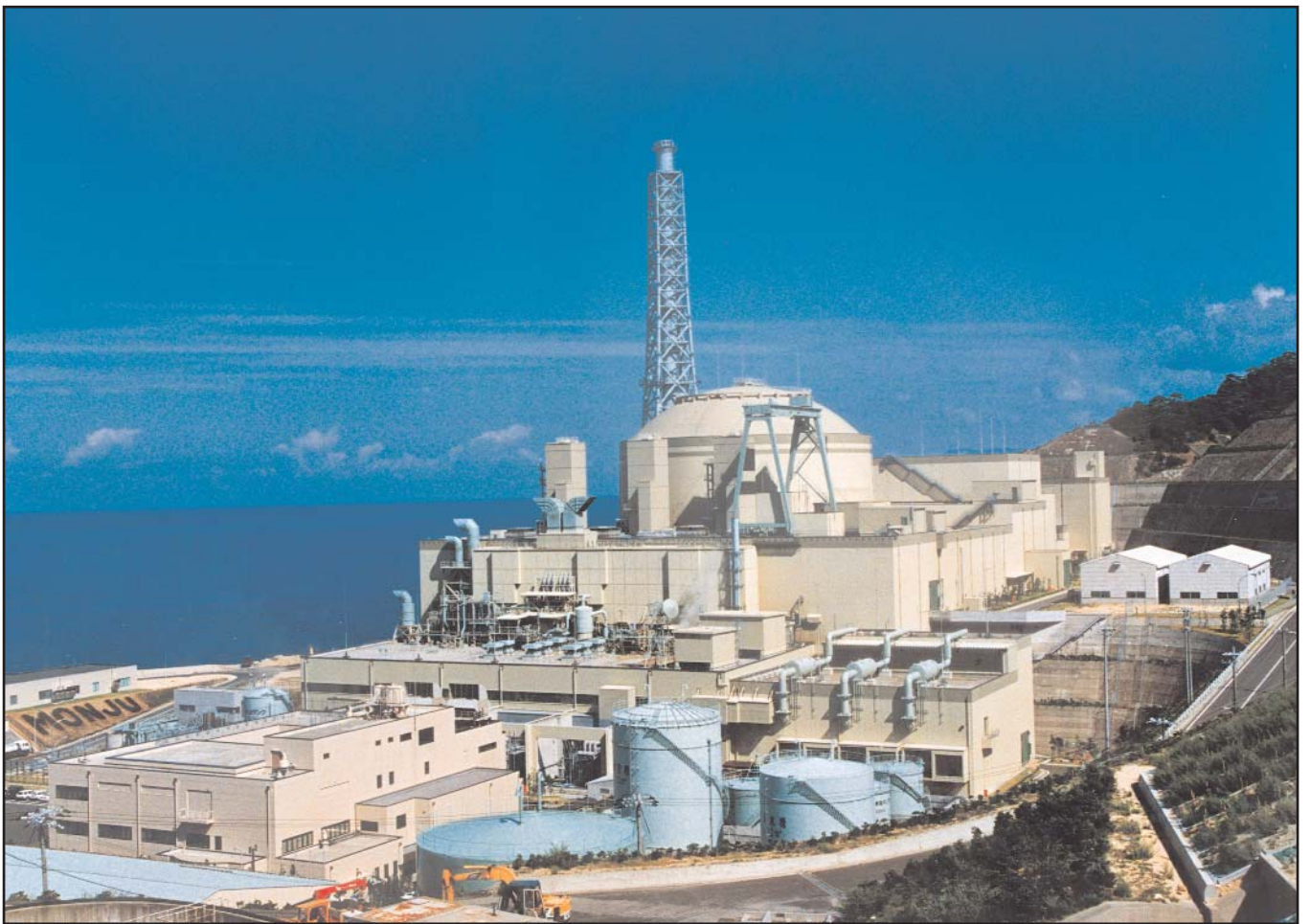


# Thinking the Unthinkable

## Japanese nuclear power and proliferation in East Asia

Frank Barnaby and Shaun Burnie



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Oxford Research Group  
51 Plantation Road  
Oxford  
OX2 6JE  
United Kingdom

[www.oxfordresearchgroup.org.uk](http://www.oxfordresearchgroup.org.uk)

Citizens' Nuclear Information Center  
3F Kotobuki Bldg  
1-58-15 Higashi-nakano, Nakano-ku  
Tokyo, 164-0003  
Japan

[www.cnic.jp](http://www.cnic.jp)

