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# Japan

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## CHAPTER TWO

# Japan

For much of the past half-century, Japan has been considered to be a likely candidate for nuclear proliferation. It has both the means and the motive to do so. The nation's highly developed industrial base features advanced nuclear technologies, including those for both uranium enrichment and plutonium reprocessing. It has had contentious relations with nuclear-armed neighbours, first the Soviet Union, then China and now also North Korea. Yet for 50 years, constraints on nuclearisation have outweighed the motivations. An aversion to nuclear weapons in light of Hiroshima and Nagasaki remains strong among the citizenry and the scientific community, and this is reinforced by law and practice. Going nuclear would have prohibitively high opportunity costs in terms of commerce, diplomacy and national security. Every government examination of the nuclear question over the years has thus reached the same conclusion: it is wiser for Japan to rely for its ultimate security on the US alliance than to seek an indigenous nuclear deterrent. Yet Japan has in the meantime employed a quasi nuclear-hedging strategy that would enable a quick-start nuclear-weapons programme, should circumstances dramati-

cally change for the worse. Ensuring that the country does not develop nuclear arms therefore depends to a great extent on the credibility of the US extended-deterrence commitment, which shows no sign of ebbing.

## History

During the Second World War, the Japanese imperial army and navy pursued parallel nuclear-weapons programmes. The army's 'Project Ni' was based on the gas-diffusion method of uranium enrichment; the navy's 'Project F' focused on gas-centrifuge-enrichment technology. Impeded by material shortages and competing government priorities, neither project progressed beyond the laboratory stage, although Japanese scientists did learn how to trigger a fission reaction, and the amount of uranium required for a bomb.<sup>1</sup>

Japanese interest in nuclear weapons reawakened a decade later, encouraged by the US and France. The US Joint Chiefs of Staff considered in the late 1950s transferring nuclear weapons to the Japan Self-Defense Forces (JSDF), under a scheme similar to NATO's nuclear-sharing arrangements.<sup>2</sup> Prime minister Nobusuke Kishi, in office from 1957 to 1960, believed that Japan needed to possess nuclear weapons if it was to have global influence.<sup>3</sup> In the early 1960s, his successor, Hayato Ikeda, also expressed an interest in nuclear arms.

Nuclear weapons were introduced to US-occupied Okinawa in December 1954, amid a US–China crisis over the Taiwan Strait. By 1967 about 1,200 of the nuclear gravity bombs were deployed at Kadena Air Base, though they had been removed by the time that Okinawa reverted to Japanese control, in May 1972. The Pentagon also transferred non-nuclear components of such weapons to US bases in Japan itself, in the hope that complete weapons eventually could be deployed there.<sup>4</sup> Meanwhile, under a secret clause of the US–Japan Security

Treaty (see below), US bombers and warships transited Japan while carrying nuclear weapons.

China's nuclear test in October 1964 prompted prime minister Eisaku Sato to tell US ambassador to Japan Edwin Reischauer that Tokyo should have nuclear weapons too.<sup>5</sup> Follow-on discussions with US president Lyndon Johnson and the US secretary of defense Robert McNamara, suggest, however, that Sato's reference to nuclear weapons was a diplomatic ploy designed to strengthen Washington's deterrence promise – and, indeed, the promise was strengthened.<sup>6</sup>

### **Nuclear studies**

In the late 1960s and early 1970s, amid a public debate sparked by China's nuclearisation and international negotiation of the 1968 Non-Proliferation Treaty (NPT), at least five different government-related studies assessed the pros and cons of developing nuclear weapons. They all concluded that the best option was continued reliance on US nuclear deterrence. In 1967–68, a quasi-private study group called Anzen Hoshou Chousa Kai (Research Commission on National Security) concluded that a plutonium-based bomb would be easier to produce than one using highly enriched uranium (HEU); that the nation's first nuclear-power reactor, at Tokai Village, could be used to produce 20 bombs' worth of weapons-grade plutonium per year from indigenous natural uranium; and that Japanese companies and research institutions possessed the bomb-making technologies necessary to the effort. The study argued against such a course due to the huge production costs it would entail and the negative impact it would have on Japan's diplomatic relations.<sup>7</sup>

A second study – initiated by the Cabinet Research Office in 1967 and sometimes called the 1968/1970 report because it was completed in two parts in those years – similarly concluded that

nuclearisation was 'possible and rather easy', but not desirable. Developing a nuclear deterrent would be enormously costly and politically divisive. It would also spark regional suspicion and result in diplomatic isolation. Other risks included the geological dangers of conducting underground nuclear-explosion tests on a seismically active archipelago. Given the concentration of its population in a relatively small area, Japan would remain vulnerable to a first strike from China even if it acquired a small nuclear force. This was precisely the conclusion that Sato's government had hoped for from the study, as it countered arguments from domestic pro-nuclear advocates and helped allay foreign concerns that Japan might head down the path to a nuclear weapon.<sup>8</sup> A 1969 study by the National Institute for Defense Studies, under the Japan Defense Agency (JDA), reached similar conclusions.<sup>9</sup>

Complementing the main recommendation, the 1968/1970 report also advocated a nuclear-hedging strategy. It judged it 'vital' that Japan achieve a sufficient degree of nuclear independence, for both military and economic security. The authors thus recommended that Japan build gaseous-diffusion uranium-enrichment plants to reduce dependence on US-origin uranium.<sup>10</sup>

A fourth study – this one produced by the Ministry of Foreign Affairs' Foreign Policy Planning Committee, and thus more official than the others, but termed a 'research paper' rather than a statement of policy – similarly concluded in 1969 that Japan should maintain its non-nuclear stance for the time being, while maintaining the latent economic and technical ability to produce nuclear weapons if such action was warranted by international developments. Given the overlap between civilian and military uses of nuclear power, so the argument went, signing the NPT would not prevent Japan from having a nuclear option, which could be put into play

in ten years' time. Summarising the study, one foreign-ministry official wrote, 'we will continue to use nuclear power for peaceful purposes, on the one hand. On the other, we should be in a position where we can continue to develop fast-breeder reactors and other relevant installations so as to make nuclear weapons instantly in case of need.'<sup>11</sup>

An official study commissioned in 1970 by director general of the JDA Yasuhiro Nakasone, and produced in 1972 as a White Paper, also concluded that nuclear-weapons development would be ineffective because of the cost – consuming 40% of the defence budget for five years – and the absence of a nuclear test site. Producing 'defensive' nuclear weapons would invite an adverse foreign reaction and risk triggering war, the White Paper concluded. Nakasone, who had earlier been drawn to the idea of indigenous nuclear weapons, thus developed second thoughts.<sup>12</sup>

Government-sponsored studies on the desirability of indigenous nuclear weapons were again undertaken in the 1990s when the end of the Cold War, North Korea's nuclear quest and China's military modernisation changed Japan's security environment for the worse. The most widely discussed report was commissioned by the JDA, apparently with the intention of proving the negative consequences of a nuclear option.<sup>13</sup> As with previous government reports, it concluded in 1995 that joining a nuclear arms race would be strategically unwise and hugely expensive. The report foresaw no possibility of a conflict with China that would involve nuclear weapons. Interestingly – and wrongly, as it turned out – the report also judged that it was unlikely the US would allow North Korea to become nuclear-armed.<sup>14</sup>

The most recent government study that has come to light about the feasibility of nuclearisation was written in 2006, entitled 'On Japan's Capability for the Domestic Production

of Nuclear Weapons'. Commissioned by a senior government official, it concluded that Japan had the technical expertise and facilities to develop a small nuclear warhead and that the nation's M-V and H2-A rockets had potential intercontinental ballistic missile (ICBM) capabilities, but that developing a prototype weapon would take at least three to five years, cost ¥200–300 billion (US\$1.75–2.5bn) and require hundreds of experts and engineers. The journalist who revealed the report assumes it was produced without the knowledge of government leaders by bureaucrats who wanted to be in a position to offer analysis in the event that they were asked about the nation's latent nuclear capability.<sup>15</sup>

The key takeaway here is that every time the government commissioned a study, the conclusions were the same: going nuclear was neither desirable nor necessary as long as Japan could rely on the US defence commitment. None of the internal assessments were undertaken in order to justify nuclear weapons or because government leaders doubted their non-proliferation course. The purpose, rather, was to take stock at times of a new security environment and, by quietly leaking the assessments, to reassure concerned neighbours and friends of Japan's steadfast non-nuclear-armed posture while also reminding them of Japan's nuclear potential. This typically served to encourage the US to reaffirm its extended-deterrence commitment. Meanwhile, a nuclear-hedging strategy was never questioned and was sometimes explicitly recommended.<sup>16</sup>

## Policies

Japan has adopted various legal and political constraints on not acquiring nuclear weapons. The 'Basic Law on Atomic Energy', enacted in 1955, mandates that the research, development and utilisation of atomic energy must be limited to peaceful purposes. In June 2012, the national Diet (parliament)

added a supplementary provision to the Basic Law to insert the words 'national security' as an aim of the safe use of nuclear energy. Critics claimed that this change allowed for nuclear technology to be used for military purposes.<sup>17</sup> The government and the lawmaker from the conservative Liberal Democratic Party (LDP) who initiated the change, which was done without any parliamentary debate, claimed the intention was to refer to nuclear security, including anti-terrorism.<sup>18</sup> If so, the wrong phrase was used.

Contrary to common wisdom, the legal restrictions do not include a constitutional prohibition of nuclear weapons. Article 9 of Japan's constitution renounces war as a 'sovereign right of the nation and the threat or use of force as means of settling international disputes'. After the Korean War, clause 2 of Article 9, which says 'land, sea, and air forces, as well as other war potential, will never be maintained' was interpreted to allow 'military capability that does not exceed the minimum necessary level for self-defence'. This enabled establishment of the JSDF. In 1957, Kishi stated that nuclear weapons were permissible under this interpretation, provided that they stayed within the scope of the 'minimum necessary level for self-defence'. In 1965, the Cabinet Legislative Bureau (CLB), a body in the executive branch that has de facto authority over constitutional interpretation, confirmed this interpretation. Five years later, the JDA formalised this in doctrine, saying that a small-yield nuclear weapon would be within the minimum force level required for self-defence. The interpretation was repeated in the Diet in 1978 and 1982 by the CLB and in 2006 by Prime Minister Shinzo Abe.<sup>19</sup>

Notwithstanding the constitutional allowance for nuclear weapons, since 1971 successive Japanese prime ministers have adhered to restrictive non-nuclear policies. The basis for the set of policies is the 'Three Non-Nuclear Principles' introduced by



Sato in December 1967, formalised by a Diet resolution in 1971, and confirmed by successive cabinets. They prohibit Japan from manufacturing, possessing or permitting the entry of nuclear weapons into the country, or its airspace or territorial waters. Although Diet resolutions are legally non-binding, the Three Non-Nuclear Principles are regarded by many Japanese as a morally binding norm.<sup>20</sup>

Soon after he introduced the Three Non-Nuclear Principles, Sato became concerned that pacifists were using them to weaken the US nuclear guarantee. He thus announced in the Diet in March 1968 a new nuclear-policy formulation called the 'Four Pillars Nuclear Policy' to: 1) limit the use of nuclear energy to peaceful purposes as regulated by the 1955 Atomic Energy Basic Law; 2) pursue global nuclear disarmament; 3) rely on US extended deterrence for protection against nuclear attack; and 4) support the Three Non-Nuclear Principles 'under the circumstances where Japan's national security is guaranteed by the other three policies'.

