

CHAPTER 3

Japanese Strategic Weapons Futures: Three Alternative Futures

Ian Easton

Introduction

The balance of power in Northeast Asia is shifting in ways that are dangerous to the security of Japan. That is certainly how the picture has appeared to the eyes of many observers in recent years.¹ The reasons are many, and they are compelling. First, China's emergence as a regional military power has taken place in a far more disruptive fashion than was expected. Attempts to shape China into a responsible stakeholder have failed, and Beijing now threatens Tokyo with a growing number of coercive air and maritime operations around the Japan-administered Senkaku (Diaoyu) Islands. Chinese fighters, bombers, ships, and submarines have greatly expanded the scope of their training operations. They now frequently pass through Japan's Ryukyu Island Chain on their way out into the Philippine Sea where they conduct exercises that undermine confidence in the ability of the U.S. Navy to intervene in a regional conflict.²

1. Chief of Naval Operations Public Affairs, "Japanese Prime Minister and CNO Discuss Maritime Cooperation," *U.S. Navy*, May 27, 2014, available from www.navy.mil/submit/display.asp?story_id=81247 and Minister of Defense Itsunori Onodera, *On the Publication of the Defense of Japan 2013*, Tokyo: Ministry of Defense, 2013, available from www.mod.go.jp/e/publ/w_paper/pdf/2013/01_Foreword.pdf.

2. *2014 Report to Congress of the U.S.-China Economic and Security Review*

At the same time, China's strategic rocket force, the Second Artillery, has deployed new ground-launched missile systems capable of holding air force and naval bases in Japan at risk. One missile variant, the anti-ship ballistic missile, even appears capable of striking American aircraft carriers and command ships at sea from the sanctuary of China's mountainous interior. In addition, the Strategic Rocket Force is expanding its nuclear weapons stockpiles and deploying new intercontinental and submarine-launched ballistic missiles at a time when the United States and other nuclear powers are reducing their strategic capabilities in compliance with arms control agreements.

Making matters worse, the 2014 Ebola epidemic in Africa and intermittent but serious fighting in Ukraine, Syria, Afghanistan, Iraq, Central Africa, Gaza, Yemen and elsewhere have drawn the attention of American policymakers away from Japan. When the American foreign policy elite does focus on the Asia-Pacific region, it tends to fixate on mounting tensions in the South China Sea, instability in Thailand, and potential reforms in Burma. Too often Japan's critical importance to the United States' interests is overlooked, and the alliance becomes just one more issue for busy American leaders to manage. There is precious little time for long-term strategic thinking in Washington in the midst of perpetual crisis.

North Korea is a shared concern for both Washington and Tokyo.³ Its young leader, Kim Jung-un, has demonstrated an even greater penchant for nuclear blackmail than his deceased father, and Pyongyang may soon press forward with more nuclear tests. However, in spite of the mounting tension, South Korea has been

Commission, Washington, D.C.: USCC, November 2014, pp. 318-322, available from http://www.uscc.gov/sites/default/files/annual_reports/Complete%20Report.PDF.

3. Dennis Blair, "The Ally America Needs," *Politico Magazine*, July 3, 2014, available from www.politico.com/magazine/story/2014/07/the-ally-america-needs-108560.html#.U8lbcvldVIc.

gripped by a wave of anti-Japanese sentiment, and Seoul often refuses to work with Tokyo to advance their shared bilateral security interests. The troubled relationship between South Korea and Japan has even spilled over to the United States, making their bilateral disputes disruptive to America's relations with its two key Asian treaty allies.⁴ Ironically, Japan and South Korea do share one thing: A strict adherence to their respective "One-China" policies. This not only stifles their ability to cooperate with Taiwan, which has a capable military and shared security interests, it further erodes their ability to work in concert with the United States to balance against an increasingly well-armed and aggressive China.

Perhaps the most worrisome aspect of the Asian security situation is being generated from outside the region itself. A series of dysfunctional congressional actions in Washington have drastically cut the U.S. defense budget and left America's top military leadership powerless to properly allocate funds for the rebalance to Asia.⁵ This has affected Japanese confidence in American security commitments. Confidence has also been weakened by the ongoing reductions in the United States' nuclear force posture, and this situation has been further exacerbated by a series of embarrassing scandals within several components of the U.S. Strategic Command.⁶ At a time when North Korea is defiantly engaging in nuclear testing and China is rapidly building up both its nuclear and conventional warfighting capabilities, the United States is evincing signs of national security overload and strategic paralysis. What seemed impossible just a few

4. Samuel J. Mun, *'Destined to Cooperate': Japan-ROK Naval Cooperation and its Implications for U.S. Strategic Interests in Northeast Asia*, Futuregram 14-001, Arlington, VA: Project 2049 Institute, March 4, 2014, available from www.project2049.net/documents/Japan_ROK_naval_cooperation_Sam_Mun.pdf.

