

THINKING ABOUT THE UNTHINKABLE

Tokyo's Nuclear Option

Toshi Yoshihara and James R. Holmes

Will Japan go nuclear? Doubtful—but what if it does? It is possible to envision circumstances that would impel Tokyo and the Japanese populace to cast aside their long-standing dread of nuclear weapons and to construct an arsenal of their own for the sake of national survival. Menacing strategic surroundings or a collapse of the U.S.-Japan Security Treaty are two such circumstances. If some nightmare scenario did come to pass, the common wisdom has it, Japan could build a working bomb in short order. In 1991, Richard Halloran averred that “Japan is N minus six months,” although he saw no evidence that Japan entertained any ambition to tap its latent weapons capability.¹ In 2007, Gary Sick, a well known commentator on Middle East affairs, reported having been privately told that Japan “could do it, sort of, over a long weekend.”² Japan, that is, may now qualify as a “threshold state,” a term “commonly understood to mean possession of the indigenous ability to acquire nuclear weapons within a relatively short time frame, ranging from a few hours to several months.”³

The authors are associate professors of strategy at the U.S. Naval War College. Toshi Yoshihara has served as a visiting professor at the U.S. Air War College, in Montgomery, Alabama. James R. Holmes has been a senior research associate at the University of Georgia Center for International Trade and Security, Athens, Georgia. Their work on sea power in Asia has appeared in such journals as Comparative Strategy and The American Interest, as well as this journal.

Naval War College Review, Summer 2009, Vol. 62, No. 3

Japan inhabits a tough neighborhood, while the U.S. military position in Asia looks increasingly wobbly. Nearby North Korea conducted a nuclear test in 2006 and paid no penalty for defying the “six party” framework. In January 2009, in fact, Pyongyang announced it has assumed an “all-out confrontational posture” toward rival South Korea and has “weaponized” enough plutonium for four or five implosion-type nuclear warheads.⁴ Japanese thinkers have studied the rise of China closely and what it portends for Japan, positioned just off the

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2009		2. REPORT TYPE		3. DATES COVERED 00-00-2009 to 00-00-2009	
4. TITLE AND SUBTITLE Thinking About the Unthinkable: Tokyo's Nuclear Option				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval War College,686 Cushing Road,Newport,RI,02841-1207				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 20	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Asian seaboard. Beijing has mounted an aggressive naval buildup over the past decade, gaining confidence in its capacity to subdue Taiwan militarily if need be while holding U.S. Navy aircraft-carrier task forces at bay. Taiwan adjoins Japan's southern strategic frontier, meaning that Tokyo could not look with equanimity on a cross-strait war or a return of the island to mainland rule. Indeed, Japanese imperialist expansion more than a century ago was designed precisely to secure its southern strategic flank, the back door to its Ryukyu island chain, which stretches to the coast of Taiwan.⁵ Since the Sino-Japanese War of 1895, Taiwan has been in "friendly hands" for over a century. Accordingly, Japanese policy makers do not take lightly a forcible Chinese acquisition of Taiwan.

To complicate matters, as Chinese strategists look to the "day after Taiwan" they are considering how to exert influence on the sea lines of communication connecting Chinese ports with vital resources in the Middle East and Africa. China's turn toward the South China Sea and the Indian Ocean may give Beijing not only more control over its own maritime security but also more control over the maritime communications on which the resource-dependent Japanese economy relies.

Seen in realist terms, then, China's maritime rise threatens to degrade Japan's strategic position in the region. Tokyo may ultimately conclude that self-help represents the only way to shore up its position. Skyrocketing costs of developing and procuring weaponry are driving the force structure of the American military inexorably downward in numbers. Just one example: the Pentagon's estimates of future U.S. Navy fleet size now run as low as 150 ships, a fraction of the nearly six-hundred-ship navy of the 1980s.⁶ Even the 313-ship fleet espoused by the Navy leadership now appears fanciful, with 283 ships currently in active service and little prospect of accelerating shipbuilding rates enough to increase the inventory by thirty vessels.⁷ Allies like Japan monitor such trends closely. A precipitous decline in conventional U.S. military capacity in the theater could have major diplomatic ramifications, undercutting American staying power in the western Pacific, giving rise to Japanese fears of abandonment, and unsettling the entire Asian security architecture. More to the point, Tokyo would likely interpret such a decline as foreshadowing an end to the American nuclear guarantee.

Accordingly, an effort to discern, as through a glass darkly, Tokyo's nuclear options and their likely consequences is not only worthwhile but imperative for analysts and practitioners of Asian affairs. First, we briefly consider the motives that would induce Japan's leadership to make such a radical break with the antinuclear sentiments of the postwar era. Second, we consider the prospect of Japanese "nuclear hedging," an approach under which Tokyo would build up a capacity to develop nuclear weapons, keeping its strategic options open while remaining in formal compliance with its commitments under the Nuclear

Non-Proliferation Treaty, or NPT. Third, we consider the technical feasibility of a swift Japanese nuclear breakout, paying particular attention to assumptions that Tokyo could stage a breakout within a year of deciding to do so.⁸ Fourth, we identify possible force structures and strategies available to Japan should the island nation's leadership indeed decide it is in the national interest to cross the nuclear-weapons threshold. We close by identifying areas for future research, with the aim of generating a literature of immediate use to policy makers in Washington and Tokyo.

WHY GO NUCLEAR?

Debate has swirled around prospective Japanese nuclear aspirations at least since 1958, when Prime Minister Nobusuke Kishi told the Diet that the nation's postwar "peace constitution" did not forbid a strictly defensive nuclear arsenal. Successive governments, however, disclaimed the words of the hawkish Kishi. By 1967, Prime Minister Eisaku Sato was spelling out "Three Non-Nuclear Principles," informing lawmakers that his government would not manufacture, possess, or "allow the introduction of" nuclear arms into Japan. Sato's principles earned him the 1974 Nobel Peace Prize and have remained the gold standard for Japanese nonproliferation policy ever since. However, it is noteworthy that even Sato was acutely aware of Japan's vulnerability in the dangerous Cold War security environment. Following China's nuclear breakout in October 1964, Sato quickly sought reassurances from the United States that Washington would extend its nuclear umbrella to Japan.⁹ In a conversation with Secretary of Defense Robert McNamara during a state visit to the United States, Sato declared, "Should a war break out [between Japan and China], we expect the United States to immediately launch a retaliatory nuclear strike [against China]."¹⁰ Presumably, America's extended deterrence was a critical precondition to Sato's willingness to forgo the nuclear option.