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## About the Authors

**Dr. Frank Barnaby** is a Nuclear Issues Consultant to Oxford Research Group (ORG), and has been on ORG's Council of Advisers since its inception. He is a nuclear physicist by training and worked at the Atomic Weapons Research Establishment, Aldermaston between 1951-57. He was on the senior scientific staff of the Medical Research Council when a lecturer at University College London (1957-67). He was Executive Secretary of the Pugwash Conferences on Science and World Affairs in the late 1960s and Director of the Stockholm International Peace Research Institute from 1971-81. He was Guest Professor at the Free University, Amsterdam (1981-85) and Visiting Professor at the University of Minnesota in 1985. He is now a freelance defence analyst, and is a prolific author on military technology. In addition to the numerous Briefing Papers he has written for Oxford Research Group and other organisations, his books include: *The Invisible Bomb* (Tauris, 1989), *The Gaia Peace Atlas* (Pan, 1989), *The Automated Battlefield* (Sidgwick & Jackson, 1987), *Star Wars* (Fourth Estate, 1987), *Future Warfare* (Michael Joseph, 1986) and *How to Build a Nuclear Bomb* (Granta, 2003). Frank is also a regular commentator on nuclear and global security issues in both the national and international media.

**Shaun Burnie** is Coordinator of Greenpeace International nuclear campaigns. Based in Scotland, he has worked in Japan and Korea since 1991. He writes in a personal capacity and this briefing does not necessarily reflect the views of Greenpeace International. Further background on issues raised in this briefing include: Nuclear Twilight Zone, Bulletin of Atomic Scientists, May 2001, Burnie/Aileen Mioko Smith; Planning for Failure: Nuclear Safeguards at the Rokkasho-mura plant, Burnie/Barnaby, Greenpeace International, 2002; and most recently a report on advanced nuclear technology developments in North-east Asia at the International Conference on Proliferation Challenges in North-east Asia: The Korean Peninsula and Japan, April 2005, National Assembly Seoul. Reports available from [shaun.burnie@int.greenpeace.org](mailto:shaun.burnie@int.greenpeace.org).

# **Thinking the Unthinkable**

## **Japanese nuclear power and proliferation in East Asia**

**Frank Barnaby, Oxford Research Group**

**Shaun Burnie, Greenpeace International**

**August 2005**

## **Contents**

Foreword, by Professor Michiaki Furukawa	4
Introduction	6
The pursuit of plutonium	7
Japan's no-plutonium stockpile policy	7
The Rokkasho-mura reprocessing plant	8
Political momentum towards nuclear weapons	10
Conclusions	12
References	13

## Foreword

The paper begins with a brief discussion of the sixty-year history since the dropping of the plutonium bomb on Nagasaki. It then looks at Japan's own attempts to acquire plutonium. America's role in this was very significant. It required a great deal of negotiation in order for Japan to obtain America's approval to reprocess spent nuclear fuel.

The paper then looks at the Rokkasho Reprocessing Plant in Aomori Prefecture, which is currently proceeding towards start-up. The key issues here are the problems associated with the protection of nuclear materials and the fact that there is almost no use for the plutonium that will be separated.

In regard to the first of these issues, the significant point is made that inspections by the International Atomic Energy Agency are ineffective. It is difficult to even determine the quantity of plutonium contained in the spent fuel that enters the plant.

In regard to the second issue, the problem is that Japan has failed in its attempt to develop fast breeder reactors (FBR) and the plan to use a mixed oxide of plutonium and uranium (MOX) as fuel in light water reactors is not proceeding according to plan. (In Japan this is referred to as the 'pluthermal' programme.) Consequently, there is no end use for the plutonium.

Finally the report looks at the possibility that Japan might acquire nuclear weapons. This is a delicate issue connected to both international and domestic politics and people will have different views about it. However, this report is a good opportunity for Japanese people to find out what non-Japanese experts think about the issue.

There are plenty of people in Japan who are willing to talk about the development of nuclear weapons in other countries, but few Japanese people are keen to discuss the possibility of Japan acquiring nuclear weapons. It is painful to think hard about this issue. In my own case, it is not that I do not think about it. It is rather that I fear that public opinion could suddenly swing in the wrong direction and the Japanese public could actually end up accepting nuclear weapons. It is also worth

bearing in mind the fact that, as this report points out, in countries which have had nuclear weapons programmes, the general public was not involved in the debate.

Looking at the history of nuclear energy, the large-scale release of nuclear energy began with nuclear weapons. This was the case for all the so-called great powers. The consequences of this continue to this day.