Sato's four pillars for the first time explicitly stated Japan's dependence on US extended deterrence. They also introduced a conditionality to the Three Non-Nuclear Principles, keeping the nuclear option open in the event that Japan's security was not guaranteed by US extended deterrence.<sup>21</sup>

In actuality, the Three Non-Nuclear Principles are two and a half in number. A secret agreement dating from the early 1960s, which came to light four decades later, allowed US warships carrying nuclear weapons to make calls in Japanese ports.<sup>22</sup> Sato originally planned on only the first two principles; the third principle, on the entry of nuclear weapons, was added under pressure from other cabinet and party members.<sup>23</sup> But tacit permission was given to the US Navy over the years to carry nuclear weapons while in port and in order to strengthen the US extended deterrence. The foreign minister's private

advisory board in 2003 thus recommended formally redefining the policy as the '2 ½ non-nuclear principles'. No action was taken on this recommendation.<sup>24</sup> In March 2010, however, when asked in Diet debate what Japan would do if threatened with nuclear weapons, foreign minister Katsuya Okada from the leftist Democratic Party of Japan said 'if Japan's security cannot be protected without temporary calls by US vessels carrying nuclear weapons, the government would have to make a decision even if it has political consequences'. His words were common sense and simply expressed what has been de facto policy for many years. Nevertheless, it was interesting that Okada, who as noted below has strong disarmament inclinations, should have been the one to say it in the Diet, and thereby codify the policy.

### **Treaties and other international obligations**

Although Japan today is a leading champion of the NPT, this was not always the case. It took Japan 18 months to sign the treaty after it was opened for signature on 1 July 1968, and another six years to ratify the NPT. The reasons for hesitation were mixed. Many Japanese resented the treaty's inequity between nuclear 'haves' and 'have-nots' and feared the former would never disarm. There was a concern that giving up a nuclear option would forever assign Japan to a second-class global status, while nuclear-armed states, particularly China, maintained power to exert their will. For reasons of national security, policymakers wanted to keep a nuclear-weapons option for the future. Senior Foreign Ministry officials told US counterparts that Japan might need to consider nuclear weapons if India or other non-NPT signatories became nuclear-armed or if China's nuclear threat were to increase.<sup>25</sup> There was also a strong commercial motivation not to be treated disadvantageously vis-à-vis Europe's nuclear industry in terms of

international inspections and access to advanced nuclear technologies.

During negotiations on the treaty, the US assured both Japan and West Germany that Article IV would not interfere with dual-use civil nuclear programmes.<sup>26</sup> Allowances for reprocessing in particular were reaffirmed before Japan ratified the treaty. Upon signing the NPT in February 1970, Japan attached a statement reflecting its interpretation that the only proscribed nuclear activities were acquisition or control over nuclear weapons or explosive devices and that the pursuit of peaceful nuclear activities by non-nuclear weapons states could not be subject to discriminatory treatment, even if such activities could have a dual use in weapons development. The statement stipulated that the NPT should be the first step toward complete nuclear disarmament. The statement also reaffirmed Japan's right to withdraw from the treaty under Article X if the 'supreme interests of the nation' were endangered.

Despite the reassurances Japan received in connection with signing the NPT, it still took six years to develop a consensus on ratification, which raised doubts internationally about Japan's intentions. Indeed, some conservative forces within the governing LDP remained opposed because they wanted a nuclear option, while some leftist forces opposed ratification because the treaty allowed five states to remain nuclear-armed. Equal treatment with the European Atomic Energy Community (Euratom) was not assured until a safeguards agreement was negotiated with the International Atomic Energy Agency (IAEA) in 1975 and signed the next year. Lingering worries about the credibility of the US alliance in the aftermath of president Nixon's 1972 visit to China and the suspension of dollar-gold convertibility, neither with prior consultation, may have contributed to the delay.<sup>27</sup>

When the NPT came up for indefinite extension in 1995, there remained some hesitation in Japan on the grounds that the US nuclear umbrella could not always be relied upon and that an indigenous option therefore should not be given up forever. Under pressure from the US and other states, Japan supported indefinite extension, but referred publicly to the NPT withdrawal clause, as noted below.

Over the following years, Japan adopted other international instruments that strengthened its non-proliferation commitments. In 1996, Japan was among the first to sign the Comprehensive Nuclear Test-Ban Treaty (CTBT), which it ratified the next year. In 1999, Japan became the first country with a fully developed nuclear fuel cycle to have in place the Additional Protocol, the IAEA's strengthened safeguards system. Four and a half years later, the IAEA drew the 'broader conclusion' under the Additional Protocol that all nuclear material in the country remains in peaceful activities, a conclusion that has been reached every year since.

The IAEA keeps an office in Japan exclusively for safeguards in that country, which accounts for nearly 17% of the IAEA's safeguards budget – more than any other state. Further attesting to Japan's non-proliferation reputation, a Japanese citizen, Yukiya Amano, has headed the IAEA since 2009. Earlier, Japan was a founding member of the Zangger Committee (1971) and of the Nuclear Suppliers Group (1974), both of which seek to control the export of materials and equipment that could be applicable to the development of nuclear weapons.

Over the past three decades, Japan's international disarmament activism has generally increased. Since 1983, the Foreign Ministry has sponsored study visits to Hiroshima and Nagasaki through the United Nations Programme of Fellowships on Disarmament for diplomats from 150 countries. Annually since 1989, the ministry organises a UN Conference on Disarmament

in a different Japanese city, with international experts. Japan financed a large percentage of the cost of the negotiations that led to the CTBT in 1998. It also funded negotiations for the Central Asian Nuclear-Weapons Free Zone.

Among the latest of Japan's disarmament initiatives was a 'Nuclear Disarmament and Non-proliferation Policy Speech' by Foreign Minister Fumio Kishida in January 2014 calling for nuclear-weapons states to reduce the role of nuclear weapons for consideration 'only in extreme circumstances based on the right of individual or collective self-defence'. Giving the speech in his home town of Nagasaki, Kishida naturally played up Japan's experience of being the only country to suffer the wartime use of nuclear weapons. Japan's emphasis on keeping alive the memory of Hiroshima and Nagasaki underscores its disarmament inclinations and contributes to the international disarmament movement.

At the same time that it promotes global nuclear disarmament, Japan relies on the US nuclear deterrent. As political scientist Nobumasa Akiyama puts it, the nation is 'caught between a moralistic view on nuclear weapons and the reality of today's security environment'.<sup>28</sup> The dichotomy often comes under the spotlight with regard to public statements. In 2009, for example, foreign minister Okada, who, as noted above, was the first to admit publicly that the Three Non-Nuclear Principles were not absolute, advocated that the US adopt a 'no first-use' policy with regard to nuclear weapons. The stance was opposed by bureaucrats who feared it would erode confidence in the US security guarantee.<sup>29</sup>

It was not surprising, therefore, that, in 2012, after the LDP had returned to power, the government declined to join an international statement declaring that nuclear weapons are inhumane and should not be used under any circumstances. Yet in 2013 Japan signed a similarly styled joint statement;

the incorporation of a few word changes to the text gave the government a fig leaf to justify the shift. At the same time, Japan signed a separate statement that noted the importance of recognising the security dimension, as well as the humanitarian concern, in the nuclear-weapons debate. Japan was the only country to sign both statements.<sup>30</sup>

The apparent contradiction of simultaneously promoting nuclear disarmament and nuclear deterrence might be seen to reflect psychological yin–yang impulses seeking both peace and protection. Japanese thinking on disarmament and deterrence has become more integrated, however. Today, both are rooted in fear of China. Promoting nuclear disarmament and transparency are tools for the Foreign Ministry to seek to contain China’s nuclear build-up.<sup>31</sup>

### **Evolving defence policies**

Many Koreans and Chinese believe that recent changes in Japan’s defence policies could lead to a change in the non-nuclear stance as well. In recent years, Japan has shed most of the constraints that defined its defence policy for the majority of the Cold War era.<sup>32</sup> A prohibition on foreign deployment was lifted in 1992 to enable the JSDF to join a UN peacekeeping mission to Cambodia. Although JSDF peacekeeping forces have typically been deployed unarmed, in 2004–06 Japan sent an armed JSDF contingent to assist the US-led reconstruction of Iraq in a humanitarian role. A ban on power projection was effectively loosened in 2001 to procure in-flight refuelling tankers and later to produce helicopter destroyers, which are akin to aircraft carriers. And a ban on the military use of space was changed in 2008 to enable Japan to employ sophisticated military satellites.

In the defence development realm, a ban on joint military research was lifted in 2003 when Japan announced that it would

explore the joint development of ballistic-missile defence with the US, and an arms export ban was lifted in 2014, when Japan announced it would supply missile interceptor parts to the US and the United Kingdom. Meanwhile, subordination of the defence establishment was changed in 2007 when the JDA was upgraded to a ministry.

A former South Korean ambassador to Japan, Kwon Chul-hyun, concluded in 2012 that Japan was 'getting rid of the obstacles one by one as the opportunity offers. In the long term, I guess it is preparing for a nuclear weapon.'<sup>33</sup>

All of these changes have made Japan more of a 'normal' military power commensurate with its leading economic status. The evolution has accelerated since Abe became prime minister for the second time in December 2012. In particular, he has sought to push through the reinterpretation of the constitution to allow exercise of the right of collective self-defence if an ally is attacked. The reinterpretation, as decided ad referendum by the cabinet in July 2014, to allow use of force in defence of an ally is constrained by three conditions. There must be: 1) a clear danger to the Japanese people's right to 'life, liberty and happiness'; 2) no other appropriate means to repel an attack and ensure Japan's survival; and 3) a limit on the use of force to the minimum extent necessary. The reinterpretation was approved by the Diet in September 2015, but not without an intense political fight and more than 60% opposition in public opinion polls.