In any event, Japan's "nuclear allergy" persists to the present day. Mataka Kamiya explains Tokyo's self-imposed injunction against bomb making in terms of the general pacifism codified in Japan's peace constitution, lingering memories of the atomic bombings of Hiroshima and Nagasaki, and antimilitary sentiments dating from the interwar years.¹¹ As a result, concludes Kamiya, opposition to nuclear weapons "is deeply embedded in postwar Japanese culture and society. . . . [I]t is still far stronger, even today, than those who warn of impending Japanese nuclear armament realize."¹² The vast majority of observers in Japan and in the West are inclined to agree with Kamiya, if for different reasons. Indeed, very few scholars have lent credence to rationales for a nuclear buildup.¹³

Tetsuya Endo, a former vice chairman of the Atomic Energy Commission of Japan, argues that while Japan possesses the technical capabilities to stage a nuclear breakout, the material costs combined with the prospects of international isolation would deter Tokyo from pursuing such an option.¹⁴ Brad Glosserman cautions that Japan likely would not survive intact as a nation-state following a nuclear exchange—even a limited one—owing to its lack of strategic depth and the extremely high population density throughout the Japanese Archipelago.¹⁵ Llewelyn Hughes identifies a series of domestic institutional constraints, ranging from constitutional to informal, that have anchored Tokyo securely to the U.S. nuclear guarantee.¹⁶ Others believe that Japan is actively pursuing other strategic options, including strengthening its own conventional military capabilities and deepening its alliance ties to the United States, as substitutes for an independent nuclear deterrent.¹⁷ In sum, normative, material, geographic, institutional, and strategic considerations militate against going nuclear.

There is no denying these constraints. Yet the logic of national security—of threat and response—is not so readily dismissed, even under the special circumstances prevailing in postwar Japan. The prevailing skepticism, moreover, has precluded serious discourse on practical and critical steps—including the development of nuclear doctrine, command and control, and force structure—that Tokyo would have to implement should it embark on a breakout. Therefore, it is useful to postulate strategic rationales and chart a road map for Japanese nuclearization.

Scott Sagan outlines three hypotheses to explain why nation-states seek nuclear weapons. First, according to Sagan’s “security” model, governments “build nuclear weapons to increase national security against foreign threats, especially nuclear threats.” George Shultz memorably summed up the security approach: “Proliferation begets proliferation.”¹⁸ Two policies are possible when threats arise, says Sagan. Sounding a Thucydidean note, he maintains that “strong states do what they can . . . adopting the costly, but self-sufficient, policy of developing their own nuclear weapons.” Weak states, by contrast, “do what they must: they can join a balancing alliance with a nuclear power, utilizing a promise of nuclear retaliation by that ally as a means of extended deterrence.”¹⁹ Doubts about the credibility of a nuclear ally’s security guarantee presumably bring pressure on even weak states—or on states that, like Japan, rely on alliances for other reasons—to seek nuclear capability. This is the logic of self-help.

Second, Sagan’s “domestic politics” model “envision[s] nuclear weapons as political tools used to advance parochial domestic and bureaucratic interests.” Three protagonists in nuclear policy making are typically the nuclear energy establishment, the armed forces, and politicians. The former two actors may have bureaucratic interests in going nuclear, as it would give them leverage in

budgetary processes, allowing them to attract resources. “When such actors form coalitions that are strong enough to control the government’s decisionmaking process . . . nuclear weapons programs are likely to thrive.” Conversely, when a coalition opposes nuclear weapons or the various actors find themselves at loggerheads on this question, more ambiguous results are likely.²⁰ A clash among domestic interests seldom yields neat, entirely rational policies.

Finally, under Sagan’s “norms” model, “nuclear weapons decisions are made because weapons acquisition, or restraint in weapons development, provides an important normative symbol of a state’s modernity and identity.” Government decisions are driven “not by leaders’ cold calculations about the national security interests or parochial bureaucratic interests, but rather by deeper norms and shared beliefs about what actions are legitimate and appropriate in international relations.” A nuclear arsenal is a token of modernity, legitimacy, and great-power status. As Sagan points out, an interactive relationship exists between norms and the bureaucratic actors of his second model. As norms mature over time, they tend to be written into bureaucratic procedures and practices, influencing calculations vis-à-vis important matters like whether to seek nuclear capability.²¹ Beliefs and convictions color rational cost-benefit analyses.

In the Japanese case, it appears, one of Sagan’s models is in tension with the other two. Rational security calculations point to a growing threat, an ally in relative decline, and thus a weaker position for Japan in Asia. Those who incline to this way of thinking tend to see a nuclear breakout as potentially unavoidable. But foreign policy, observe Graham Allison and Philip Zelikow, represents “the extension of politics to other realms.”²² They liken foreign policy to a collage, an amalgam of bargains struck, compromises reached, and coalitions formed on a variety of issues—often under pressure.²³ Proponents of Japanese nuclearization will inevitably encounter deep-seated resistance, both from the electorate and from bureaucratic institutions in which antinuclear attitudes are entrenched.

Discord is the product of this societal indecision. Applying Allison and Zelikow’s metaphor in the context of Sagan’s three models, Japanese policy makers will incline strongly to some middle way between pro- and antinuclear factions. If successful, they will maximize their liberty of action, appease important parties with stakes in the outcome, reinforce American support for the security alliance, and avoid setting off a public outcry.

OPTION ONE: NUCLEAR HEDGING

If we have interpreted events correctly, Tokyo will hedge its bets on whether to go nuclear—if indeed it has not already embarked on such an approach.²⁴ Japan’s leadership, that is, will postpone a decision for as long as possible,

monitoring its security surroundings while quietly building up the planning and strategy-making processes, expertise, infrastructure, and materiel that would make possible the fielding of a modest arsenal within a reasonable amount of time. This is not an uncommon approach for governments. Notes Ariel Levite, “Would-be proliferants rarely make formal decisions to acquire the bomb or for that matter to give it up before they absolutely have to (e.g., before they are on the verge of attaining or eliminating a nuclear capability), if then.” Having a “nuclear ‘option’” often makes sense in pure realpolitik terms.²⁵

Evelyn Goh defines hedging in general terms as “taking action to ensure against undesirable outcomes, usually by betting on multiple alternative positions.” This makes sense, says Goh, when the leadership cannot decide on “more straightforward alternatives,” rating the costs of such alternatives as too high or the payoffs too low.²⁶ More to the point, Levite defines “‘nuclear hedging’ as a national strategy lying between nuclear pursuit and nuclear rollback.”²⁷ John F. Kennedy famously predicted that fifteen to twenty nuclear-weapon states would emerge by the end of the 1960s.²⁸ That clearly did not happen. It nevertheless appears that hedging offers the middle way that embattled Japanese makers of policy and strategy will be looking for as they try to satisfy the interests that Scott Sagan identifies.