Returning to the question of plutonium, in order to make nuclear weapons either highly enriched uranium or plutonium is required. However, it is no easy matter to produce highly enriched uranium. To produce enough to make a nuclear weapon requires a great deal of time and technological skill. It was very difficult to produce the highly enriched uranium used in the bomb dropped on Hiroshima 60 years ago. In comparison, it is relatively easy to produce plutonium. It is necessary to process highly radioactive spent nuclear fuel, but the principles of chemical separation are easy to understand and it is easy to carry it out. In fact, the majority of the world's atomic bombs use plutonium.

The Rokkasho Reprocessing Plant is moving towards start-up, but the important issues raised in this report have received little attention in Japan. Clearly the issue of nuclear weaponisation is more than just a technical question. A full analysis of the matter is beyond my expertise. For that reason, I hope people from a wide range of disciplines will give attention to the issue.

Looking at the domestic political drivers behind Japan's rush to reprocess spent nuclear fuel, in my opinion the reason for this is simple. The power companies have promised the prefectures where nuclear power plants are located that they will remove the spent fuel from the prefecture. This is central government policy. However, Aomori Prefecture, where the Rokkasho Reprocessing Plant is located, would not hold spent fuel for long periods of time if it is not going to be reprocessed. So the question arises, "What is to be done with the spent fuel?"

The end use of the separated plutonium is an

equally intractable problem. I have had the opportunity to observe the deliberations of the Nuclear Policy-Planning Council. During these deliberations development of FBR was discussed. Those who spoke in favour of FBR fell into a few clearly identifiable categories: the president of the Japan Nuclear Cycle Development Institute (the organization responsible for development of FBR), the vice-chancellor of Fukui University (the Monju FBR is located in Fukui Prefecture), and a few professors who work in the nuclear fuel cycle field. There was not a word from the presidents of the power companies. This is because they do not want anything to do with FBR. They don't want to be lumbered with the huge costs that it entails.

As for the other stated end use of Japan's growing stockpile of plutonium, I believe that there is not a single power company in Japan that really wants to proceed with the pluthermal program. It is difficult to get documentary proof of this, but everyone familiar with the situation believes this to be the case.

I commend this timely paper to everyone interested in the problems of nuclear energy in the broadest sense and hope it will be read by large numbers of people.

*Professor Michiaki Furukawa*

**Emeritus Professor of Nagoya University**

**Member of the Board, Directors of the Citizens'  
Nuclear Information Center**

**August 2005**



## Introduction

As we reach the anniversary of the end of World War II, North-east Asia has changed in so many ways since the devastation brought about by years of conflict. But tragically, many historical problems remain unresolved. The Korean peninsula is still divided; the United States is the predominant military power in the region; and nationalism remains a powerful force in Japan, China and in the Koreas. These alone should give rise to major concern for the future peace and stability of the region. But the threats to peace in the region could soon get worse.

Sixty years ago the city of Nagasaki was destroyed by one nuclear bomb containing five kilograms of plutonium. In 2005, Japan has one of the largest stocks of weapons usable plutonium in the world (45,000 kg and growing) as well as access to the most advanced missile technology. This is not by accident but design. Deliberate policy established in the late 1960's by senior politicians was to acquire the nuclear material required for atomic bombs, and the means to deliver them.<sup>1</sup> Without having to cross the difficult threshold of actual weapons development, Japan has already become a de-facto nuclear weapons state.

Successive Japanese governments have achieved this status through a nuclear energy policy based upon the production and use of plutonium, and an ambitious if flawed commercial space programme. It is this nuclear policy that will soon lead to the commissioning of the world's most expensive nuclear facility - the Rokkasho-mura reprocessing plant.<sup>2</sup>

The big question is whether or not a future Japanese government will take a political decision to develop nuclear weapons. Nuclear proliferation threats on the Korean peninsula and the growth of China's economic and military power are two important (and real) drivers that are being cited by powerful interests in Japan as justification for considering what should be the unthinkable.

So at a time when the tensions, and therefore the proliferation dynamics in North-east Asia, are becoming both more serious and complex, there is an urgent need to examine both Japan's plutonium programme and the political context of Japan's nuclear weapons policy. This briefing will seek to focus on a few of these.



## The pursuit of plutonium

***“Can Japan expect that if it embarks on a massive plutonium recycling program that Korea and other nations would not press ahead with reprocessing programs? Would not the perception of Japan’s being awash in plutonium and possessing leading edge rocket technology create anxiety in the region?”***

Diplomatic cable U.S. Ambassador to Japan,  
to U.S. Secretary of State Christopher,  
March 1993.