The nuclear taboo is of another order of magnitude and remains firm. As political scientist Etel Solingen notes, becoming 'normal' is not necessarily a prelude to becoming 'nuclear'; for the vast majority of states, 'normal' means being non-nuclear.<sup>34</sup> According to a close adviser to Abe, the prime minister has no interest in acquiring nuclear weapons.<sup>35</sup> Even if Abe wanted to, Japanese political and societal dynamics would constrain

any such impulse, short of some catalysing event. As a group of leading American foreign-policy experts concluded after an October 2014 visit to Japan: ‘the Japanese public and much of the ruling elite continue to be strongly unwilling to take risks or to significantly change a tradition of peaceful development and positive contributions to both the region and the international community that has become firmly rooted in Japan over the past 70 years.’<sup>36</sup>

### **Nuclear hedging**

For much of the past half-century, Japan has had a quasi nuclear-hedging strategy, usually implicit in nature, which is the flip side of its posture of nuclear restraint. Some analysts disagree with the hedging interpretation. International relations scholar Jacques Hymans sees Japan’s nuclear policy mix as the result of ‘powerful forces of inertia’, for example.<sup>37</sup> But many policymakers appear to quietly understand the hedging strategy. Japanese officials occasionally express it explicitly, with varying degrees of frankness and political acceptability.

As with Sato’s 1964 comments about seeking nuclear parity with China, the hedging strategy is often seen as a means of diplomatic leverage. In an internal 1971 personal memo, Takuya Kubo, a senior JDA official, contended:

If Japan prepares latent nuclear capability by which it would enable Japan to develop significant nuclear armament at any time ... the United States would hope to sustain the Japan–US security system by providing a nuclear guarantee to Japan, because otherwise, the US would be afraid of a rapid deterioration of the stability in ... international relations triggered by nuclear proliferation.<sup>38</sup>



In his memoirs published in 1983, Kishi wrote in connection with a visit to the newly established Japan Atomic Energy Research Institute at Tokai in January 1958 that while Japan would concentrate on the peaceful uses of its nuclear technologies, 'as the level of our nuclear technologies increases for peaceful purposes, it will increase for military purposes, too'. He added that 'even without nuclear weapons, Japan would have a stronger say in the international arena – as in arms control and nuclear test-ban issues – by improving its nuclear latency potential'.<sup>39</sup>

At other times, hedging statements have more directly foreseen a potential need for nuclear weapons. In 1967, ambassador to the US Takeso Shimoda sparked a controversy by saying that, because the evolution of China's nuclear threat could not be predicted, 'the choice of whether or not Japan may become a nuclear weapon state should be left in the hands of Japan's future generation'.<sup>40</sup> The next year, agriculture and forestry minister Tadao Kuraishi had to resign for advocating an indigenous nuclear deterrent to protect Japanese fishermen from the perceived Soviet threat.<sup>41</sup> His was a unique case of a cabinet member calling for nuclear-weapons development, not just hedging.

In the past two decades, Japanese leaders have spoken more frequently about a nuclear capability. In July 1993, in the context of stating support for indefinite extension of the NPT, foreign minister Kabun Muto reminded Japanese reporters of the Article X withdrawal clause. He added: 'If North Korea develops nuclear weapons and that becomes a threat to Japan, first there is the nuclear umbrella of the US upon which we can rely. But if it comes down to a crunch, possessing the will that "we can do it" is important.'<sup>42</sup> In 1994, in response to a question in the Diet, prime minister Tsutomu Hata made an unprecedented statement to the effect that 'Japan has the capa-

bility to produce nuclear weapons'. Backtracking from what was said to be a 'slip of the tongue', the Foreign Ministry issued a statement saying 'mere possession of high-level nuclear technology and scientific technology does not signify the capability of producing nuclear weapons'. It then added: 'Japan does not have any expertise or experience in producing nuclear weapons. This means that Japan does not have the capability to produce them.'<sup>43</sup>

Four years later, former prime minister Morihiro Hosokawa referred to the latent capability when he wrote: 'It is in the interest of the United States, so long as it does not wish to see Japan withdraw from the NPT and develop its own nuclear deterrent, to maintain its alliance with Japan and continue to provide a nuclear umbrella.'<sup>44</sup> Hosokawa's statement reflects a consistent Japanese preference for relying on the US nuclear umbrella over indigenous nuclear development. It also repeated a consistent pattern of using the recessed nuclear capability as leverage to ensure the continued strength of the US commitment.<sup>45</sup>

Soon after Hosokawa's article was published, North Korea's test launch of a *Taepodong* missile that overflowed Japan sparked a debate about nuclearisation in Japan. Prime Minister Keizo Obuchi reiterated the nation's non-nuclear weapons principles, but the next year right-wing parliamentary vice minister of defense Shingo Nishimura said in an interview that 'Japan may be better off if it armed itself with nuclear weapons' and that failure to do so left the nation vulnerable to international 'rape', comments for which he was dismissed.<sup>46</sup>

Comments about nuclear hedging accelerated in 2002. In April, leader of the opposition Liberal Party Ichiro Ozawa said he told Chinese leaders in Beijing that, 'if Japan desires, it can possess thousands of nuclear warheads. Japan has enough plutonium in use at its nuclear plants for three to four thousand. If that should happen, we wouldn't lose [to China] in

terms of military strength.<sup>47</sup> In May, chief cabinet secretary Yasuo Fukuda suggested that Japan might reconsider its decade-long commitment to the three nuclear principles if the international security environment changed dramatically for the worse.<sup>48</sup> In June, prime minister Junichiro Koizumi sought to close the issue by calling Fukuda's comments a 'slip of the tongue' and repeating the non-nuclear principles, but he added a hedging comment: 'it is significant that although we could have them, we don't.'<sup>49</sup> The next year both Fukuda and deputy chief cabinet secretary Shinzo Abe said that, while the cabinet had no intention of developing nuclear weapons at present, future makers of foreign policy should have the right to decide that question.<sup>50</sup>

Kyorin University professor Tadae Takubo and former Japanese ambassador to Poland, Nagao Hyodo, made the point more bluntly when they wrote that international politics was dominated by the principle of 'never say never' and that Japan should never say that it will never have nuclear weapons.<sup>51</sup>

North Korea's nuclear test in October 2006 ended Japan's taboo on discussing nuclear-weapons options. Foreign minister Taro Aso called for a public debate on the conditions that should trigger reconsideration of the non-nuclear policy. His main intent, however, was probably to elicit US confirmation of its extended-deterrence commitment, which indeed was dutifully repeated by secretary of state Condoleezza Rice in a visit to Tokyo that month.

In the wake of the Fukushima nuclear disaster in 2011, when many Japanese questioned the merits of nuclear power, former defence minister Shigeru Ishiba said 'We should keep [the] nuclear fuel cycle, which is backed by enrichment and reprocessing' in order to maintain 'technical deterrence'.<sup>52</sup> In two editorials, *Yomiuri Shimbun*, Japan's largest circulation newspaper, echoed Ishiba's call, saying that the nation's stockpile

of plutonium 'functioned diplomatically as a potential nuclear deterrent'.<sup>53</sup> Before becoming defence minister in 2012, Satoshi Morimoto similarly said that commercial nuclear power reactors have 'very great defensive deterrent functions'.<sup>54</sup>

Such statements are sometimes referred to as a 'bomb in the basement' deterrence strategy, to keep potential adversaries such as China and North Korea guessing about Japan's capabilities.<sup>55</sup> As one Japanese defence official told this author, 'if China thinks the reprocessing is a deterrent, fine'.<sup>56</sup> The hedging strategy also requires maintenance of the capabilities. In 2014, a well-placed Japanese foreign-ministry official was reported to have informally asked US deputy secretary of energy Daniel Poneman to continue to allow Japan to reprocess plutonium because it was important for both energy security and national security. The official said US continued support for reprocessing was a fundamental of the US–Japan alliance.<sup>57</sup>

### Capabilities

While the intentions behind Japan's nuclear-hedging strategy are often kept hidden, the capabilities are clearly visible. Japan has the largest number of civilian nuclear facilities of any non-weapons state and is the only one with complete fuel-cycle technologies, including both enrichment and reprocessing. A robust space launch programme adds a potential delivery capability to the nuclear latency. These capabilities are all dual-use; in the post-war period Japan has never been known to pursue any exclusively military-related nuclear technologies.<sup>58</sup> It has no known expertise in nuclear weaponisation or military involvement in nuclear technology. The transparency of the nuclear activities and the nation's unsullied record of cooperation with the IAEA provide confirmation that Japan does not have a nuclear-weapons programme. The quasi-hedging strategy only keeps options open for the future. Nuclear-policy

expert James Acton calls this strategy 'existential hedging': maintaining a nuclear infrastructure without a deliberate policy to enable rapid proliferation.<sup>59</sup>

In this sense, nuclear hedging was a secondary rationale behind the nuclear capabilities. Energy security was the primary purpose.<sup>60</sup> For a country with no oil and limited coal reserves, nuclear energy was seized upon in the 1950s as a secure energy source. It was a far better means of seeking energy autonomy than the expansionist policies of the late 1930s and the disastrous war Japan began in 1941 to escape the Allied oil embargo.<sup>61</sup> The first nuclear power plant was built in Tokai in 1966, and before the Fukushima accident in 2011, 54 were operating. By 1998, nuclear power contributed 37% of the nation's electricity generation. This percentage fell to 29% in the following few years but was expected to increase to 40% or more by 2017. After Fukushima, however, all of Japan's nuclear reactors were shut down for safety checks. In mid-August 2015, just one was re-started. The cost of substituting more fossil fuel imports was US\$156 million in the first three years after the accident.<sup>62</sup>

### **Closed fuel cycle**

From the beginning in the mid-1950s, Japan's nuclear energy policy aimed to achieve a fully independent closed fuel cycle through recycling of spent fuel, in line with the practice of the US, its main technology supplier.<sup>63</sup> Japan saw the closed fuel cycle as a route toward energy self-sufficiency and as a hedge against global shortages of uranium, which in the early years of the nuclear age was wrongly assumed to be scarce. A more recent justification is to reduce the amount of spent fuel requiring disposal.