In this scenario, much of the hedging will take place within the domestic arena. Moving beyond mere calls for debate on the nuclear question, the Japanese policy community would begin a more serious discourse on breaking out. For example, the prime minister could openly and formally revisit and reaffirm the constitutionality of nuclear armament, perhaps by appointing a blue-ribbon commission of some type. Such a move would be as much about shaping public opinion and expectations as about developing concrete plans to be implemented.

A gradual, transparent, and deliberate analytical process thus would aim to move the nuclear issue inside the bounds of routine political discourse for the Japanese state and society. Llewelyn Hughes astutely observes that recent institutional reforms have centralized power in the prime minister’s office, bolstering that body’s ability to set and impose Japan’s national security agenda. This and other reforms, Hughes concludes, have “ensured that the formal barriers to nuclearization are surmountable.”²⁹ It is therefore conceivable that future efforts to strengthen executive authority further would signal the will and expected capability to overturn constraints on pursuing an independent nuclear option.

Persuasive rhetoric toward important audiences will be critical to any hedging strategy. Japanese leaders will need to navigate among the domestic interests examined by Scott Sagan, reassure the watchdog International Atomic Energy Agency (IAEA) and the international community that Japan has no desire to break its NPT commitments, and concurrently apply pressure on the United States not to draw down its conventional military commitment to Japan or,

worse still, fold up the nuclear umbrella under which Japan shelters. Indeed, added pressure on Washington to make its processes for making nuclear strategy and decisions more transparent to Tokyo would implicitly signal that Japan's nonnuclear posture is not absolute.

In other words, if the United States fails to integrate Japan more meaningfully into its nuclear plans, Tokyo might have no choice but to pursue an independent option. Alternatively, Tokyo might modify its Three Non-Nuclear Principles, lifting its self-imposed ban on the introduction of nuclear weapons onto Japanese territory. This would represent a precursor to limited deployments of U.S. nuclear weapons to strengthen deterrence.³⁰ The deployment of Pershing intermediate-range missiles in Europe during the 1980s offers a useful precedent. Such a move might eventually open the way for joint management of nuclear weapons positioned in the home islands, similar to existing U.S.-NATO arrangements.³¹ A strategy of calculated ambiguity that at once played up Japanese capacity to go nuclear and remained noncommittal on Japanese intentions of doing so would offer Tokyo its best diplomatic option should security conditions continue to decay in East Asia.

OPTION TWO: BLACK SWANS AND NUCLEAR BREAKOUT

What would it take to empower adherents of Sagan's security model, allowing their views to win out over domestic interests opposed to nuclear weapons and over norms of decades' standing? A central feature of Japan's security strategy is the nation's utter dependence on the American nuclear umbrella. As Yukio Satoh succinctly explains, "The U.S. extended nuclear deterrence will continue to be Japan's only strategic option to neutralize potential or conceivable nuclear and other strategic threats."³² That is, even barely perceptible signs of weakness in the U.S. nuclear posture (either perceived or real) could trigger alarm and overreactions in Japan.

Japanese concerns over the Obama administration's recent moves to advance nonproliferation and disarmament objectives attest to such sensitivities. Specifically, Japanese policy makers fret that "extended deterrence could weaken if Washington appears too eager to placate China and Russia on these [global disarmament] issues in pursuit of the nonproliferation objective or if it permits a latent North Korean nuclear capability in exchange for safeguards against proliferation."³³ In 2006, North Korea's nuclear test compelled the Japanese government to seek public reassurances from the United States that extended deterrence remained intact.³⁴ Not surprisingly, even skeptics on the matter of Japanese nuclearization concede that an erosion of American credibility could fundamentally reshape the Japanese strategic calculus. The Congressional Research Service forcefully contends that "perhaps the single most important

factor to date in dissuading Tokyo from developing a nuclear arsenal is the U.S. guarantee to protect Japan's security."³⁵ The causes and processes by which U.S. extended deterrence could be undermined in Tokyo's eyes are beyond the scope of this article. Nevertheless, we contend that a gradual or sudden collapse of the nuclear umbrella would be among the most decisive stimuli for a Japanese nuclear breakout.

Indeed, historical precedents in Cold War Asia provide ample evidence of the proliferation-related consequences of real or perceived American indifference to the region. In the past, perceptions of declining American credibility and of weaknesses in the nuclear umbrella have spurred concerted efforts by allies to break out. In 1971, under the Nixon Doctrine, which called on allies to bear heavier burdens, Washington withdrew a combat division from the Korean Peninsula. As a consequence, according to Seung-Young Kim, "Korean leaders were not sure about U.S. willingness to use nuclear weapons," despite the presence of tactical nuclear weapons on Korean soil.³⁶ Such fears compelled President Park Chung Hee to initiate a crash nuclear-weapons program. To compound matters, President Jimmy Carter's abortive attempt to withdraw all U.S. forces and nuclear weapons from the Korean Peninsula accelerated Park's pursuit of an independent deterrent.

Similarly, China's nuclear test in 1964 kindled "fear that Taiwan might be wiped out in a single attack, with U.S. retaliation coming too late to prevent destruction."³⁷ This lack of confidence in American security guarantees impelled Chiang Kai-shek to launch a nuclear-weapons program. The Sino-U.S. rapprochement of the early 1970s further stimulated anxieties among Nationalist leaders about a potential abandonment of Taiwan. In fulfilling its pledges under the Shanghai Communiqué, which began the normalization process, the United States substantially reduced its troop presence on the island. As Nancy Bernkopf Tucker argues, "The withdrawal of American forces from Taiwan compelled the Nationalists to think more seriously about alternative ways of protecting themselves," including nuclear weapons.³⁸ Recently declassified materials document growing American alarm at the prospect of a nuclear breakout on the island throughout the decade.³⁹

In both cases, sustained American pressure, combined with reassurances, persuaded the two East Asian powers to forgo the nuclear option. The Taiwanese and South Korean experiences nonetheless show that states succumb to proliferation temptations as a result of a deteriorating security environment, heightened threat perceptions, and a lessening of confidence in the United States. While Japan certainly faces far different and less worrisome circumstances, these two case studies serve as a reminder to analysts not to casually wave away the possibility of a Japanese nuclear option.