Unlike South Korea and Taiwan, which had their pursuit of reprocessing and plutonium frustrated by direct U.S intervention, Japanese nuclear energy policy since the 1960’s has been based upon the large-scale production and use of plutonium. The original plan to separate plutonium from nuclear reactor spent fuel and then use it to fuel a generation of fast breeder reactors has failed, with only the Monju fast reactor remaining. Instead the plan to use plutonium as fuel is dependent upon successful loading in conventional light water reactors. This plan too has run into major delays due the reality of unsafe technology, poor operating standards, and a determined anti-nuclear movement that has, over recent decades, challenged all major developments.

Whereas in 1994, Japanese officials were predicting that plutonium demand (how much is required to fuel nuclear power plants) would be 85-90,000 kg by 2010, today in 2005 not one gram of plutonium is loaded into commercial nuclear power reactors. Moreover, while the demand side has been a disaster for Japanese government plans, its plutonium supply has run out of control, with total plutonium stocks over 45 metric tons – a fivefold rise from the early 1990’s. This could rise to over 100 tons within the next fifteen years.

To date most of this plutonium has accumulated in overseas reprocessing plants in France and the UK under contracts signed with Japan. However, with plans to start up the US\$21 billion Rokkasho plant, Japan will have a reprocessing capacity only equalled by the world’s largest nuclear weapons states.

## Japan’s no-plutonium stockpile policy

***“...vague and uncertain.”***

U.S. Embassy Tokyo on Japanese official plutonium demand figures, November 1991.

In response to political pressure over its plutonium programme, the Japanese government declared in the early 1990’s that it would not hold more plutonium than was necessary for commercial use. The government’s ‘no plutonium stockpile’ policy and their declared supply and demand figures for plutonium, were meant to reassure the international community, particularly in East Asia, that Japan would only possess sufficient plutonium to meet commercial requirements. However, almost from day one, Japan has possessed well in excess of its requirements, and as the 1990’s unfolded the excess stock has increased.

***“The squishy part of the Japanese plan, where the numbers appear vague and uncertain, is the use of MOX fuels in commercial reactors. If use is less than planned Japan will have to slow down its reprocessing and accumulate growing amounts of unprocessed spent fuel, or will have to produce separated plutonium that is clearly excess to Japan’s civilian needs.”***

U.S. Embassy diplomatic cable to U.S. Secretary of State, ‘Japanese plutonium transport and reprocessing issues’,  
November 15<sup>th</sup> 1991.

Nearly fifteen years on and the only thing that has changed is the volume of Japanese plutonium. Japanese plans for plutonium fuel (MOX) use remain highly ‘squishy’ or uncertain. At the time of this diplomatic cable (1991) Japan had a total of 9,000 kg of plutonium. The current stockpile has increased fivefold to nearly 45,000 kg.

In 1991, Japan’s Atomic Energy Commission predicted that by 2010:

- 50 tons of plutonium in MOX would be loaded into light water reactors
- 10 tons of plutonium in MOX loaded in Advanced Thermal reactors;

- 20-30 tons of plutonium in MOX loaded into Fast Breeder reactors.

In reality these projections have been completely wrong. If we add Japan's current available plutonium stockpile (45,000 kg) to the cumulative supply of plutonium from Rokkasho operations through to 2020 (100,000 kg), by 2020 Japan's plutonium stockpile will reach 145 metric tons. It is clear that Japan has become the world's largest holder of weapons-usable plutonium, far surpassing that contained in the United States nuclear weapons arsenal of 100 tons.

*“I admit that we have excessive amounts of plutonium, but our purpose is for research.”*

Yuichi Tono-zuka, president of the Japan Nuclear Cycle Development Institute,  
April 2005.

No such justification would be permissible by a South Korean nuclear official, because the United States blocks Seoul from acquiring plutonium.

Still, it is almost inconceivable that Japan's plans for plutonium MOX fuel by 2020 will use more than forty or so tons of plutonium. The history of Japan's programme would suggest that they will fail to utilize even this amount. Thus Japan's stockpile of plutonium will continue to grow with all the resultant negative consequences for global nuclear non-proliferation and regional peace and security.

## **The Rokkasho-Mura Reprocessing Plant cannot be safeguarded and should be abandoned**

The 2005 Non-Proliferation Treaty (NPT) failed to reach any sort of consensus. It is, therefore, urgent to strengthen the NPT regime and revitalise the Treaty. In the short term, the most important measure to do so is to strengthen the safeguards system applied by the International Atomic Energy Agency (IAEA), to make it more difficult to acquire fissile materials, plutonium and highly enriched uranium, to make nuclear weapons.