As a long-term goal, Japan aspires to develop fast-breeder reactors (FBR) that would produce more plutonium than consumed and thereby reduce uranium requirements by up

to 60 times while also reducing nuclear waste.<sup>64</sup> As part of the research and development (R&D) programme to develop a commercial FBR, in the 1970s and 1980s small prototype reactors were built in Ibaraki prefecture (an area formerly called *Joyo*, after which the reactor was named) and Fukui prefecture (where the reactor was named *Monju*).

The FBR project experienced severe technical trouble, however, and, like fast-breeder aspirations in other countries, shows no prospect of ever becoming commercially viable. In 1995, a leak of the molten sodium that was used to cool the extremely hot reactor stopped operation of *Monju*, which has remained closed ever since due to safety concerns and a high-court ruling (molten sodium is a poisonous element that explodes upon contact with water.) Operations at *Joyo* were suspended in 2007 after an accident and have not yet been resumed. In 2014, the government decided to continue the fuel cycle programme but to use *Monju* as 'an international research centre for technological development, such as reducing the amount and toxic level of radioactive waste and technologies related to nuclear non-proliferation' rather than as a prototype for a commercial FBR.<sup>65</sup>

Meanwhile, Japan is proceeding with an interim plan, introduced in 1997, to recycle uranium and plutonium in spent fuel, involving separating it at reprocessing plants, and then mixing plutonium with uranium to produce mixed-oxide (MOX) fuel. This fuel would be burned in 16 to 18 specially designed power reactors, saving about half of the uranium that would otherwise be used.<sup>66</sup> The reprocessing project and MOX fuel plans have also run into major trouble, resulting in repeated delays and massive cost overruns.<sup>67</sup> Seemingly insolvable technological and political problems have also resulted in a huge stockpile of plutonium which, being weapons-usable, gives rise to proliferation concerns.

Uranium-enrichment technology provides Japan with a potential second path to a bomb. R&D on gas centrifuge uranium enrichment for civilian purposes began in 1979 at a demonstration plant in Ningyo-toge in Okayama prefecture. As with reprocessing, the purpose was to close the fuel cycle and thereby give Japan a degree of nuclear fuel independence. The first-generation industrial-sized enrichment was established in Rokkasho with a capacity of up to 1,050 ton-separative work units (SWU)/year. It operated between 1992 and 2010 but was never commercially viable as the centrifuges, with rotors made of maraging steel, repeatedly malfunctioned. A second enrichment plant using composite carbon-fibre rotors began operations at Rokkasho in 2011. The 1,500 ton-SWU capacity of the plant was to be sufficient for about one-third of Japan's pre-Fukushima low-enriched uranium (LEU) fuel requirements. The LEU produced there is not commercially competitive with prices on the international market. Yet the plant has been justified because it also has the purpose of further enriching the 700kg of 1.3% LEU that would otherwise be unused as a by-product of reprocessing.

### **US support for reprocessing**

An experimental plutonium reprocessing plant was built at Tokai in 1975 and began operation in 1977. It has a capacity annually to process 210 tonnes of spent fuel and to produce about 450kg of separated plutonium. After the plant was finished at a cost of US\$170m and 14 years of effort, a diplomatic issue threatened to prevent it from operating at all. In 1976 the US, which until then had promoted plutonium reprocessing for its recycling benefits, changed its policy. India's 1974 test of a nuclear device using plutonium produced and separated in ostensibly civilian facilities had shocked the US nuclear and foreign-policy communities. Plans by France and Germany

to sell reprocessing technology to Argentina, Brazil, Pakistan, South Korea and Taiwan, all of whom were seen as potential proliferators, exacerbated concerns. With plutonium management becoming a political issue in the 1976 election, president Gerald Ford embargoed the export of reprocessing and enrichment technology and called on all states to accept a three-year moratorium on reprocessing. Jimmy Carter, who succeeded Ford in 1977, strengthened the policy shift, deferring domestic commercial reprocessing indefinitely and indicating that the US would seek to persuade other nations to follow suit.<sup>68</sup>

The policy shift came at an inopportune time for Japan, which was seeking consent to reprocess US-origin spent fuel at Tokai, and also permission to transfer excess spent fuel to the UK and France for reprocessing. When prime minister Takeo Fukuda raised the issue on a Washington visit, Carter handed him an internal report that recommended ceasing reprocessing. Carter's stance was seen as a threat to Japan's energy security and as a betrayal of America's previous encouragement of the nation's closed fuel cycle plans. According to Kumao Kaneko, a former Foreign Ministry official involved in the talks with the US, one reason Japan pressed for permission to reprocess plutonium was to ensure that Japan had a weapons option.<sup>69</sup> Japanese officials continued to lobby furiously and persuaded US Ambassador to Japan Mike Mansfield to weigh in personally with Carter to seek a compromise in order to preserve the health of the alliance. Gerard Smith, former director of the Arms Control and Disarmament Agency who was brought in to lead the negotiations with Japan, reminded Carter that threatening Japan's energy security in 1941 by cutting off its oil supplies had led to war.<sup>70</sup> It was also recalled that Japan was persuaded to sign the NPT only after its access to reprocessing was assured.

Carter relented and, after a study by the two countries of potentially more proliferation-resistant reprocessing did not



yield any practical alternatives, he agreed to allow Tokai to reprocess spent fuel over which the US exercised residual control for two years and 99 tonnes per year. A two-year International Nuclear Fuel Cycle Evaluation study did not come up with good alternatives to conventional reprocessing, so Washington extended the agreement three times.<sup>71</sup>

When Ronald Reagan came to office, in 1981, he reversed US plutonium policy again, lifting Carter's ban on commercial reprocessing activities in the US. In order to keep Japan firmly in the anti-Communist camp, he also approved a new policy on foreign reprocessing of plutonium, subject to certain statutory conditions concerning safeguards and physical security. In 1982 the US and Japan began talks on negotiating a new nuclear cooperation agreement that was required in order to meet new conditions of the US Nuclear Non-Proliferation Act of 1978. The resulting agreement, which went into effect in 1988, proved to be advantageous to Japan by granting prior consent for reprocessing of all US-controlled (or 'obligated') material. Reagan's policy principle was that countries that had made huge investments in reprocessing facilities and had a sterling non-proliferation record were to be given advance consent.<sup>72</sup>

Permission was also granted to Japan to send spent fuel to France and the UK for reprocessing. Some of the recovered plutonium and uranium was eventually returned as MOX. In the absence of a functioning breeder reactor and the delay in operating of light-water reactors that could use MOX fuel, however, the plutonium oxide served no immediate purpose in Japan. More than 75% of the nation's separated plutonium remains in France and the UK, under contract to be returned by 2020.

When the Democratic Party recaptured the White House in 1993, Bill Clinton issued a policy statement that said: 'the

United States does not encourage the civil use of plutonium and, accordingly, does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes. The United States, however, will maintain its existing commitments regarding the use of plutonium in civil nuclear programs in Western Europe and Japan.<sup>73</sup> The Clinton administration concluded an agreement with Euratom in which the US gave prior consent to reprocessing along the same lines the Reagan administration had given Japan. These policies have remained in place since.

For both non-proliferation and nuclear security reasons, the US has encouraged Japan not to increase its large plutonium stockpile, which is also Japan's stated policy.<sup>74</sup> Washington has also persuaded Japan to return hundreds of kilograms of weapons-grade plutonium and highly enriched uranium that were transferred to Japan between 1957 and 1994 for civilian research applications under the Atoms for Peace programme, mostly for a Fast Critical Assembly (FCA). The UK also provided 200kg of 93% HEU for use at the FCA. Some of the HEU was returned to the US in small doses over the years.<sup>75</sup> The remaining amount, reportedly 214.5kg as well as 331kg of plutonium, is to be returned by the time of the 31 March–1 April 2016 Nuclear Security Summit in Washington.

The US–Japan nuclear cooperation agreement of 1988 comes up for renewal in 2018, although extension is automatic unless either side decides on termination. To protect against any US inclination to re-examine the conditions and change its policy, some Japanese nuclear bureaucrats argue internally that the government must have a solid plan by 2018 to reduce the plutonium stockpile.<sup>76</sup> One strategy favoured by many technocrats is to give development priority to 'fast reactors' that can consume large amounts of plutonium. Another option is to operate Rokkasho at a lower tempo than now planned.

## Reprocessing plans

US policy under Reagan paved the way for operation of the much larger reprocessing facility under construction at Rokkasho since 1993 at a cost to date of US\$22bn, three times the original estimate. It has the capacity to reprocess 800 tonnes of spent fuel annually, about 80% of the full amount of spent fuel from the 54 nuclear power plants that were operating before the Fukushima disaster. The fissile plutonium output would be 4.4 tonnes/year (or 8 tonnes of total plutonium). Rokkasho was to have begun operations in 1996, but has faced repeated delays due to technical, legal and political complications. Ongoing safety licensing procedures that were made more stringent after the Fukushima disaster have meant further delay. Meanwhile, it was decided in 2014 to permanently shut down the Tokai reprocessing plant, which had ceased operations in 2006.

Once Rokkasho begins operating, the operators plan to run it at a reduced tempo, to reprocess 880 tonnes of spent fuel in the first three years, producing about 4–5 tonnes of separated plutonium. In the same plant, the plutonium will be combined with uranium to produce MOX fuel. Doing this 'under a single roof' is a proliferation and security precaution in order to minimise the potential for diversion or theft of plutonium in transit between the processes.<sup>77</sup> The fuel fabrication is not expected to begin operation until 2018 at the earliest. If reprocessing starts before the MOX is fabricated and then irradiated, the stockpile of separated plutonium will increase.

Rokkasho was built in close consultation with the IAEA, so that the latest monitoring tools could be installed in the process line during construction.<sup>78</sup> Notwithstanding any hedging intentions, Rokkasho is obviously intended for non-military use for the present. As the largest facility ever placed under IAEA safeguards, however, Rokkasho will present safeguards challenges

in terms of both cost – the US\$10m annual safeguards bill will largely be borne by the Japanese government – and confidence in verification. As little as a 1% error in measurement of the plutonium would be equivalent to three bombs' worth.<sup>79</sup> The IAEA is thus readying a basket of verification techniques and technologies to supplement traditional measurement and accountancy methods.

Since 1991, Japan has had an official policy of no surplus plutonium. Any plutonium produced has to have a specific peaceful purpose. In practice, however, Japan has a huge surplus. As of the end of 2014, the plutonium stockpile amounted to 47.8 tonnes, 37 tonnes of which is held in France and the UK.<sup>80</sup> Technical delays in the breeder reactor programme and in developing MOX fuel meant that accumulated separated plutonium was justified as working stocks. The MOX fuel fabrication plant is now scheduled for completion in October 2017. In light of the uncertainties, a 'New Basic Energy Plan', announced in April 2014, repeated the no-surplus-plutonium policy but said the policy would be implemented with 'strategic flexibility'.