As noted above, analysts and Japanese politicians evince conviction that Japan could erect a nuclear deterrent in a relatively short period of time. We are unpersuaded by this apparent optimism and conventional wisdom. It is true that Japan possesses all the trappings of a nuclear power. Yet the path to a credible nuclear status is likely to be long and winding. Above all, Japan needs the material capacity to develop a bomb.⁴⁰ With fifty-five nuclear-power plants in operation around the country and the nuclear sector's large reserves of reactor-grade plutonium, Japan enjoys a readily available supply of fissile material. According to *Sankei Shimbun*, Japan possesses enough plutonium on its own soil and in reprocessing plants overseas to produce 740 bombs.⁴¹ How usable this reactor-grade material would be for weapons purposes, however, remains a matter of dispute among technical specialists. An internal government report unearthed by *Sankei Shimbun* reportedly concluded that Japan would need several hundred engineers, 200–300 billion yen (or \$2–\$3 billion), and three to five years to fabricate a serviceable nuclear warhead.⁴²

The real question would be timing. It is doubtful in the extreme that Japan could circumvent its safeguards agreement with the IAEA undetected for long.⁴³ While the cases of Iran and North Korea demonstrate that it is possible to bypass the IAEA, Japan holds itself to much higher, more stringent standards, having assented to one of the most intrusive, regular inspection programs in the world.⁴⁴ Furthermore, think of the diplomatic blowback: one can only imagine the uproar if such an effort on the part of Japan, a consistent, sincere opponent of nuclear weapons, were exposed to public and international scrutiny.

Thus, Japanese policy makers must consider the extent to which Tokyo could withstand mounting external pressure to cease and desist while its nuclear complex amassed enough bomb-making material for a viable arsenal. Tokyo cannot expect to deceive the international community long enough to present the world a *fait accompli*. It would probably have to make its intentions clear—and endure international opprobrium—well before reaching the breakout threshold, if not at the outset.

Even assuming that Japan can procure enough fissile materials to build an arsenal, its engineers would still have to leap over several technical barriers. First, Japan must devise an effective, efficient delivery system. The most direct route would be to arm Japan's existing fleet of fighter aircraft with nuclear bombs or missiles. The fighters in the Air Self-Defense Force (SDF) inventory, however, are constrained by four factors: vulnerability to preemptive strikes while still on the ground at their bases; limited range, as Japan possesses no strategic bombers; susceptibility to interception by enemy fighters while en route to their targets; and vulnerability to increasingly sophisticated

integrated air-defense systems. Compounding these shortcomings, Japan is surrounded by water, substantially increasing flight times to targets on the Asian mainland.

In light of this, ballistic or cruise missiles would likely rank as Japan's weapon of choice.⁴⁵ The challenges would be two. First, if Tokyo chose to rely on a missile delivery system, it would have to produce a workable, miniaturized nuclear warhead that could be mounted atop an accurate cruise or ballistic missile. Such a feat is not beyond Japanese engineering prowess, but it would involve significant lead time. Second, the nation must develop the delivery vehicle itself. Even the U.S. defense-industrial sector, with its half-century of experience in this field, takes years to design and build new missiles. Japan could conceivably convert some of its civilian space-launch vehicles into ballistic missiles, but it would have to perfect key components, like inertial guidance systems. If it opted for long-range cruise missiles, Tokyo would in effect find itself—unless it could purchase Tomahawk cruise missiles off the shelf from the United States, a doubtful prospect, given the highly offensive nature of Tomahawks and thus the political sensitivity of such a sale—compelled to start from scratch. Procuring and integrating satellite guidance, terrain-contour matching, and other specialized techniques and hardware would demand long, hard labor from Japanese weapon scientists.

There is also the question of testing. Japan would need to ensure the safety and reliability of its nuclear arsenal. There would be no substitute for an actual nuclear test that proved this new (for Japan) technology while bolstering the credibility of Japanese deterrence. The Japanese Archipelago is simply too small and too densely populated for a test to be conducted there safely—even leaving aside the potential for a political backlash, given the memories of Hiroshima and Nagasaki it would conjure up. Tokyo could detonate a device near some Japanese-held island in the Pacific, such as Okinotori-shima. But again, the diplomatic furor from flouting the Comprehensive Test Ban Treaty (CTBT) would be intense, while the Japanese populace would think back to the *Lucky Dragon* incident during the Bikini tests of the 1950s.⁴⁶ One need only recall the uproar over French and Chinese tests on the eve of the CTBT's entry into force. Computer simulations of weapon performance may be less optimal but would certainly be more palatable from a political standpoint for Japan. The Israeli experience may be instructive here for any Japanese bomb-making efforts.

The technical dilemmas reviewed above demonstrate that there is no shortcut to a nuclear breakout, even for a technological powerhouse of Japan's standing. The Congressional Research Service notes, "If one assumes that Japan would want weapons with high reliability and accuracy, then more time would need to

be devoted to their development unless a weapon or information was supplied by an outside source.”⁴⁷ Kan Ito, a commentator on Japanese strategic affairs for nearly two decades, concurs, considering observers who predict a rapid break-out “utterly presumptuous.” Declares Ito, “It is dangerous to believe such a misconception. It will take 15 years for Japan to build up its own autonomous nuclear deterrence capability that is truly functional.”⁴⁸ While one may quibble with his fifteen-year timeline, which seems unduly pessimistic, the period required to develop and field a credible deterrent would probably be measured in years rather than the weeks or months cavalierly bandied about.

STRATEGY, DOCTRINE, AND FORCE STRUCTURE

Beyond technical and tactical decisions associated with breaking out, Japan would need to develop comprehensive policies and processes to harness its nuclear arsenal. As noted above, strategic ambiguity over Japanese intentions and capabilities is probably impossible. As a nation that has long cherished its democratic institutions and unquestioned civilian control of the military, Tokyo would need to issue formal public statements and official documents regarding Japanese nuclear doctrine. Intended for public and international consumption, such declarations would presumably predate the SDF’s deployment of a deterrent force, helping reassure Japan’s neighbors, friends, and allies, especially the United States.

Japanese officials would probably frame their doctrine strictly in terms of Japan’s unique strategic position and local circumstances. Geostategic realities would dictate that Japan renounce the war-fighting utility of nuclear weapons, hold fast to an unconditional no-first-use policy, and adopt an exclusively retaliatory nuclear posture. Japan is simply too small and vulnerable to contemplate any but the most minimal deterrent options. The goal of Japanese nuclear strategy would be to threaten credibly limited nuclear strikes against one or several countervalue targets, deterring first use by an adversary. Such a punitive approach has long underwritten the doctrines of such smaller nuclear powers as France and China.