5. John T. Bennett, "Carter: Budget Cuts Threaten US Interests," *Defense News*, March 3, 2015, available from www.defensenews.com/story/defense/policy-budget/congress/2015/03/03/isis-ukraine-pentagon-budget/24330491/.

6. Holly Yan and Faith Karimi, "U.S. nuclear weapons: Military nuke officers beset by recent scandals," *CNN News*, January 16, 2014, available from www.cnn.com/2014/01/16/us/military-nuclear-scandals-timeline/.

years ago appears to be coming to pass: American primacy in the Western Pacific is fading. Japan finds itself at a strategic inflection point.

This chapter will present the reader with three future scenarios that illustrate alternative pathways Japan could take to improve its long-term national security outlook and enhance its defense capabilities. These scenarios are neither exhaustive nor predictive. There are always many possible courses of action a powerful state like Japan has available to it, and many more courses that are plausible. For the sake of simplicity, we will explore only three scenarios and leave judgments regarding how probable or plausible they are to the reader. The first scenario will posit that Japan might decide to acquire a small number of nuclear weapons in the relatively near future. The second scenario will posit that Japan might pursue a large-scale nuclear weapons program. The third scenario will posit that Japan might invest more into advanced conventional capabilities and remain a nonnuclear weapons state.

All three of these scenarios rest upon several basic assumptions that are important to identify. The first and most important assumption for these scenarios is that Japan's ally, the United States, will be constrained in its ability to rebalance toward Asia, and, as a result, America's military predominance in the Pacific will decline. The second assumption is that the People's Republic of China (PRC) and the Democratic People's Republic of Korea (DPRK) will continue to pose growing threats to Japan's security. The third assumption is that Japan will fail to work successfully with the Republic of Korea (ROK or South Korea) and the Republic of China (ROC or Taiwan) to meet shared security interests. The fourth assumption is that Japan would prefer to have a strong relationship with its American ally even if the alliance becomes strained by crisis. The final assumption is that Japan will not concede to the demands of China or North Korea when important issues are at stake.

This chapter will attempt to briefly evaluate the respective implications of the three scenarios for Japan's long-term defense. It will

ask the following questions: (1) What would Japan's overall strategy be in each scenario? (2) What doctrine and operational targets might Japan select to realize its strategy? (3) What new weapons would Japan need to neutralize the targets it selected? (4) How much might those weapons cost? (5) What would the American and regional reactions be to Japan's new weapons programs, and what action-reaction dynamics could follow?



Figure 1: Map of Japan and Northeast Asia.

Three Scenarios

The three scenarios discussed in the following section all assume that Japan will, at least to some degree, increase its defense spending and change the nature of its defense posture over the coming years. This is not a sure thing. Japan's defense budget and posture have remained more or less static for decades. Long-standing policies, even bad ones, carry with them the weight of institutional inertia, so it is possible that Japan could attempt to maintain its current "status quo" pacifist strategy and keep defense spending to a mere one percent of its GDP. However, if it does, Japan's security situation will almost certainly continue to worsen, perhaps fatally. It, therefore, seems improbable that Tokyo would choose this option, so it will not be discussed in detail.

This chapter assumes Japan is changing and will continue to change. The notion that everything will stay more or less the same tomorrow as it is today runs counter to the five assumptions that drive this study. Put another way, a long-term status quo Japanese defense policy is incongruent with the trends and provides little comparative value. This chapter is interested in exploring new strategic approaches. While not often discussed in the existing literature, Japan might actually decide to develop nuclear weapons. This could happen if Japan becomes disappointed by the United States and concludes that it needs to take serious steps to deter China and North Korea—and force American attention to its legitimate security concerns. Or Japan, for a variety of reasons, could feel compelled to field a large, independent nuclear force that might number in the hundreds of warheads at first, but then eventually reach well into the thousands. Finally, Japan might decide that its nuclear option remains too risky and unpopular, and instead Tokyo might pursue an improved nonnuclear strategy. These are our three scenarios.