Use of the word 'strategic' in the plan had no connotation of national defence considerations but meant that the surplus will grow once Rokkasho comes online. Before the Fukushima disaster, plans called for 16–18 MOX-burning reactors collectively to consume about 5 tonnes of plutonium annually, which would have gradually reduced the stockpile. Operation of a new kind of reactor at Ohma would burn another 1.1 tonnes/year and *Monju* would consume 0.4 tonnes annually. But in light of more stringent safety requirements after Fukushima, less than half of the MOX reactors are expected to come back online. Utilities have applied to re-start seven of them, but even some of these face legal and political obstacles due to opposition by local governments that are alarmed by the negative

connotations of plutonium. New safety checks have also postponed the planned start-up of the Ohma reactor to around 2022, operation of which is also blocked by a lawsuit by the Hakodate city government. As noted above, *Monju* will not be used as part of the recycling programme. Masakatsu Ota, an investigative journalist who specialises in nuclear matters, judges that under the best scenario, only four MOX-burning reactors will come online, consuming no more than 1.6 tonnes/year of plutonium.<sup>81</sup> This is more pessimistic than most estimates, but it is very likely that operation of Rokkasho even at a reduced tempo initially will produce more plutonium than is consumed.

In addition to its inability to reduce the plutonium surplus, the MOX reactor plan is beset by daunting problems. Japan's MOX fuel costs up to nine times more than regular nuclear fuel.<sup>82</sup> It would be far cheaper to dispose of the plutonium through vitrification and burial.<sup>83</sup> For technical reasons, Rokkasho cannot reprocess the spent fuel from MOX reactors, so an additional reprocessing plant would be needed, but currently there is no realistic plan to build one. Separating plutonium for MOX fuel also has inherent proliferation and security risks due to the potential for diversion or theft during processing and storage, even though the transportation risk is reduced by producing MOX under the same roof.

Although long-term direct disposal of spent fuel is logically preferable to reprocessing, no local government in Japan is willing to host a repository. Local politics is also a driver behind the Rokkasho start-up plan. If the facility is terminated, Rokkasho village and Aomori, the prefecture in which it is located, threaten not to accept any more reprocessing waste from France and the UK and to insist on removal of all the spent fuel already stored there. In 2011–12, when the short-lived Democratic Party-led government sought to end both

nuclear power and reprocessing, the Aomori governor essentially blackmailed the central government into continuing the reprocessing plan.<sup>84</sup>

Meanwhile, spent fuel is kept at fuel storage pools at Japan's reactors, some of which are close to full. Local governments of jurisdictions surrounding these reactors are reluctant to allow intermediate dry-cask storage, which can keep larger amounts of spent fuel securely stored for up to 100 years. Ideally, they should be persuaded to do so and Rokkasho operations postponed until there is a realistic plan to reduce the plutonium stockpile. Among the many experts who have studied this complex set of problems, the Princeton University-based International Panel on Fissile Materials in 2013 proposed a thoughtful road map on ways in which Japan could move out of its reprocessing trap.<sup>85</sup> Other experts have suggested that Japan should seek to persuade the UK and France to take ownership of the Japanese plutonium stored there,<sup>86</sup> that the law should be changed to regard the plutonium from spent fuel as a waste product rather than as an asset,<sup>87</sup> and that Japan should put excess plutonium under the custody of the IAEA.<sup>88</sup>

When the new nuclear energy policy was being formulated in spring 2014, some of those involved sought to include a corollary line that the government would take responsibility to reduce the plutonium stockpile. The timing was not propitious, however, because it would have appeared to be in response to criticism from China.<sup>89</sup> In February that year, the Chinese Foreign Ministry had seized upon what was intended to be a good-news story of Japan repatriating weapons-grade plutonium and HEU to the US to criticise Japan's plutonium stockpile.<sup>90</sup>

In light of the engineering and economic failure of Japan's closed fuel cycle, one Japanese policymaker told the current author that 'reprocessing is dead; the facilities are there but the

policy is no longer possible'.<sup>91</sup> Although most Japanese bureaucrats, scientists and politicians associated with the nuclear programme strongly support reprocessing, some Japanese nuclear experts rue the decisions over the years to proceed down this path. In meetings with South Korean counterparts, they are known to recommend that Korea learns from Japan's mistake and does not pursue reprocessing. The remorse they feel is not held widely enough, however, for Japan to abandon the reprocessing programme.

If Japan were to abandon reprocessing, it would constitute a signal contribution to global non-proliferation. A group of distinguished US and Japanese non-proliferation experts recently concluded that Japan's policies have a significant international impact and that, consequently, Japan should give global non-proliferation factors more consideration in what to date has been a debate based on domestic matters.<sup>92</sup> A decision to give up the sunk costs of the Rokkasho reprocessing plant does not appear likely, however. The prevailing mood toward start-up of Rokkasho is 'business as usual'. This leads concerned foreign observers to ask if the reason is for a nuclear hedge.

### **Weapons usability of separated plutonium**

The 11 tonnes of separated plutonium stored in Japan is theoretically enough for nearly 1,400 nuclear weapons based on the IAEA criterion of 8kg of plutonium needed to manufacture a nuclear weapon. The theoretical number is actually closer to 3,000, given that nuclear weapons can be made with as little as 4kg of plutonium each. In terms of technology, there is no doubt that reactor-grade plutonium can be used for nuclear weapons. The US proved this in 1962 with a successful nuclear test using reactor-grade plutonium.<sup>93</sup> The high level of radiation and heat emission from reactor-grade plutonium makes it dangerous to

use, however, and the higher levels of the isotope Pu-240 can lead to pre-ignition and a resultant low yield. Reactor-grade plutonium has thus never been used for weapons.

Some might argue that the reactor-grade plutonium could be used in a crash programme if Japan were in a hurry to produce weapons. In particular, the spent fuel that is removed from the first reload of each reactor has much lower burn-up than the average and thus would be more suitable for weapons. It would be more rational, however, to use super-grade plutonium from the *Joyo* and *Monju* reactors. About 22kg of unseparated plutonium is available from production in the blankets in the *Joyo* reactor in 1977–78 and 62kg from *Monju*.<sup>94</sup> The purity is higher than weapons-grade. It is safeguarded and could not be diverted without the IAEA knowing. Additional weapons-grade plutonium could be produced by inserting a uranium blanket around the core of any other reactor or by simply operating light-water reactors for about 50 days. The low burn-up spent fuel thus produced could be separated in a small reprocessing plant that could be built relatively quickly given Japan's prior experience. A hot cell at Tokai could also be used for reprocessing, although its capacity is limited to about 2kg/year.<sup>95</sup> It is not likely that the Rokkasho reprocessing plant itself would be used, given its inappropriately large size, the need for remodelling if used for weapons purposes and because the facility would probably be deemed to be necessary for civilian reprocessing.

### **Rocket and other technologies**

Japan's nuclear-hedging strategy is reinforced by space-launch-vehicle technologies that with further development could be applied to provide a delivery platform for a nuclear weapon. The three-stage solid-fuel M-V rocket that was developed in 1989 had a 1.8 tonne payload and a thrust on par with US



intercontinental ballistic missiles.<sup>96</sup> When the programme was discontinued in 2006 on cost grounds, some conservative Diet members argued that it should be maintained for its potential military utility.<sup>97</sup> The M-V rockets were not designed for atmospheric re-entry, but re-entry technology has been developed since 1994 and was employed to bring the unmanned spacecraft *Hayabusa* back to earth in 2010. A controlled re-entry of the upper stage of a liquid-fuel H-IIB SLV was also successfully demonstrated in 2011.<sup>98</sup> In addition, with modifications the SM-3 Block IIA missile-defence interceptor that Japan is developing could be used to launch a medium-range ballistic missile.

There is no evidence to suggest that these technologies have been studied in Japan for ballistic missile applications.<sup>99</sup> The rocket designs are not well suited for effective use as ballistic missiles, being too large, for example, for use against nearby China and lacking necessary guidance control.<sup>100</sup> As the American authors of a seminal work on the subject put it in 2003, 'the contention that Japan's SLV program is a disguise for pursuit of a ballistic missile capability is simply absurd'.<sup>101</sup> Some Japanese do claim a hedging purpose, however. Lieutenant-General, Retd Toshiyuki Shikata, who worked as an adviser to the Tokyo Metropolitan Government in 2011, said *Hayabusa* 'sent a quiet message that Japan's ballistic missile capability is credible'.<sup>102</sup>

Even though the M-V has been discontinued for ten years, the space launch programme does provide the technological basis for developing a ballistic missile for military use. American defence policy expert James Schoff estimates that it could be done within two years.<sup>103</sup> In a 2009 study, Schoff noted several other nuclear-weapons-related technologies that have been perfected in Japan's industrial and research communities. These technologies include high-speed framing radiography, heavy-metal shock physics, explosive shaping and radiation

hydrodynamics. These all contribute to Japan's nuclear latency. But Schoff found no indication of an orchestrated programme to develop these technologies as part of a purposeful hedging strategy and he noted that some key weapons technologies, such as metallurgical knowledge, were lacking. He also found that Japanese scientists were keen to demonstrate that they are not engaged in any questionable research and that a wide gulf existed between Japan's scientific research community and the defence establishment.<sup>104</sup>

Among other technologies necessary for a survivable nuclear deterrent, Japan lacks submarines that could be used to launch ballistic missiles. Given the nation's lack of geographic strategic depth, submarine-launched missiles are often deemed to be necessary to provide a second-strike capability. It also has been noted that Japan has no expertise in bomb and warhead design. These technical obstacles could all be surmountable, at least at the initial stage of nuclear deterrence. Rather than submarines, for example, Japan could mount nuclear-armed missiles on cruise ships, or take advantage of its mountainous terrain for tunnelling to hide missiles, as China has done.<sup>105</sup> The greater constraint might be political: summoning the collective national will to establish the legal, bureaucratic and political infrastructure necessary for a nuclear deterrent posture.