The most serious problem facing the IAEA safeguards system is that the most sensitive plants insofar as the diversion of weapon-usable materials is concerned – particularly uranium-enrichment facilities and plutonium reprocessing plants – are impossible to safeguard effectively.<sup>3</sup> Consider, for example, large commercial reprocessing plants which separate the unused uranium, plutonium and fission products in spent nuclear power reactor fuel elements, such as the one under construction at Rokkasho-Mura.

Safeguarding the plutonium in spent nuclear reactor fuel elements before reprocessing is relatively simple. It is just a matter of counting the number of the elements. Once the plutonium is removed from spent reactor fuel elements in at Rokkasho-Mura safeguarding it is quite a different matter. There is no clear distinction between the commercial use of plutonium and its military use. To argue that the further spread of nuclear weapons must be prevented, as Japan does, while, at the same time, operating a civil reprocessing plant is, to say the least, inconsistent.

A good nuclear-weapons designer could construct a nuclear weapon from three or four kilograms of the plutonium produced by the Rokkasho-Mura reprocessing plant. To ensure the timely detection of the diversion of such a small amount of plutonium in a plant where so much plutonium is handled requires very precise safeguards techniques, requiring significantly more precision than is currently achievable. Even with the best available and foreseeable safeguards technology it is not possible to get the precision necessary.<sup>4</sup>

In August 2004, a leak started in a pipe connected to the accountancy tank at the front end of the THORP reprocessing plant at Sellafield and complete failure of the pipe occurred in mid-January 2005.<sup>5</sup> Solution, containing spent reactor fuel elements dissolved in nitric acid, leaked into a cement secondary containment chamber. The leak was not detected until April 2005, eight months after it began, by which time about 83,000 litres, containing about 160 kg of plutonium, had leaked out. Opportunities to detect the leak – cell sampling and level measurements – were missed. That this incident could have occurred is one example of the inadequacies of the safeguards system for reprocessing plants.

The main reason for the difficulty of safeguarding the Rokkasho-Mura plant relates to uncertainty about the amount of plutonium entering the plant. An estimate of this amount is made from the amount of uranium in the spent reactor fuel elements sent to the reprocessing plant by the Japanese operators of the reactors. This is calculated by the reactor operators from their knowledge of the amount of uranium originally in the reactor fuel elements and of the way in which the reactor was operated while the fuel was in it. In particular the amount of heat produced by the fuel. The estimate relies on computer calculations not direct measurement.

The first measurement, as opposed to an estimate based on calculation, of plutonium in the Rokkasho-Mura reprocessing plant is made on samples taken from an accountancy tank at the beginning of the process. Using mass spectrometry, the ratio of the amount of plutonium to the amount of uranium is determined. From the calculated amount of uranium and the measured uranium/plutonium ratio, the amount of plutonium is calculated.<sup>6</sup>

There may be errors in each stage of this operation. For example, some plutonium will remain in the parts of the fuel elements not dissolved in the nitric acid (called “the hulls”). The amount is very difficult to estimate.

The operators of the Rokkasho-Mura reprocessing plant will, therefore, be uncertain about the precise amount of plutonium produced by the plant. The uncertainty is called the “material unaccounted for” or MUF. Because of the nature of the errors involved, the value of the MUF will usually not be

zero even if no illegal diversion of plutonium has occurred.

The fact that there is a MUF means that the operators of a commercial reprocessing plant do not know whether or not an amount of plutonium has gone missing. For example, if the police ring up the operators and say that a terrorist or criminal group has contacted them and provided evidence that they have acquired some plutonium, enough to fabricate a nuclear explosive, the operators could not confirm with any certainty that a few kilograms had, or had not, gone missing. This is because the amount that may be missing will be within the MUF. It must be concluded that currently the IAEA cannot effectively safeguard the Rokkasho-Mura reprocessing plant.

According to recent estimates, the potential material unaccounted for (MUF) at the Rokkasho-Mura plant will be around 50 kg per year. This plant, which will include the most up-to-date safeguards technologically available, is designed to allow the application of the most effective safeguards possible today. The plant will have the capacity to reprocess about 800 tonnes of spent fuel a year, producing about eight tonnes of plutonium. The effectiveness of safeguards on the plant, according to these estimates, is more than 99%. Nevertheless, even on these very optimistic estimates, the potential material unaccounted for still amounts to about a nuclear weapon’s worth a month.

We realise that the official response to MUF is to claim that even if plutonium goes astray from the reprocessing plant, physical protection measures applied will prevent it leaving the site. We disagree with this and question the effectiveness of physical protection, and therefore still believe the safeguards system is inadequate.