Scenario One: Small Nuclear Force

As Graham Allison and Philip Zelikow point out in their classic book *The Essence of Decision*, states make history altering decisions for reasons that are often difficult to assess in the after light, even for the principal decision makers who were there.⁷ As such, it may be useful to avoid an exhaustive discussion of why Japan might develop and field nuclear weapons. Indeed, there are many ways in which Japan might decide to acquire nuclear weapons. Some are explored in the appendices. For the purpose of this section, however, we will simply assume that Japan does decide to go nuclear in the relatively near future. Having made the leap, we can then consider what that might entail and what might follow.

Strategy. The Japanese government is as cautious, rational, and logical as any in the world. As such, if it did go nuclear, Japan's policy could be expected to be established on top of a well-laid, strategic foundation. One possible and perhaps attractive strategy for Japan might be to build a small nuclear force to serve as a minimal deterrent and, if deterrence failed, a modest second-strike capability. Japan's political objective might be to integrate its nuclear weapons into the U.S. nuclear umbrella as soon as conditions allowed. That way Japan could both improve its ability to deter China and North Korea, and increase its strategic value and importance to its ally, the United States. Naturally, Japanese military strategists might not consider the nationalistic utility of nuclear weapons, but national pride would also be a factor in such an important political decision. Strong politicians in a democracy like Japan's make decisions with the popular will of voters in mind. They could hardly be successful otherwise.

Doctrine and Targeting. Once the overall strategic objective had been established, Japanese military planners would want to begin thinking about how they could realize the nuclear ambitions of their political leaders. It would be logical for the military to be desirous

7. Graham Allison and Philip Zelikow, *The Essence of Decision: Explaining the Cuban Missile Crisis*, New York: Longman Publishing, 1999.

of keeping weapons requirements within the limits of their political guidance. If the strategy was to field the smallest nuclear force possible, and in such a way as to elicit the minimal international (or at least American) concern possible, target selection would be important. One option might be to target specific locations in central Beijing and Shanghai, the respective political and economic hearts of China, and Pyongyang, the capital of North Korea. Small-yield warheads, it might be thought, could be delivered with precision to increase strategic and operational effects. One of the attractions of this scheme would be to initially avoid unnecessary civilian deaths, while holding out the chance for city centers to be completely destroyed. These would not be large city-busting nuclear weapons. Such a targeting policy might be judged to maximize potential strategic effects, while minimizing potential pitfalls in alliance relations and the chance for radioactive fallout to devastate Japan.

China would be the most challenging operational target for Japanese military planners, so it is here they would likely focus their cardinal energies. After a period of detailed study, Japanese planners might notionally select eight important targets around Beijing and six in greater Shanghai. Target categories might include leadership compounds, national command and control facilities, key military headquarters and government ministries, airports and seaports, and symbolic cultural sites. Each possible target would be measured for its strategic importance and attendant level of strike priority during a war. Strategic games and studies would be conducted to test various options and ideas. Great importance would be placed on research into how nuclear weapons might affect the decision making of the Chinese Communist Party's top leadership in a way favorable to Japan. In the context of contemporary Chinese politics, Japan would be mistaken only to focus on operational or tactical level details. With so few nuclear weapons notionally available, each target would have to count for a lot in order for the strategy to work, at least until such a time as Japan could form joint targeting plans with the United States.

Weapons. Once Japanese leaders, both civilian and military, had an idea of what they wanted their nuclear weapons to do, they could then provide basic requirements to the designers and manufacturers tasked with producing the weapons. The questions those building Japan's nuclear weapons might ask would be: How many do you want, and how big do you want them? The answers to those questions would vary depending on the level of optimism or pessimism felt by Japan's Joint Staff. Their operational plans would likely be highly conservative, as is generally the case. Japanese staff planners would probably assume that the enemy's capabilities would all work, perhaps even to the point of making giants out of those enemy systems whose performance is suspect. Japanese war plans might also intentionally underestimate what Japanese forces could achieve, even when fighting alongside their American allies.