### **Break-out timelines**

Among the 185 non-nuclear-weapons state parties to the NPT, Japan may have the shortest break-out time. Just how fast Japan could dash to build a bomb is a matter of considerable conjecture, much of it unsupported by factual analysis. Hyperbole is casually employed to suggest that Japan is just a 'screwdriver's turn' away from the bomb.<sup>106</sup> When he headed Russia's Foreign Intelligence Service in the early 1990s, Yevgeny Primakov said that Japan could make a nuclear device in five weeks.<sup>107</sup>

In Western circles, it is commonly suggested that Japan could produce a nuclear weapon in as little as six months.<sup>108</sup> American arms control expert Jeffrey Lewis assiduously sought to track down the derivation of the six-month claim and concluded that it is without technical basis. It appears to date from an offhand statement by a 'Japanese strategic thinker' in 1976 as cited in Richard Halloran's 1991 book, *Chrysanthemum and Sword Revisited: Is Japanese Militarism Resurgent?* Lewis quips that 'six months' is shorthand for meaning 'fairly soon', akin to the biblical phrase '40 days and 40 nights' as meaning a long time.<sup>109</sup>

The six-month common wisdom estimate based on a crude bomb contrasts with a Japanese internal study in 2006, which calculated that it would take at least three to five years before Japan could go into trial production of a miniaturised warhead.<sup>110</sup> Most US intelligence estimates have also been more cautious. A 1966 US National Intelligence Estimate concluded it would take approximately two years to produce and test a nuclear device, including the time needed to build a reprocessing plant and metal reduction facility.<sup>111</sup> A more extensive estimate the next year concluded that after the first device it would take three to five more years to develop a warhead compatible with a reengineered satellite launch vehicle.<sup>112</sup> One outlier to the cautious US intelligence community assessments was a 1999 report by the US Defense Intelligence Agency, which breezily concluded that 'Germany and Japan, which have developed their technology base and fissile material production base in support of their civilian nuclear power programs, could develop a nuclear warhead within a year should the political decision be made to pursue such a capability'.<sup>113</sup>

The Japanese and American government timeline estimates suggest a thorough, careful process in accord with Japan's usual way of tackling technological challenges. In a crisis mode, the

timeline for producing reliable nuclear weapons could probably be shortened to one or two years, especially if reliability and accuracy were less important considerations. This is the general assessment of American analysts who have studied the issue with an eye to detail, although there is reasonable doubt over timelines.<sup>114</sup> The need to develop a weapons design from scratch – unless it could be obtained from an ally or via the black market – could itself take a year or more if Japan sought a sophisticated weapon on par with China's.<sup>115</sup> The technically derived timelines are all artificial, however, because they do not account for the legal and political obstacles that would have to be overcome.<sup>116</sup>

If Japan were to seek to produce nuclear weapons, plutonium is usually regarded as the most likely pathway. The possibility of uranium enrichment must also be considered, however. It might even be the preferred path if Japan were to seek nuclear weapons quickly and did not need to miniaturise them. HEU is easier to work with than high-burn-up plutonium and presents no radiation concern and less risk of pre-ignition. If stealth were required, uranium could be obtained from an old unused mine and small dedicated facilities for milling, conversion and enrichment. Japan might also seek to produce HEU via laser isotope separation, a technology with which Japanese nuclear scientists experimented before 2001, when government funding was cut. The equipment and know-how remain.<sup>117</sup>

### **Potential motivations**

If Japan were to go nuclear, it would be the result of a severe deterioration in its security situation in the face of a strong threat and a perception that Japan could no longer count on America's extended deterrence. A breakdown in the global nuclear non-proliferation regime might add to the motivation. Such a nightmare combination is unlikely in the foreseeable

future. And even if one or more of the factors did materialise, nuclearisation is far from inevitable.

In fact, each of these situations has arisen to a certain extent over the past two and a half decades. When the Soviet threat disappeared with the end of the Cold War, many Japanese worried that the US would have less reason to extend a defence commitment. China's nuclear modernisation and growing conventional capabilities threaten Japanese security, as does North Korea's nuclear posture. The emergence in Asia of three new declared nuclear states since 1998 showed an unravelling of the non-proliferation order. And yet Japan has steadfastly remained non-nuclear. It looks set to remain so.

Japan's continued non-nuclear status has belied many a prediction. In the late 1960s, Herman Kahn insisted that Japan would become a nuclear superpower within a decade and a half because it would not be able to sit by as neighbours acquired nuclear weapons. Zbigniew Brzezinski in 1972, John Mearsheimer in 1992, and Kenneth Waltz in 1993<sup>118</sup> were among the realism theorists who predicted that Japanese nuclearisation was a question of when, not if. This was also the view of the US intelligence community in 1957.<sup>119</sup> Many Japanese themselves in the 1960s thought so, too. In a 1969 Yomiuri poll, for example, 77% believed Japan would have nuclear weapons by 2000.<sup>120</sup> Yet it did not happen. Let us examine each of the potential motivations.

## Korea

A 1995 report by what was then Japan's Defense Agency said that North Korean nuclearisation could cause Japan itself to consider going nuclear in the future.<sup>121</sup> Several foreign analysts made similar predictions.<sup>122</sup> Indeed, North Korea presents the most imminent threat.<sup>123</sup> Pyongyang's medium-range *Nodong* missiles presumably can carry nuclear and chemical weapons

and can hit most of Japan.<sup>124</sup> A provocative article in the Democratic People's Republic of Korea (DPRK) state media in 2013 listed Japanese cities within range of the missiles. North Korea's 1998 test of an intermediate-range *Taepodong* missile that overflowed northern Japan was a shock arguably comparable to the impact on America of the Soviet launching of *Sputnik* in 1957.<sup>125</sup> As noted above, the North's October 2006 nuclear test broke a public taboo on discussing a nuclear option for Japan.<sup>126</sup>

Yet what changed was merely the willingness to talk about the issue; only a small number of politicians on the far right actually called for Japan to go nuclear in response to the North Korean provocation. An Asahi public opinion poll after the test found that 82% of the Japanese population still wanted Japan to stick to the non-nuclear principles.<sup>127</sup> Having a nuclear neighbour was not new, given that Japan had peacefully coexisted with Soviet nuclear weapons since 1949 and with Chinese nuclear weapons since 1964. The lack of hysteria probably reflects confidence in the credibility of the US defence shield.<sup>128</sup> In addition, Japan has its own non-nuclear options for defending against nuclear-armed DPRK, including ballistic missile defence platforms and a potential to acquire pre-emptive strike capabilities.<sup>129</sup> For many Japanese, North Korea's failure to resolve the matter of Japanese citizens abducted in the 1970s and 1980s has been a higher priority than the nuclear threat.<sup>130</sup>

Strategic thinkers in Japan nevertheless remain concerned about North Korea's development programmes for intermediate and intercontinental ballistic missiles and, most recently, nuclear-armed submarines. A DPRK ability to strike the US mainland could call into question the credibility of the US deterrence. If North Koreans believed America might not be willing to risk San Francisco for Tokyo, they would feel freer to act aggressively toward Japan. As in the case of South Korea, this concern about decoupling complicates extended deter-

rence, although it should be noted that the US largely put this issue to rest in Europe during the Cold War with the Soviet Union.

Common wisdom in American security circles holds that if either Japan or South Korea went nuclear, the other would follow suit.<sup>131</sup> This is probably the case if Japan were to go first, for reasons cited in Chapter One. Yet the reverse does not hold, given the deeper anti-nuclear sentiment in Japan and the absence of any sense of a security threat emanating from the Republic of Korea (ROK). Japan's response to ROK nuclearisation would depend on whether the US defence commitment remained intact.

Yet Japanese do worry about the potential nuclear threat from a unified Korea. In the words of one former Japanese senior diplomat, a nuclear-armed unified Korea, combining the South's industrial capacity with the North's A-bomb technology, is the most realistic scenario that would spark Japanese nuclearisation.<sup>132</sup> At a recent seminar in Seoul, a Japanese scholar listed three troubling unification scenarios: the worst case for Japan is the emergence of a pro-China nuclear-armed unified Korea; the second worst is a non-aligned nuclear-armed unified Korea; the third worst is that North Korea's nuclear weapons go missing in a collapse and unification scenario.<sup>133</sup> Other scholars say that, even though the ROK government position is not to keep North Korea's nuclear arsenal under unification, the technology and know-how would be retained and perhaps the fissile material, as in the case of South Africa. Japanese also worry that some weapons and/or fissile material might be secretly kept.<sup>134</sup> US officials downplay this possibility, insisting that, in the event of North Korean collapse, the US would see to the thorough dismantlement of North Korea's nuclear weapons infrastructure and removal of its fissile material.<sup>135</sup>

## China

While North Korea presents the most imminent threat, China is seen by Japan's policy community as the source of more serious and long-term danger. As noted above, China's 1964 nuclear test sparked overt discussion in Tokyo of seeking a nuclear equaliser. China's recent nuclear force modernisation has rekindled some of that psychological and strategic shock. China is seen as much more likely than North Korea to force US–Japanese nuclear decoupling.

Japan worries that the reality of mutual vulnerability between China and the US will be treated by Beijing as equivalent to Cold War-style mutual assured destruction that gives it freedom to assert itself at the conventional level. Speaking at a conference in Washington in March 2015, Sugio Takahashi from Japan's National Institute for Defense Studies said: 'If there is a mutual vulnerability at the strategic level between US and China, then conventional balance at the regional level matters, and Japan has a disadvantage because of lack of geographic depth. So Japan is concerned about the US accepting mutual vulnerability. China's nuclear policy aims to separate the nuclear from the conventional domain.'<sup>136</sup> Some Japanese worry that cuts in the US nuclear force could tempt China to seek to build up to nuclear parity,<sup>137</sup> even though the disparity in warheads today is in the order of 30:1 and China's nuclear posture is not based on keeping up with the nuclear superpowers.

Japan's sense of vulnerability vis-à-vis China relates in greater part to Beijing's growing conventional capabilities, economic rise, defence budget increases and assertive behaviour. China's increasing anti-access/area-denial (A2AD) capabilities, including the DF-21 and DF-26 'carrier killer' missiles under development, are seen as undermining US deterrence, even if they do not have the precision and lethality



sometimes attributed to them.<sup>138</sup> There is a concern that China may be able over time to neutralise the naval and air superiority that the US and Japan have enjoyed in the western Pacific. A2AD capabilities that limit America's ability to project power in the region could undermine faith in America's ability to help defend Japan. Some Japanese security thinkers say that if China's conventional capabilities prevail, Japan may have to consider a nuclear dimension of its own.<sup>139</sup>

### **US commitment**

The single-most important variable affecting Japan's continued non-nuclear posture is the credibility of the US extended deterrence. Credibility is a highly subjective criterion, depending on perceptions more than reality. Over the years, US credibility in the eyes of some Japanese variously has been threatened by US loss in Vietnam, force reductions in the region, the Guam Doctrine, withdrawal from the Philippines, inability to prevent China from becoming nuclear-armed and failure to stop North Korea's nuclear programme. Polls in 1969, 1971 and 1996 found that fewer than half of Japanese respondents believed the US would come to Japan's defence if it were exposed to extreme danger.<sup>140</sup> Most recently, the credibility of the nuclear umbrella has come under question due to US defence budget austerity, a reduced emphasis on nuclear deterrence, the failure to stop Russian aggression in Ukraine and Obama's decision not to employ military force against Syria after it ignored his red line on chemical weapons use.