The Japanese nuclear industry is keen to reprocess spent reactor fuel because it recovers unused uranium and plutonium that can be reused as nuclear fuel. The fact that there may be some plutonium unaccounted for at Rokkasho-Mura is acknowledged, but it is argued that physical protection measures can be made sufficiently effective at the plant to ensure that no significant amounts of plutonium are removed from the site. Those anxious to prevent the use of plutonium for the production of nuclear weapons by the government or by terrorists argue that any

significant amount of plutonium unaccounted for is unacceptable and that reprocessing at Rokkasho-Mura plant should be abandoned.

There is no need to reprocess spent nuclear power reactor fuel elements. Civil spent reactor fuel elements can be stored until they can be permanently disposed of in a geological repository – such as the one planned by the USA at Yucca Mountain.

Plutonium is generally used as nuclear-reactor fuel in the form of mixed oxide (MOX) fuel. The plan is to produce MOX at the Rokkasho-Mura plant by mixing uranium dioxide and plutonium dioxide. This can be used as fuel in Japanese nuclear-power reactors instead of uranium dioxide.

MOX enthusiasts argue that the use of MOX allows plutonium to generate more energy in nuclear reactors rather than wasting this energy, and that the use of MOX would reduce the stockpiles of civil Japanese plutonium. These stockpiles are politically embarrassing for the Japanese government because the plutonium could be used to fabricate nuclear weapons. The cost of MOX fuel is, however, much higher than the cost of ordinary uranium dioxide fuel.

The use of MOX increases the risk of nuclear-weapon proliferation. The necessary steps of chemically separating the plutonium dioxide from uranium dioxide and converting the dioxide into plutonium metal that can be used to fabricate nuclear weapons are relatively straightforward.

The use of MOX in a nuclear-power reactor is not a satisfactory solution to the problem of excess plutonium stocks. A more rational solution would be to abandon reprocessing at Rokkasho-Mura and to immobilize existing stocks of Japanese plutonium until they can be permanently disposed of.

Safeguards and, therefore, the non-proliferation regime, would be significantly strengthened if reprocessing and the production and use of MOX at the Rokkasho-Mura plant were abandoned. This would significantly improve global security.

## **Political momentum towards nuclear weapons**

Not one country that has initiated a nuclear weapons programme since 1945 has done so on the basis of a democratic debate.<sup>7</sup> Decisions were made behind closed doors in great secrecy and in the context of external threats – actual, perceived, contrived and otherwise. In the case of Japan there is a dangerous assumption that the decision to build nuclear weapons will require the overturning of public opinion, which is generally considered to be by majority opposed to nuclear weapons. History informs us that conditions evolve that lead to debate and opposition after the threshold has been crossed, by which time it's too late.

Today, Japan is closer to those conditions than at any time since at least the 1960's, and probably since its wartime programme in the 1940's. In the case of the military programs run by the Imperial Navy and Army under the guidance of the father of the Japanese atom, Yoshio Nishina, it was lack of time, resources and fissile material that led to failure.<sup>8</sup> In the 1960's it was the political judgement that it was not in Japan's national interest to acquire the bomb – it could rely upon the U.S. nuclear guarantee (at least for the foreseeable future) and at the same time acquire the means to go nuclear if necessary.

With the technical means to build advanced nuclear weapons within six months, what remains is the political judgement of the ruling elite of Japan first to assess its strategic imperatives and then the political consequences of going nuclear.

As a de-facto nuclear weapons state under the U.S. nuclear umbrella, there remains today no immediate need for Japan to build nuclear weapons. Its plutonium stockpile is already a strategic asset. But the conditions for a decision are evolving, and the public is being softened up for a possible decision.

Since the 1950's leading politicians, including Prime Ministers and Cabinet Secretaries have pronounced on the possibility of Japan developing nuclear weapons. Many of these statements have made clear that the Japanese constitution does not prohibit Japan possessing nuclear weapons and



that its three non-nuclear principles are not legally binding.