With highly conservative planning assumptions, Japan might decide it would require up to six low-yield (5-20 kiloton) nuclear weapons *per target* to have a sufficiently high probability of hitting and neutralizing each. This may seem like a lot of bombs per target, until one considers the details. First, Japan would have to plan on suffering a surprise first strike against its nuclear force. Some weapons would be knocked out. Next, Japan would have to assume it would suffer some force attrition related to technical problems. In addition, some of Japan's nuclear weapons might not be available when they were needed because they were undergoing periodic repairs or maintenance-related upgrades. Not every bomb in a nuclear weapons arsenal is ready for war all the time. Finally, Japan would have to plan on losing some of its weapons before they could reach their targets. Not all could be expected to make it through China's thick screen of air and missile defenses, especially around Beijing and Shanghai, China's most vital cities. The planning situation would be vastly better with North Korea, but again, a China scenario would have to drive Japanese operational planning because it is the most challenging. Responsible defense establishments must always assume for the worst and think tragically to avoid tragedy.

If the Japanese Joint Staff's study results led them to feel more opti-

mistic, or if Japan's political or financial situation allowed for only a very few nuclear weapons, a less conservative planning assumption could be used. Here a critical question would be what delivery vehicle or vehicles Japan plans on using. Obviously, the more survivable and reliable the means of delivery, the fewer nuclear weapons would be required by operational planners. Japan today does not have long-range cruise missiles or ballistic missiles. But even if it did, it seems very unlikely that its first generation nuclear warheads would be miniaturized to the extent required for ease of missile-borne delivery. As is the case for nearly all young nuclear states, Japan would look to aircraft to deliver its nuclear bombs until something better became available. Such an approach would save Japan time and money.

The only aircraft Japan has in its current inventory for striking surface targets is its indigenous F-2 fighter, which is a modified variant of the American F-16. These fighters could hardly be expected to defeat China's air defenses around Beijing and Shanghai, except if used in close coordination with large fleets of Japanese F-15s and decoy drones. Even then, the losses would likely be staggering, though that may not matter much in a nuclear war scenario where the life of Japan was hanging in the balance. Improving the situation considerably, Japan will stand up one or two squadrons of new F-35 joint strike fighters by 2020 (assuming that the aircraft is not further delayed in its production). Japan is also developing its own indigenous F-3 stealth fighter. Stealthy strike fighters would be a far better choice than F-2s for the nuclear delivery mission.

In any event, Japan's Joint Staff planners might, under political pressure, posit that two nuclear bombs would be sufficient to hold a single Chinese strategic target at risk. Japanese planners could therefore notionally require somewhere between 28 and 84 nuclear weapons if they assume for only 14 notional targets. Japan could deliver these weapons with anywhere between two to six squadrons (roughly 40 to 120 airframes) of strike or multirole fighter aircraft (F-2s, or future F-35s or F-3s). Given the unfavorably high probability of force attrition, each Japanese fighter would likely

carry one nuclear bomb so that no more than one strategic weapon would be lost with each fighter shot down.

Budget. The next question is how much a Japanese nuclear weapons program, as described above, would cost the taxpayers of Japan. Here nothing but speculation is available. It is impossible to accurately assess the cost of a notional Japanese nuclear weapons program because so little unclassified data exists that could be used to make a useful comparison. It must also be recognized that weapon costs vary greatly between countries. For illustrative purposes, however, Table 1 provides a notional estimate of what a small nuclear force *might* cost Japan. Note that these estimates do not include the cost of future conventional capabilities Japan would also need to acquire in support of its nuclear force. Note also that budget numbers tend to be highly misleading in even relatively transparent weapons programs. It should be understood by the reader that these estimates, like all defense budget estimates, may be of little value other than to give a false sense of certainty. Yet there is no question that Japan, which is the second most prosperous country in the world after the United States, could very easily afford a modest nuclear weapons arsenal if it wanted one.⁸ That much, at least, should be clear.

8. Japan's defense budget for the year 2013 was estimated to around 60 billion U.S. dollars. The budget available to Japan's military could increase significantly in the years ahead as Japan begins to export defense goods and services abroad, and reexamines its long-standing policy of restricting defense spending to one percent of GDP. Even if GDP growth over the next five years is slower than expected, and Japan does not lift its defense spending restrictions, it will still have one of the world's largest defense budgets. See, Deloitte, "Global Defense Outlook 2014: Adapt, collaborate, and invest," p.16, available from www2.deloitte.com/content/dam/Deloitte/global/Documents/Public-Sector/gx-ps-global-defense-outlook-2014.pdf. See also *The Military Balance 2013*, London: International Institute for Strategic Studies, March 2013, p. 306.