Japanese strategists understand that the Ukraine and Syria cases did not involve US security commitments. More analogous to Japan's situation would be US failure to come to the assistance of a defence partner, such as if China threatened Taiwan. The concerning scenario need not involve conflict. If Washington were to cut Taiwan adrift in deference to greater

US national interests, as some American pundits have argued (see Chapter Three), it would give the Japanese reason to question the durability of the US commitment in their own case. The fact that the US does not have a treaty commitment to defend Taiwan, as distinct from the commitment to Japan, would probably be lost in terms of perceptions. China's ever-growing dominance as a US trade partner<sup>141</sup> already gives rise to nightmares in Japan that the US might someday choose China over Japan.

Some Japanese security specialists also worry about a reduced role of nuclear weapons in the US deterrence commitment. They want an 'unshakeable nuclear umbrella', as Abe put it to Obama in 2013.<sup>142</sup> During the 2008 US presidential elections, the Foreign Ministry sent senior officials to both the Democratic and Republican party campaigns asking that the candidates not offer to cut deployable nuclear arms to below 1,000.<sup>143</sup> Obama's subsequent New START Treaty agreed to cut only to 1,550 by 2018. But his commitment to a nuclear-free world in his 5 April 2009 speech in Prague exacerbated Japan's nuclear policy ambivalence. On the one hand, most Japanese citizens identified with the disarmament vision; yet Obama's emphasis on reducing the salience of nuclear weapons made policymakers nervous about the strength of the nuclear umbrella. In drafting the 2010 Nuclear Posture Review (NPR), US officials took Japan's concerns into account and rejected language that would have said the 'sole purpose' of the US nuclear arsenal is to deter nuclear attack on the US and its allies. Instead, the review maintained the role of nuclear weapons in deterring attacks by non-nuclear means that threaten vital national interests.

In the run-up to the NPR, Washington-based Japanese diplomats were reported to have argued semi-publicly that the US should not retire the nuclear-armed, submarine-launched

*Tomahawk* Land Attack Missile (TLAM-N). Foreign minister Okada sent a letter on 24 December 2009 to the US secretaries of state and defense denying that this was Japanese government policy and emphasising his own views in favour of nuclear disarmament.<sup>144</sup> The controversial Christmas Eve letter was widely criticised by LDP politicians and the security establishment, who claimed it undermined Japan's national security. They asked what would take the place of TLAM-N at the lower rung of deterrence in the deterrence escalation ladder. The US carefully considered these views and before formally retiring the missiles in question, and as a substitute, committed to modernising globally deployable nuclear-equipped bombers.<sup>145</sup> According to Japanese defence policy scholar Michito Tsuruoka, 'There is a strong consensus in Tokyo that it was well informed and adequately consulted regarding the NPR ... As a result of this, Tokyo's concerns regarding the United States' nuclear posture, not least its adverse implications for extended deterrence, have almost disappeared.'<sup>146</sup> Sending nuclear-capable B-52 bombers and B-2 stealth fighter-bombers over the Korean Peninsula in March 2013 was additionally reassuring to Japan, just as it was to South Korea.

The fact that US Navy surface ships and attack submarines have not carried nuclear weapons since president George H.W. Bush's Nuclear Initiative in 1991 made the TLAM-N controversy surreal. Given the taboo against nuclear weapons use and the increasing accuracy and destructive power of conventional weapons, successive US administrations have realised that deterrence via conventional weapons is more realistic and credible than via nuclear weapons.<sup>147</sup> US operational capabilities and the will to use them in defence of Japan are the important criteria. This is why Japan worries about China's growing A2AD capabilities and assertiveness. America's apparent acquiescence to China's demand that the US and the

ROK not conduct a joint naval exercise in the Yellow Sea after the North Korean fatal sinking of the *Cheonan* corvette in March 2010 was a case in point.<sup>148</sup>

Japan is also concerned about China's 'grey-zone' provocations that are 'neither pure peacetime nor contingencies over territorial sovereignty and interest', in the words of one Japanese strategist,<sup>149</sup> such as regularly sending coastguard vessels to transgress Japan's territorial waters around the Senkaku/Diaoyu islands. To make the point that this is a matter for extended deterrence, updated guidelines for bilateral defence cooperation issued in April 2015 emphasise 'seamless, robust, flexible, and effective bilateral responses'.<sup>150</sup> To the Japanese, this means that the US could be involved from day one of a grey-zone situation.<sup>151</sup>

Obama's statement while visiting Japan in May 2014 that Article V of the US–Japan Security Treaty applied to the Senkakus because they are under Japan's administration provided helpful reassurance and went beyond what some observers had expected in light of the US refusal to opine on the final sovereignty on the Senkakus.<sup>152</sup> Some analysts thought Obama backtracked when he said at a follow-on press conference that this commitment did not mean the US would engage militarily every time international law was violated.<sup>153</sup> Abe himself has made clear, however, that Japan has primary responsibility to defend the Senkakus.<sup>154</sup> Obama's Asia-Pacific 'pivot' or 'rebalancing' strategy has also helped to reassure Japan about commitment and staying power. The number of US troops stationed in Japan – 54,500 as of 2015, including naval forces – may decrease by 9,000 under one Okinawa Marine redeployment plan, but the US military presence shows no sign of fading.

In response to China's A2AD challenges, the US Department of Defense developed the concept of 'Air–Sea

battle', now labelled Joint Concept for Access and Maneuver in the Global Commons, which would entail strikes on the Chinese mainland early in a conflict to eliminate China's 'kill chain' of radars, command-and-control centres, and missile sites. Although the concept is controversial because of its escalatory potential, it helps to signal to both allies and potential adversaries that America's extended deterrence will not be undermined.<sup>155</sup>

Another way in which Washington has addressed Japanese deterrence concerns is by institutionalising dialogue on deterrence strategy and operations. Following up on useful consultations prior to US release of the NPR in 2010, the US and Japan that year established an Extended Deterrence Dialogue, similar to one the US also began with South Korea. According to Japanese officials, it has significantly contributed to sustaining confidence in the credibility of the deterrence.<sup>156</sup>

US abandonment of Japan is unthinkable under current circumstances. The US–Japan alliance is as healthy as ever and is seen by the large majority of the Japanese public and policy community as central to Japanese security policy.<sup>157</sup> According to polling, the credibility of the defence commitment is stronger than it was during the Cold War.<sup>158</sup> In 2015, 75% of Japanese said they trust the US.<sup>159</sup>

A strong alliance relationship is consistent with a different kind of nuclear-acquisition scenario for Japan: one followed in conjunction with the US. Most of the Japanese advocates for nuclearisation see it as a complement to US deterrence, not as a unilateral move in opposition to the US.<sup>160</sup> Samuels and Schoff outline three models for how this might work: 1) purchase or lease of US nuclear weapons with cruise missiles, with the US maintaining a right of launch refusal; 2) lease of US *Trident* missiles with co-development of a submarine platform and cooperation on warhead design, similar to the UK

deterrent model; or 3) deployment of US nuclear weapons on Japanese territory under US control with release to Japan in the event of a crisis, similar to the NATO model.<sup>161</sup> The first two models, and arguably the third as well, would put both countries in violation of the NPT, as well as the Missile Technology Control Regime. All three models are only possible in the event of an irreparable breakdown in US–China relations and US willingness also to allow South Korea some degree of nuclear acquisition. However, the fact that several responsible Japanese strategists envision some form of nuclear sharing with the US means that it is not inconceivable.

### **Constraints**

That Japan has remained a non-nuclear-weapons state throughout the post-war period, despite having both the capabilities and the presumptive motivations, points to the strength of the enduring constraints. The reasons Japan did not seek nuclear weapons at any time over the past 50 years remain dispositive today. As every internal study over the years has found, the social, political, economic and strategic factors all continue to weigh heavily against nuclearisation. Citing these reasons, former US State Department Japan expert Kevin Maher said in 2011: ‘We’ve never had any concern about the Japanese government building a nuclear weapon.’<sup>162</sup>

### **Societal opposition**

Seventy years after the Hiroshima and Nagasaki atomic attacks, an aversion to nuclear weapons remains embedded in Japanese culture and society.<sup>163</sup> Right-wing figures, such as former Tokyo governor Shintaro Ishihara, who advocate developing nuclear weapons remain on the fringes of the political spectrum. In spring 2013, after North Korea’s third nuclear test and a string of provocative verbal threats, a public opinion poll by

the conservative Fuji TV found 24% in favour of having nuclear weapons and 73% against.<sup>164</sup>

The disparaging term 'nuclear allergy' was first used by US secretary of state John Foster Dulles in 1954 to describe the anti-nuclear protests fanned that year by the exposure of a Japanese fishing crew on the *Fukuryu Maru* to deadly radiation from a US thermonuclear test on Bikini Atoll, an event that inspired the Godzilla film series.<sup>165</sup> In the years since, the 'allergy' has become part of Japan's DNA. Although the internal taboo against discussing nuclearisation has dissipated this century, the public reaction remains strongly negative against those who advocate nuclear weapons. Nuclear latency and hedging is socially acceptable but calling for exercising this option is not.

Adding to the moral arguments against nuclear weapons is the post-Fukushima mood against nuclear energy. In the words of former leading diplomat Yukio Satoh, 'the disaster made the Japanese public, housewives in particular, opposed to all things nuclear.'<sup>166</sup> He called it an exaggeration for the Atlantic Council to suggest that there is an ongoing debate in Japan about nuclear weapons,<sup>167</sup> which is promoted only by a small minority. The debate, rather, is about whether to continue nuclear energy at all.

Societal opposition to nuclear weapons is particularly strong in the academic and scientific communities, including in the nuclear technology field, which is both pacifist and leak-prone. If a hawkish prime minister were to decide nuclear weapons must be built, former Foreign Ministry official Kaneko believes that scientists and engineers would refuse to go along and that some would become whistleblowers. The openness of Japanese society is the most effective brake on a nuclear-weapons programme, he contends.<sup>168</sup> Hymans calls such pacifist scientists and other opponents of nuclearisation 'veto players',

and notes that Japan has them in even greater numbers after Fukushima.<sup>169</sup> This societal transparency, combined with the highly intrusive IAEA monitoring presence in Japan, would make it nigh on impossible for Japan to pursue a clandestine path to nuclear weapons.