Through most of this period the justification has been for obvious reasons, put in the context of national (self) defence, but in most cases without explicit threats being named (at least in public). Today the threats are now more explicitly cited. In recent years leading politicians such as Ichiro Ozawa warned that Japan could use its commercial plutonium stockpile for making nuclear weapons. Ozawa, leader of the opposition party Jiyuto (Liberal Party), declared in 2002 that if the military threat posed by China continued to grow:

***“It would be so easy for us to produce nuclear warheads - we have plutonium at nuclear power plants in Japan, enough to make several thousand such warheads.”***<sup>9</sup>

The crisis over North Korea’s nuclear weapons program, based around plutonium reprocessing, strengthened the position of those in Japan advocating nuclear weapons development. Acknowledged by no less than the U.S. Ambassador Thomas Schieffer to Japan: “If you had a nuclear North Korea, it just introduces a whole different dynamic... That increases the pressure on both South Korea and Japan to consider going nuclear themselves.” (Tokyo, June 2005). While such a declaration is intended to put pressure on China to act more forcefully with its ally in Pyongyang, it is also highly significant in terms of U.S. policy towards Japan.

In the 1960’s, the Nixon administration considered the option of arming Japan with nuclear weapons. Forty years on it would be surprising if there were not those in Washington considering that such a development would be in the medium term interests of the United States. And anyway, the U.S. is already signalling that it would not be able to stop it.

Of course, according to most analysts North Korea already possesses a few or several nuclear weapons. It has not yet demonstrated their existence through an actual nuclear test, although it has been speculated that it is imminent. At which point the debate in Japan over its security vulnerability to North Korean missiles would become frantic.

More likely a test remains a threat, which will be deployed only when North Korea has run out of other options. But the general atmosphere remains threatening and therefore fertile for those in Japan who would move towards weaponisation.

A further factor to consider is the general view that international opprobrium/condemnation would be visited on Japan if it were to go nuclear. It is true that the consequences for Japan’s nuclear trade would be problematic, perhaps severely damaging as Japan is supplied nuclear materials and technology under condition of peaceful use. But what of wider diplomatic and economic consequences?

It is worth considering the reality of international relations in the early 21<sup>st</sup> century. Japan’s major nuclear trading partners are in possession of their own nuclear weapons (and currently modernizing them) or covered by the U.S. nuclear umbrella. Current nuclear non-proliferation policy is based upon the double-standards of opposing the programmes of Iran or North Korea while maintaining or expanding their own weapons programs. Japan is unlikely to be labelled part of the axis of evil. If triggered by a North Korean test, or equivalent dramatic development, while not welcoming a Japanese bomb, it is likely that Japan’s allies would explain it as a regrettable but understandable reaction.

And it gets worse. Witness the experience of India and Pakistan in the aftermath of their nuclear weapons tests in 1998. While sanctions were applied, including by Japan, their reality today is that their relations with the United States and allies (especially Japan) have never been closer. They are both identified as strategic partners, with India seen as vital in terms of economic production and future markets, an ally in the ‘war against terror’ in the case of the military elite ruling Pakistan, and a counter balance to China in the case of India. The reality is that both countries have got away, *nae* thrived in the aftermath of becoming nuclear powers. India is due to sign nuclear cooperation agreements with the United States and Pakistan is soon to take delivery from the U.S. of nuclear strike capable F-16s.

As the world’s second largest economy, the important and dangerous lesson for policy makers in Japan is that the world soon learns to live with

nuclear realities. If India and Pakistan can do it, then Japan certainly can. Japan's strategic importance to the United States has moved centre stage under the Bush administration. Its Constitution is being revised with the active encouragement of the U.S., and Japan's military is being deployed overseas, and undertaking joint training with the U.S. as never before. The prospects of Japan moving further towards nationalism and militarism are made worse by the likely successor to Prime Minister Koizumi, Shinzo Abe in 2006.

## **Conclusions**

“Treat nothing as inevitable” is a good principle to live one's life by. Unfortunately, in the case of Japan's nuclear development, it may not be sufficient. The international community – read governments – will learn to live with Japanese nuclear weapons if that occasion arises. The consequences would of course be terrible for North-east Asia. Pressure in South Korea to respond would be huge, relations with China could become disastrous, and the global nuclear non-proliferation regime centred around the NPT reduced to a historical footnote.

Japan's existing plutonium programme is a driver for nuclear proliferation in the East Asian region and further afield. For example, Iran has cited Rokkasho to support its case for being permitted to complete its uranium enrichment plant at Natanz.

There is an alternative to Japan travelling full circle from the ashes of 1945 and becoming a declared nuclear weapon state. It will come through active citizen opposition in Japan based upon informed debate and mobilization, aided by support from overseas. A change in energy policy that abandons plutonium use on the grounds of non-proliferation would be an important first towards rejecting the path chosen by governments (but not the people) in the world's nuclear weapons states. It will also strengthen Japan's calls for global nuclear disarmament.

The nuclear weapon states, in particular the United States, continue to defy their legal obligations to disarm their nuclear weapons. The 60<sup>th</sup> anniversary of the first use of the atomic bomb is a hugely important opportunity to begin the mobilization not just in Japan but around the world.