None other than former prime minister Yasuhiro Nakasone has expressed confidence that a defensive, minimalist nuclear posture would suffice for Japan. With candor rare among Japanese politicians, he states:

I believe it is constitutional for Japan to possess small-size nuclear weapons as long as we use them only for the purposes of defending our country. A small-size nuclear weapon has a strength that is less than one-third of the power of the atomic bomb dropped on Hiroshima. Even the U.S. Congress allows research on such small-size nuclear weapons. In order to raise Japan’s defense capability in case of emergency, our Constitution should allow Japan to possess small-size nuclear weapons.⁴⁹

While Nakasone does not stipulate the size he prefers for Japan's nuclear arsenal, he clearly believes that the destructive power of low-yield weapons would generate sufficient deterrent effects vis-à-vis would-be enemies. Keishi Saeki of Kyoto University articulates a similar logic for an independent Japanese deterrent:

Possession of retaliatory nuclear arms consists of a means to retaliate against nuclear attacks by other nations. In other words, we must resign ourselves to accepting the initial nuclear attack. And, such conditions should alleviate to a certain degree threats against other Asian nations. Moreover, the option of retaliatory nuclear arms requires preventive preemptory strikes against imminent potential (very highly probable) nuclear attacks from other nations. Accordingly, aside from possession of nuclear arms, probably necessary will be the procurement of precision guided weapons and a missile defense system, and intelligence-gathering activities.⁵⁰

Saeki provides a useful framework for matching means to his proposed retaliatory option. Other Japanese analysts have also offered surprisingly concrete proposals for a credible, defensively oriented deterrent. A former member of the Ground Self-Defense Force, Nisohachi Hyodo, argued as early as 1996 for an undersea deterrent, persuasively and methodically discounting the utility of land- and air-launched delivery systems, as well as of systems deployed in the surface fleet.⁵¹ Fixed silos would be most vulnerable to preemptive strikes, he argues, while Japan is too small to make maximum use of rail- or road-mobile launchers. Aircraft could be destroyed on the airfields in a first strike, while surface combatants could be tracked and sunk with little warning by nuclear attack submarines. As such, Japan's only option is to deploy conventionally powered submarines armed with submarine-launched ballistic missiles, or SLBMs. For Hyodo, two submarines, each carrying only one missile and "roaming in separate sea zones," would be adequate to deter one target country.

In contrast, a former deputy minister under the Koizumi administration, Kenzo Yoneda, is less quick to dismiss the possibility of fitting surface warships with nuclear-tipped cruise missiles. Yoneda postulates that land-attack cruise missiles with a range of a thousand kilometers—akin to the American Tomahawk but with shorter range—deployed on board the Maritime Self-Defense Force's Aegis destroyers would constitute an important component of Japan's nuclear posture.⁵² While Yoneda furnishes no specific estimates of how many missiles it would take to constitute a credible seaborne deterrent, his emphasis on cruise missiles, which carry far smaller payloads than intercontinental ballistic missiles, dovetails with Nakasone's call for "small-size nuclear weapons." The relatively short ranges Yoneda envisions, moreover, imply a modest regional deterrent force for Japan.

Kan Ito argues that Japan must possess two or three hundred nuclear-armed cruise missiles deployed on “small destroyers and submarines” to establish minimum deterrence.⁵³ Ito presumably supports using existing platforms like Aegis destroyers and the latest diesel submarines as launch platforms. He also makes a compelling case against ballistic missiles, contending that they are far more destabilizing than cruise missiles because of sharp differences in speed and destructive potential. Relatively slow, single-warhead, low-yield cruise missiles would signal Japan’s determination to blunt opponents’ preemptive strategies while remaining in an unmistakably retaliatory posture. This approach, Ito concludes, would be more conducive than a ballistic-missile force to a stable Asian military balance.⁵⁴ Clearly, then, even hard-liners and proponents of nuclearization embrace a defensive-minded nuclear doctrine.

The aforementioned options are not mutually exclusive. Japan could very well adopt a mix of delivery systems, or the SDF could phase in more sophisticated weaponry and platforms as they become available. It is therefore worth exploring the risks, rewards, and technical feasibility of some of the proposals reviewed above. First, Japan would be hard pressed to choose SLBMs as the backbone of its deterrent. The Maritime SDF’s existing conventional submarines are too small to carry such missiles. While a fleet ballistic-missile submarine, or SSBN, would represent the ideal platform for a guaranteed second-strike capability, the technological hurdles would severely challenge even Japan’s top-notch scientific and engineering community. To name just one such hurdle, the SDF possesses no naval reactors. Developing and building the propulsion plant for an SSBN would be enormous undertakings in themselves. The financial cost of building, maintaining, and deploying multiple SSBNs—the Maritime SDF would need two to three boats to keep one on patrol at any given time—would tax a defense budget already under strain. Tetsuo Sawada of the Tokyo Institute of Technology estimates that a single SSBN armed with ballistic missiles would cost Japan a breathtaking five billion dollars, while a credible deterrent force involving several submarines would reach an astronomical ten trillion yen, or in excess of \$100 billion.⁵⁵

We therefore judge an undersea ballistic-missile deterrent improbable for Japan unless the security outlook is truly dire, justifying an effort of such magnitude and duration. Cruise missiles, in comparison, are cheap and easy to develop. Indeed, much of the technology is readily available off the shelf in the marketplace. Since Japan would aim retaliatory strikes at large cities, its cruise missiles would not need to be particularly accurate. Major Asian metropolises like Pyongyang, Beijing, and Shanghai are near the coast, making penetrating enemy airspace relatively easy. The target set would fall well within the range of missiles like those espoused by Kenzo Yoneda. In theory, only one bird would need to get through for

Japan's minimum deterrent to be credible. Ito's call for two to three hundred missiles thus may be somewhat excessive, even assuming high attrition rates due to malfunction or enemy interception.

In all probability, Japanese cruise missiles, which are far smaller than medium-range ballistic missiles, would be fired from conventional submarines—presumably from torpedo tubes, given how difficult it would be to retrofit these boats with vertical launchers—to maximize the survivability of the deterrent force. We forecast that Tokyo would need time to perfect techniques and procedures for launching cruise missiles from submerged conventional submarines. In the meantime, once the missiles became available in sufficient quantities, they could be deployed in vertical-launch canisters on board Aegis destroyers as a stopgap measure. Two or three destroyers could cruise simultaneously in disparate locations in the Pacific, enhancing redundancy and survivability. Cruise missiles could also be fired from fighter aircraft at long distances. For instance, missiles launched from an F-2 based in Okinawa would be able to reach most of China's major coastal economic centers. Such redundancy at sea and in the air might meet Japan's strategic requirements temporarily until the undersea option was fully functional.