### **Economic and geographic constraints**

The economic disincentives for South Korea to go nuclear apply to Japan as well. Bilateral nuclear cooperation agreements with Australia, Canada, France, the UK and the US all have stringent non-proliferation conditions, requiring return of all imported materials and equipment if the civilian nuclear programme is misused for military purposes. The leverage of this conditionality will be reduced if the post-Fukushima anti-nuclear mood and stricter safety measures keep most of Japan's nuclear power plants from resuming operation anyway. But unless Japan goes entirely nuclear-free, or finds the magic grail of a self-perpetuating closed fuel cycle, the threat of a nuclear supply cut-off is still a significant deterrent.

A decision to violate the NPT would also have an economic cost in terms of lost trade due to sanctions that would be likely to be imposed. Japan's lower dependency on foreign trade (33% of GDP for Japan, compared to 78% for Korea in 2014<sup>170</sup>) again means that this deterrent is less than in the Korean case, but it remains a non-trivial factor. In repudiation of the prior militarist model, Japan's entire post-war development has been based on the 'Yoshida doctrine' (after the first post-war prime minister, Shigeru Yoshida), emphasising the primacy of economic growth and reliance on the US for security. Deviating from this path and incurring both the economic costs of acquiring a nuclear deterrent and the various opportunity costs and indirect costs that this would entail would not happen without a sharp change to the Japanese psyche.



All of the Japanese government-inspired studies about the feasibility of indigenous nuclear weapons fastened upon the constraints imposed by geography. Japan's narrow area and concentrated population make it vulnerable to a first strike were it to enter into a nuclear competition with land-rich adversaries such as China or Russia. It may believe it would thus need a survivable second-strike capability by developing nuclear-armed submarines, as both the UK and Israel, states with similar geographic constraints, have done. In Japan's case, developing survivable submarines would take perhaps ten years. The nation's existing submarines have no missile launch capacity and are run by diesel engines, with attendant problems of noise and limited patrolling times. During the development phase for nuclear-powered and -armed submarines, Japan would be vulnerable to a pre-emptive strike. Other geographic constraints include the lack of an unpopulated space for nuclear testing and of a location for secure storage and deployment of nuclear weapons and delivery systems.<sup>171</sup>

### **Security considerations**

An indigenous nuclear programme would fan an arms race and thus diminish rather than strengthen Japan's security. It would be intensely provocative to China, possibly sparking a further acceleration in its nuclear and conventional military build-up. Russia may also respond accordingly. Pursuing nuclear weapons might also increase the danger of a pre-emptive nuclear strike from North Korea. In addition, Japanese nuclearisation would provoke South Korea to seek its own nuclear arsenal, adding to regional tension and instability. A departure from the NPT of the most stalwart non-proliferation advocate would spell the demise of the treaty and the end of prospects for a nuclear-weapons-free world. A breakdown of the NPT would increase the chances of states in other regions

also seeking nuclear weapons or at least hedging capabilities, almost all of which would be detrimental to Japan's security and trade interests.

On top of exacerbating security challenges from China, Russia and the Korean Peninsula, Japanese pursuit of nuclear weapons could lead to abandonment by the US or worse. Ishiba, the outspoken advocate of nuclear hedging, cautions against actual nuclearisation for this reason: 'if we develop nuclear weapons, that would be tantamount to saying we don't trust the nuclear deterrence of the United States ... we thereby could make enemies out of both the US and China, which is the scariest scenario.'<sup>172</sup>

National security scholar and former US Defense Department senior official Brad Roberts also puts the danger starkly: 'Japan's decision to seek an independent nuclear deterrent would presumably reflect profound lack of confidence in U.S. credibility; it is difficult to see how or why the U.S.–Japan alliance would survive a Japanese decision to acquire nuclear weapons.'<sup>173</sup> Roberts's view reflects the dominant thinking among America-based analysts.<sup>174</sup> Not everyone agrees, of course. Security policy analyst Elbridge Colby argues that circumstances would determine whether the US would give greater weight to non-proliferation over geostrategic considerations vis-à-vis rising China in responding to Japan acquiring nuclear weapons.<sup>175</sup>

An assessment that Japanese proliferation may be acceptable risks becoming a self-fulfilling prophecy. In early 2003, vice president Dick Cheney and Senator John McCain both commented that North Korea's nuclear quest might force Japan to seek a nuclear option of its own. Influential conservative columnist Charles Krauthammer wrote that the US should endorse a Japanese nuclear deterrent if China did not pressure Pyongyang into stopping its nuclear programme.<sup>176</sup>

Three years later, a former speechwriter for president George W. Bush similarly advocated exploiting the 'Japan nuclear card' vis-à-vis China and North Korea.<sup>177</sup> Japanese advocates of nuclearisation took such comments as an endorsement of their view. Japanese nuclear expert Katsuhisa Furukawa assesses that 'Washington's tacit or open approval' would be the most significant factor in fostering a Japanese decision to develop a nuclear capability.<sup>178</sup> Strategists Kurt Campbell and Tsuyoshi Sunohara thus argue that, however tempting it is to play the Japan card, 'American leaders and influential commentators both within and outside the government should never signal to the Japanese, even inadvertently, that they actually favor Japan's acquisition of nuclear weapons.'<sup>179</sup>

### Assessment

Japan did not seek its own nuclear deterrent after China's 1964 nuclear test, nor after North Korea's 2006 test. Each time it had a better security option via US deterrence. It is thus logical to predict that any further deterioration in Japan's security environment would not spark a nuclear pursuit either, unless Japan had serious doubts about alliance credibility. Given the Asia policy focus of successive US administrations and the multiple forums for deterrence consultations, there is no reason for Japan today to harbour any such doubts. Should any doubts arise, Tokyo could be expected again to first employ a hedging strategy to encourage Washington to recommit.

This hedging strategy should be seen for what it is: a means of diplomatic leverage to ensure a continued American presence in East Asia and a way to keep options alive for the future should circumstances dramatically change. Meanwhile, although the option is being maintained by means of both the enrichment and reprocessing programmes, no visible steps have been taken to enhance the option or to shorten the

timeline. One can instead see policy decisions in the opposite direction, including the discontinuation of the M-V solid-fuel rocket programme and the return to the US of weapons-grade fissile material. In the foreseeable future, the only way that nuclear weapons might appear in Japan would be temporarily aboard US ships or aircraft in the event that the government were to amend the Three Non-Nuclear Principles.

## Notes

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- <sup>67</sup> Acton, 'Wagging the Plutonium Dog'.
- <sup>68</sup> Kitamura, 'Japan's Plutonium Program'.
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- <sup>79</sup> 'Japan's Nuclear Fuel Cycle Futures: Evaluating the Nonproliferation Impact of Japan's Nuclear Fuel Cycle Decisions', summary of a workshop co-hosted by the Center for Strategic and International Studies Proliferation Prevention Program and Hitotsubashi University, 20 November 2014, [http://csis.org/files/publication/141120\\_Report\\_Japan\\_Nuclear\\_Fuel\\_Cycle\\_Futures.pdf](http://csis.org/files/publication/141120_Report_Japan_Nuclear_Fuel_Cycle_Futures.pdf).



- <sup>80</sup> The 47.8-tonne figure is the amount of total plutonium. The amount of fissionable plutonium (Pu-239 and Pu-241) is approximately 30 tonnes, 6.3 tonnes of which is stored in Japan. Since 1994, Japan has voluntarily disclosed data about its plutonium stockpile as a confidence-building measure (but not about its HEU stocks). In reports to the IAEA in 2012 and 2013, Japan forgot to include 620kg of plutonium in MOX fuel that was stored unused at an idle power plant in Kyushu. Rectification of the mistake in 2014 generated domestic controversy, and criticism from China.
- <sup>81</sup> Interview, November 2014.
- <sup>82</sup> 'MOX Imports Have Cost at Least ¥99.4bn, Much Higher than Uranium Fuel', Jiji Press, 22 February 2015.
- <sup>83</sup> Douglas Birch, 'The Projected Cost of the Government's Most Expensive Nonproliferation Effort Rises Again', Center for Public Integrity, 23 April 2015, <http://www.publicintegrity.org/2015/04/23/17218/projected-cost-governments-most-expensive-nonproliferation-effort-rises-again>.
- <sup>84</sup> Acton, 'Wagging the Plutonium Dog'.
- <sup>85</sup> Masafumi Takubo and Frank von Hippel, 'Ending Reprocessing in Japan: An Alternative Approach to Managing Japan's Spent Nuclear Fuel and Separated Plutonium', International Panel on Fissile Materials, November 2013, <http://fissilematerials.org/library/rr12.pdf>.
- <sup>86</sup> 'Japan's Nuclear Fuel Cycle Futures'.
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- <sup>88</sup> Fred McGoldrick, 'IAEA Custody of Japanese Plutonium Stocks: Strengthening Confidence and Transparency', *Arms Control Today*, September 2014.
- <sup>89</sup> Interview with Tatsujiro Suzuki, October 2014. Suzuki was vice chairman of the Japan Atomic Energy Commission at the time of the policy debate.
- <sup>90</sup> Ministry of Foreign Affairs of the People's Republic of China, 'Foreign Ministry Spokesperson Hua Chunying's Regular Press Conference on February 17, 2014', [http://www.fmprc.gov.cn/mfa\\_eng/xwfw\\_665399/s2510\\_665401/2535\\_665405/t1129283.shtml](http://www.fmprc.gov.cn/mfa_eng/xwfw_665399/s2510_665401/2535_665405/t1129283.shtml).
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- <sup>93</sup> US Department of Energy, 'Additional Information Concerning Underground Nuclear Weapon Test of Reactor-Grade Plutonium', 1994, <https://www.osti.gov/opennet/forms.jsp?formurl=document/press/pc29.html>. For a discussion of whether the 1962 test was really reactor-grade, see Gregory S. Jones, 'What Was the Pu-240 Content of the Plutonium Used in the U.S. 1962 Nuclear Test of Reactor-Grade Plutonium?', Nonproliferation Policy Education Center, 6 May 2013, <http://www.npolicy.org/article.php?aid=1212&rtid=2>.
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- <sup>102</sup> Dawson, 'In Japan, Provocative Case for Staying Nuclear'.
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