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5. Nuclear Engineering International, Thorp board of enquiry report released, *Nuclear Engineering International*, 29<sup>th</sup> June 2005.
6. Frank Barnaby and Shaun Burnie, “Safeguards on the Rokkasho reprocessing plant”, *Greenpeace International*, June 2002.
7. The U.S. Manhattan project for obvious reasons was launched without Congressional debate; both France and the UK launched theirs with limited cabinet involvement and no parliamentary debate; the Soviet and Chinese program were initiated under direct orders of Stalin and Mao; India announced their program with a nuclear test in 1974; Pakistan similarly in 1998; Israel still refuses to officially confirm its program exists; South Africa dismantled its weapons only after the end of Apartheid and democratic elections. Programs run by Australia, Switzerland, Germany, Sweden, South Korea and Taiwan to name the most sophisticated were done so in great secrecy, with limited parliamentary debate in a few cases.
8. The first English language report confirming Japan’s nuclear weapons program was made by David Snell in the October 3<sup>rd</sup> edition of the Atlanta Constitution, the headline read, “Japan Developed Atomic Bomb - Russians Grabbed Scientists”. More substantive details on Japan’s wartime bomb program, Genzai Bakudan, were provided by Deborah Shapely in *Science*, vol. 199, Jan. 13<sup>th</sup>, 1978. While Snell claimed that Japan progressed to the point where it conducted a nuclear test on August 10<sup>th</sup> 1945, off the coast of present day North Korea, there remain significant doubts that such a test took place. The latest thinking is that without sufficient fissile material Japan was 6-9 months away from an actual weapon.
9. Ozawa’s statement was made during a lecture given in the southern City of Fukuoka, though was not supposed to be made public, April 2002, see Greenpeace International press statement, “Ozawa confirms nuclear weapons potential of Japan’s plutonium program as further nuclear transports loom”, April 7<sup>th</sup> 2002.



## About Oxford Research Group and Citizen's Nuclear Information Center

**Oxford Research Group** is an independent non-governmental organisation established in 1982 which seeks to develop effective methods whereby people can bring about positive change on issues of national and international security by non-violent means. Our work involves:

- undertaking and disseminating research on key security issues so that public debate can take place;
- researching how policy decisions are made and who makes them;
- engaging with policy-makers on constructive security policy options;
- fostering dialogue between policy-makers and their critics to explore creative solutions to national, regional and global security problems;
- promoting accountability and transparency in government decision-making.

Our research focuses on three broad areas: nuclear disarmament and non-proliferation; UK security policy; and global security in the changing international environment. We bring senior policy-makers together with independent analysts, scientists and technologists, military experts, writers and psychologists, to develop ways past the obstacles to achieving peace with security. In a range of environments, formal and informal, public and private, we use skilled facilitation to help build bridges of understanding as a means of developing new ideas and making possible significant policy shifts.

### OXFORD • RESEARCH • GROUP

51 PLANTATION ROAD • OXFORD • OX2 6JE, UK

TEL: +44 (0)1865 242819 • FAX: +44 (0)1865 794652

EMAIL: [org@oxfordresearchgroup.org.uk](mailto:org@oxfordresearchgroup.org.uk); [www.oxfordresearchgroup.org.uk](http://www.oxfordresearchgroup.org.uk)

REGISTERED CHARITY NO. 299436

**Citizens' Nuclear Information Center** is an anti-nuclear public interest organization dedicated to securing a safe, nuclear-free world. It was established in 1975 in Tokyo to provide reliable information and public education on all aspects of nuclear power to ultimately realize this goal.

Our basic stance is as follows:

- Nuclear energy should be abandoned as soon as possible.
- The reprocessing of spent nuclear fuel and the program to use MOX fuel in Light Water Reactors should be stopped immediately. Other programs to use plutonium fuel, such as the fast breeder reactor program, should also be terminated.
- The people who produce radioactive waste should be held responsible for managing this waste.
- We must extract ourselves from the dangers of excessive consumption of energy.
- We oppose the export of nuclear reactors and associated parts and technology.

CNIC is independent from government and industry and is supported by membership fees, donations, and sales of publications.

Citizens' Nuclear Information Center

3F Kotobuki Bldg., 1-58-15 Higashi-nakano, Nakano-ku, Tokyo, 164-0003, Japan

Tel: 81-3-5330-9520; Fax: 81-3-5330-9530

Email: [cnic@nifty.com](mailto:cnic@nifty.com)

<http://cnic.jp/english/>