We acknowledge the drawbacks to deploying cruise missiles aboard conventional submarines. They are slow by comparison to their nuclear-powered brethren, their range is limited by fuel capacity, and they can remain on patrol for only a short period. SDF conventional submarines thus would likely find themselves confined to patrol grounds near Japanese coasts, rendering them vulnerable to detection. Even so, air-independent propulsion will offset the detection problem once installed in Japanese boats, allowing them to remain underwater for longer stretches. The availability, number, and modest cost of these proven vessels far outweigh their technical shortfalls.

Keeping two boats on station at all times would likely meet Japan's deterrent needs. SDF boats would presumably operate from the existing submarine bases at Kure and Yokosuka. This would allow easy access to patrol grounds in the Sea of Japan and along the Asian seaboard south of the Japanese home islands. Kure in particular makes for an ideal base, offering a central location in the Inland Sea, ready egress into both the Pacific and the Sea of Japan, and easily defensible approaches. Coastal metropolises would be within reach of Japanese boats on station, especially once technical improvements increased SDF cruise missiles' range to rival that of the TLAM-N. The Maritime SDF could diversify its portfolio, as it were, operating in different zones to threaten different targets and complicate adversaries' antisubmarine warfare (ASW) problems. Tokyo could surge additional submarines at any given time, moreover, straining the ASW capabilities of prospective adversaries. Up to eight boats could conceivably be sent to sea, according to the back-of-the-envelope calculations provided below. In light

of the Chinese navy's inattention to ASW, this "limited" nuclear capability represents a potent one indeed.

Finally, there is the matter of budgeting and force sizing. With over forty destroyers and nearly twenty submarines, Japan doubtless already boasts one of the largest and most advanced navies in the world. Nevertheless, undersea deterrent patrols would likely demand substantial, though not prohibitive, increases in the size of the submarine fleet. We assume that the Maritime SDF would deploy a separate submarine group dedicated exclusively to nuclear strike, while maintaining adequate numbers for traditional operations, such as sea-lane security and sea denial. Such a decision would remove the nuclear-armed boats from potentially risky frontline duties along the Asian littoral environment, permitting crew members to accumulate hard-earned experience and sharpen the specialized skills needed for deterrent patrols in the Pacific.

How would Tokyo finance a new arm of its submarine force? In order to maintain its qualitative edge in undersea warfare, the Maritime SDF has traditionally decommissioned submarines unusually early, introducing more advanced boats to replace older ones. To support the nuclear mission, accordingly, the maritime service could easily extend the service life of its fleet by at least ten years, allowing for the conversion of existing boats and the introduction of new submarines without undermining Japan's overall undersea prowess. The U.S. Navy's conversion of four *Ohio*-class SSBNs to serve as cruise-missile platforms, or SSGNs, offers a precedent for this sort of effort.

What about numbers? We believe a deterrent force of twelve cruise-missile submarines would let the SDF keep two boats on patrol at all times. How do we arrive at this figure? While Japanese mariners understandably divulge few details about the technical specifications of SDF submarines, we estimate—very conservatively—that their fuel capacity would permit Japanese diesel boats to remain on patrol for one month. (As a crude measuring stick, the endurance for the ubiquitous, German-built Type 209 is advertised at fifty days at the outside.)⁵⁶ If so, approximately six boats would be necessary for the SDF to keep one on station. Consider:

- One boat would be deployed at any given time, with three others undergoing routine upkeep, crew training, and local operations between deterrent cruises. This would permit a four-boat rotation, with each vessel making three patrols annually. This is a leisurely operating tempo by U.S. Navy standards and thus sustainable indefinitely for the SDF.
- Using the U.S. Navy rule of thumb that it takes three units to keep one in full readiness for deployment, we further assume that an additional two boats would be in extended overhaul at any time, subtracted from the

rotation. This leaves us with our six-to-one ratio between boats in the Maritime SDF inventory and those actually at sea. Again, this may overstate matters, as the American thumb rule assumes six-month deployments, with all the wear and tear that extended cruises impose. Japanese units face fewer demands, and so the SDF could well get by with less.

Multiplying by two—again, with one squadron presumably based at Kure and another at Yokosuka—yields a total of twelve boats. Should Japan’s strategic position continue to deteriorate, Japanese strategists may conclude a bigger margin of deterrence—and thus a bigger undersea fleet—is necessary to national defense.⁵⁷ If so, additional six-boat increments could lie in store. But the more modest fleet sketched here, we believe, would provide more than ample retaliatory capacity for “minimal deterrence with Japanese characteristics.”

Such a fleet would be affordable despite the real and nettlesome budgetary constraints Tokyo confronts. Modest increases in the defense budget as a percentage of gross domestic product (GDP) would generate sufficient resources (in absolute terms) to pay for such a buildup. If the Japanese government came to see the security environment as menacing enough to warrant a nuclear breakout, it would likely reprogram funds to support a naval buildup to support nuclear deterrence. Tokyo has long fixed its defense expenditures at about 1 percent of GDP, amounting to over forty billion dollars a year. The Japanese government would certainly have to shatter this self-imposed, somewhat arbitrary ceiling. If Tokyo were to increase the defense budget by 20 percent—that is, to 1.2 percent of GDP—the additional eight billion dollars per annum could furnish the financial foundation for a major modernization and expansion of the submarine fleet. The average cost of a single conventional submarine on the world market (anywhere between \$200 and \$400 million per boat) suggests that Japan possesses the financial clout to meet these new force-structure requirements.

UNTHINKABLE BUT VALUABLE ANALYSIS

In closing, it is worth reemphasizing that this study eschews any assessment of the likelihood of Japan’s going nuclear. Ample work already exists on the pros and cons of nuclearization. As noted in the introduction to this essay, we concur in general that it is highly unlikely that Tokyo will pursue an independent nuclear arsenal for the foreseeable future. The U.S.-Japanese alliance is arguably in the best shape ever, while mainstream Japanese policy makers remain confident in the credibility of American extended deterrence. However, we believe that this largely valid consensus on the improbability of a nuclear breakout has precluded constructive discourse on practical American policy alternatives should Tokyo undertake a radical change of course. While it may be distasteful to contemplate

such a scenario, we are convinced that there is genuine analytical utility in thinking about the unthinkable. Chief among our findings through this mental exercise is that Japan will not “break out” in the literal sense of the term. Rather, it will proliferate in slow motion, if it makes a decision to go nuclear.

This study by no means constitutes an exhaustive exploration of Japan’s nuclear options and their possible consequences. Four main areas of research would be worth pursuing further. First, a comparative analysis of historical models—particularly the British and French experiences during the Cold War—might offer fruitful insights and potential models for Japan to emulate. Findings regarding the extent to which these smaller nuclear arsenals complemented or fit within the broader U.S. nuclear strategy would be particularly useful for Japanese policy makers.

A second and closely related point is that this study has focused exclusively on a potential Japanese nuclearization process. It would be useful to make an effort to foresee the plausible range of impacts such a momentous decision could have on the U.S.-Japanese alliance on the “day after” a breakout. We incline to doubt that the security partnership would collapse overnight, especially if Tokyo initiated open, constructive consultations ahead of time. Even so, the transpacific alliance would never be the same. Would Washington withdraw its nuclear umbrella in a fit of pique? Or would Tokyo and Washington transcend the initial discord, integrating their nuclear strategies and developing a transpacific deterrent, much as the U.S.-British alliance formulated a transatlantic deterrent to Soviet aggression?

Third, a Japanese nuclear breakout would certainly release shock waves across Asian capitals. How would Japan’s retaliatory posture and forces interact with the Chinese nuclear doctrine and North Korea’s nuclear program? Would Tokyo’s entry into the nuclear club spur both horizontal and vertical proliferation?

Fourth, but certainly not least, there are technical questions to resolve. As noted before, the timing of any Japanese effort to breach the nuclear threshold would depend on large part on the availability of weapons-usable fissile material. How easily could Japanese nuclear engineers put the nation’s stockpile of reactor-grade plutonium to use for manufacturing nuclear warheads? It seems reasonable to suppose that Tokyo could convert this material for use in nuclear payloads over time; the main question is when.

These are questions eminently worth pondering. We make no pretense of offering the last word on the subject of Japanese nuclear options. We hope it is a useful first word in a sorely needed discussion of naval strategy and deterrence in Asia.

NOTES

- The views voiced here are not necessarily those of the Naval War College, the U.S. Navy, or the Department of Defense.
1. Richard Halloran, *Chrysanthemum and Sword Revisited: Is Japanese Militarism Resurgent?* (Honolulu: East-West Center, 1991).
 2. *Global Security Newswire*, 7 December 2007, available at www.nti.org/d_newswire/.
 3. Ariel E. Levite, "Never Say Never Again: Nuclear Reversal Revisited," *International Security* 27, no. 3 (Winter 2002/03), p. 66 note 17.
 4. Choe Sang-Hun, "North Korea Says It Has 'Weaponized' Plutonium," *New York Times*, 17 January 2009.
 5. It is noteworthy that the Japanese launched major air strikes against the Philippines from Kao-hsiung in its initial moves to conquer Southeast Asia.
 6. U.S. Joint Forces Command, *A Framework for Discussing U.S. Joint Force Structures during the Next Administration*, presentation, 12 November 2008, slide 4. The 150-ship figure assumes that Congress and the administration adopt the budget figures put forward by Rep. Barney Frank (D-Mass.). Congressman Frank's proposal translates into a 45 percent real cut in defense spending from the fiscal year 2008 total of \$703 billion, which included supplemental allocations.
 7. U.S. Office of the Chief of Naval Operations, *Report to Congress on Annual Long-Range Plan for Construction of Naval Vessels for FY 2009* (Washington, D.C.: Director, Warfare Integration, February 2008), pp. 3–12; "U.S. Navy Active Ship Force Levels, 2007 to 2008," *Naval Vessel Register*, Naval Historical Center, www.history.navy.mil/branches/org9-4.htm.
 8. See, for instance, William Choong, "Will Japan Go Nuclear?" *Straits Times*, 23 October 2006, available at rspas.anu.edu.au/; Mark Erikson, "Japan Could 'Go Nuclear' in Months," *Asia Times*, 14 January 2003, available at www.atimes.com/.
 9. For a sense of Tokyo's surprise and alarm at Beijing's nuclear breakout, see "China's Rapid Rise as Nuke Power Surprised Japan, U.S.," *Kyodo World Service*, 25 February 2005.
 10. "Sato's Nuclear Request," *Asahi Shimbun*, 24 December 2008.
 11. Mataka Kamiya, "Nuclear Japan: Oxymoron or Coming Soon?" *Washington Quarterly* 26, no. 1 (Winter 2003), pp. 65–67.
 12. *Ibid.*
 13. For a sampling of this sparse literature, see Clifton W. Sherrill, "The Need for a Japanese Nuclear Deterrent," *Comparative Strategy* 20 (2001), pp. 259–70.
 14. Tetsuya Endo, *How Realistic Is a Nuclear-Armed Japan?* AJISS-Commentary 8 (Tokyo: Association of Japanese Institutes of Strategic Studies, 20 July 2007).
 15. Brad Glosserman, *Straight Talk about Japan's Nuclear Option*, PacNet 50A (11 October 2006), and *Japan Peers into the Abyss*, PacNet 20 (20 March 2008), both Washington, D.C.: Center for Strategic and International Studies.
 16. Llewelyn Hughes, "Why Japan Will Not Go Nuclear (Yet): International and Domestic Constraints on the Nuclearization of Japan," *International Security* 31, no. 4 (Spring 2007), pp. 67–96.
 17. Hajime Izumi and Katsuhisa Furukawa, "Not Going Nuclear: Japan's Response to North Korea's Nuclear Test," *Arms Control Today* 37, no. 6 (July/August 2007), pp. 51–56; Mike M. Mochizuki, "Japan Tests the Nuclear Taboo," *Nonproliferation Review* 14, no. 2 (July 2007), pp. 303–28.
 18. George Shultz, "Preventing the Proliferation of Nuclear Weapons," *Department of State Bulletin* 84, no. 2093 (December 1984), pp. 17–21.
 19. Scott D. Sagan, "Why Do States Build Nuclear Weapons? Three Models in Search of a Bomb," *International Security* 21, no. 3 (Winter 1996/97), pp. 55, 57.
 20. *Ibid.*, pp. 55, 63–64.
 21. *Ibid.*, pp. 55, 73–76.
 22. Graham Allison and Philip Zelikow, *Essence of Decision: Explaining the Cuban Missile Crisis*, 2nd ed. (New York: Longman, 1999), p. 256.
 23. *Ibid.*, p. 257.

24. Levite, "Never Say Never Again," pp. 71–73.
See also Yuri Kase, "The Costs and Benefits of Japan's Nuclearization: An Insight into the 1968/70 Internal Report," *Nonproliferation Review* 8, no. 2 (Summer 2001), pp. 55–68.
25. Levite, "Never Say Never Again," p. 67.
26. Evelyn Goh, *Meeting the China Challenge: The U.S. in Southeast Asian Regional Security Strategies* (Washington, D.C.: East-West Center, 2005), pp. 2–4. See also Evelyn Goh, "A Strategic Insurance Policy," *Asia Times*, 6 September 2006, available at www.atimes.com/; and Evan S. Medeiros, "Strategic Hedging and the Future of Asia-Pacific Stability," *Washington Quarterly* 29, no. 1 (Winter 2005–06), pp. 145–67.
27. Levite, "Never Say Never Again," p. 59.
28. Joseph Cirincione, Jon B. Wolfsthal, and Miriam Rajkumar, *Deadly Arsenals*, 2nd ed., rev. (Washington, D.C.: Carnegie Endowment for International Peace, 2005), p. 18.
29. Hughes, "Why Japan Will Not Go Nuclear (Yet)," p. 91.
30. Hisahiko Okazaki, "Time to Consider a Nuclear Strategy for Japan," *Daily Yomiuri*, 7 April 2007.
31. Terumasa Nakanishi, a professor at Kyoto University, argues explicitly that "U.S. nuclear weapons will be deployed in Japan as arms exclusively for the defense of Japan, and Tokyo and Washington will share the buttons to fire them. Japan and the United States should have a joint system to operate nuclear weapons." See "North Korea's Nuclear Threat/Should Revision of the 3 Nonnuclear Principles Be Discussed?" *Daily Yomiuri*, 22 March 2007.
32. Yukio Satoh, *Reinforcing American Extended Deterrence for Japan: An Essential Step for Nuclear Disarmament*, AJISS-Commentary 57 (Tokyo: Association of Japanese Institutes of Strategic Studies, February 2009).
33. James L. Schoff, *Does the Nonproliferation Tail Wag the Deterrence Dog?* PacNet 9 (Washington, D.C.: Center for Strategic and International Studies, 5 February 2009).
34. See Joint Statement of the U.S.-Japan Security Consultative Committee, *Alliance Transformation: Advancing United States-Japan Security and Defense Cooperation*, 1 May 2007, available at www.mofa.go.jp/. The report declared that "the full range of US military capabilities—both nuclear and non-nuclear strike forces and defensive capabilities—form[s] the core of extended deterrence and support[s] US commitments to the defense of Japan."
35. Emma Chanlett-Avery and Mary Beth Nikitin, *Japan's Nuclear Future: Policy Debate Prospects, and U.S. Interests*, Congressional Research Service Report to Congress (Washington, D.C.: Library of Congress, 9 May 2008), p. 10.
36. Seung-Young Kim, "Security, Nationalism and the Pursuit of Nuclear Weapons and Missiles: The South Korean Case, 1970–82," *Diplomacy and Statecraft* 12, no. 4 (December 2001), p. 56.
37. David Albright and Corey Gay, "Taiwan: Nuclear Nightmare Averted," *Bulletin of Atomic Scientists* 54, no. 1 (January/February 1998), p. 55.
38. Nancy Bernkopf Tucker, *Taiwan, Hong Kong, and the United States, 1945–1992: Uncertain Friendships* (New York: Twayne, 1994), p. 146.
39. William Burr, ed., *New Archival Evidence on Taiwanese "Nuclear Intentions," 1966–1976*, National Security Archive Electronic Briefing Book 19, 13 October 1999, *National Security Archive*, www.gwu.edu/~nsarchiv/NSAEBB/.
40. For a sampling of Japan's options for developing a nuclear warhead, see Noritsugu Takebe, "A Domestic Warhead Development Plan," *Gunji Kenkyu*, 1 August 2005, pp. 28–43.
41. "Japan's Nuclear Capability: Model of Peaceful Use; Owns Plutonium Enough for 740 Atomic Bombs," *Sankei Shimbun*, 8 November 2006.
42. "Japan Needs 3–5 Years to Build Nuclear Warheads," Kyodo World Service, 25 December 2006; "Unaware of Reported Government Documents on Nuke Warhead: Shiozaki," *Jiji Press*, 25 December 2006.
43. "Japan Profile," *Nuclear Threat Initiative*, October 2008, www.nti.org/.
44. Shinichi Ogawa and Michael Schiffer, "Japan's Plutonium Reprocessing Dilemma," *Arms Control Today* 35, no. 8 (October 2005), pp. 20–24.

45. If the threat environment deteriorates so precipitously as to warrant an immediate breakout, it is possible to imagine the SDF relying on air delivery as an interim measure.
46. On 1 March 1954 the Japanese tuna boat *Daigo Fukuryu Maru* (*Lucky Dragon 5*) was exposed to radiation from the U.S. CASTLE BRAVO test on Bikini Atoll. A crewman died of the effects the following September.
47. Chanlett-Avery and Nikitin, *Japan's Nuclear Future*, p. 6.
48. Kan Ito, "China's Nuclear Power Will Control the World by 2020," *Shokun*, 1 January 2006, pp. 34–45.
49. Yasuhiro Nakasone, "Japan's National Defense Strategy for the 21st Century," *Voice*, 1 April 2004, pp. 50–57.
50. Keishi Saeki, "Qualifications and Limitations of Nuclear Arms in Japan," *Chuo Koron*, 1 September 2003, pp. 36–39.
51. Nisohachi Hyodo, "A Plan to Deploy Nuclear Warheads in Japan," *Shokun*, 2 October 1996.
52. The TLAM-N, the nuclear variant of the Tomahawk, boasted a range of 2,500 kilometers until withdrawn from service in 1991.
53. Kan Ito, "Are We Prepared to Deal with Kim-Chong-Il's Evil Bombs?" *Shokun*, 1 April 2003, pp. 86–94.
54. Ito, "China's Nuclear Power Will Control the World by 2020."
55. "North Korea's Nuclear Threat / Japan Could Build N-Weapons, But . . .," *Yomiuri Daily*, 21 March 2007.
56. "Type 209," GlobalSecurity.org, www.globalsecurity.org/.
57. Professor William Murray, a retired submariner, estimates that Japan would need some twenty-four missile-armed boats to provide an adequate margin of deterrence. Using our six-to-one ratio, that would allow the SDF to keep four submarines on deterrent patrol at any time. Phone discussion between James Holmes and William Murray, Newport, Rhode Island, 23 February 2009.