TABLE 1. Notional Costs of Capabilities Required in Japanese Nuclear Force, Scenario One

<i>Weapon (Unit Cost, USD)*</i>	<i>Number (Subtotal)</i>	<i>Cost Estimate**</i>
Low-Yield Nuclear Bomb (\$20 million)	28-84 (\$560 million to \$1.68 billion)	<p style="text-align: center;">High Force Number</p> <p>\$8.34 billion—plus \$350 million in reoccurring costs for personnel, and some additional training and maintenance costs</p> <p style="text-align: center;">Low Force Number</p> <p>\$3.68 billion—plus \$350 million in reoccurring costs for personnel, and some additional training and maintenance costs</p>
Nuclear Storage and Assembly Bunker Site (\$200 million)	2-4 (\$400-800 million)	
Nuclear Engineers and Related Personnel (\$350k per person a year)	1,000 (\$350 million per year)	
Related Modifications and Training for One Fighter Squadron (\$500 million)	2-6 (\$1-3 billion)	
SATCOM for Survivable Command and Control (\$500 million)	1-2 (\$500 million to 1 billion)	
Survivable National Fiber Optic Command and Control System (\$550 million)	1 (\$550 million)	
Hardened Aircraft Shelter (\$8 million)	40-120 (\$320-960 million)	

*All notional costs are highly speculative estimates. For illustrative purposes only. In 2014 U.S. Dollars. **Note that all total costs listed (except for personnel and maintenance costs, which are annual) would likely be spread out over a 5 to 10 year timeframe.

Implications. Japan's top political leaders, strategists, and diplomats would have to assess the impact that its new nuclear bombs would have on its neighbors' perceptions and actions. Japan would weigh the response of the United States and the international community heavily. It would be reasonable to expect that Japan's goal would be to control information regarding its nuclear weapons program so that information release could be calibrated to maximize deterrence and minimize political blowback. The level of secrecy Japan decided to maintain would depend upon these factors as well as on perceptions of likely domestic opinion and reaction. Japan is one of the most transparent and legalistic countries in the world, so expectations of total secrecy could be ruled out. Moreover, it is difficult to see how Japan could effectively achieve its strategic aims of deterring Chinese and North Korean attacks (and attracting American support) if Tokyo did not make its nuclear program public to the greatest extent military and security considerations allowed; although a high degree of ambiguity might be desirable for political reasons.

Japan might assume that its discussions and early work towards its nuclear options could be ambiguous. When and if Tokyo did decide to make a bomb, it would be very difficult to keep secret. Japan would probably have to assume its program would leak, so Tokyo would want to have a force it could field quickly. Once Japan's nuclear weapons program was widely known (if indeed it was not able to have a policy of strategic ambiguity like Israel), tension would certainly follow. Most important would be the American reaction, which would likely be mixed.

Japan would want to have its top diplomats ready to make four promises to Washington: 1) To promise a no first-use policy; 2) to promise it would integrate its weapons into the American nuclear umbrella if allowed; 3) to promise to keep its nuclear weapons capabilities small; and 4) to promise it would not proliferate to other countries.

Regardless of these or any other commitments Japan could make, a period of bilateral tension driven by the arms control community in the United States and elsewhere could be expected. On the other hand, many American leaders would sympathize with democratic Japan and readily “forgive” its actions. Here the evolution of the U.S. policies toward India and Pakistan (countries which, unlike Japan, are not even close treaty allies) would be instructive. Japan might have confidence that it would be able to successfully integrate its small nuclear force into the U.S. extended deterrent structure sooner or later. The principal question might be how long that could take. The answer would only be found in an accurate assessment of the then-U.S. president’s worldview and relationship with Japan’s prime minister. As in any alliance, trust matters a great deal, especially in moments of crisis.

Proliferation would be a serious concern regardless of how the United States responded to the notion of a nuclear-armed Japanese ally. It can be confidently assumed that South Korea, if it found out what Japan was doing, might quickly develop a nuclear weapons force at least as large as that of Japan for reasons of national pride. However, this would likely matter very little to Japan and may actually be seen as positive. With the Chinese and North Korean threats presumably looming large for Japan, having another Asian democracy with strategic weapons might be helpful from Tokyo’s perspective.

China, for its part, would react very negatively and a crisis would ensue in Japan-China relations (or more likely, the on-going crisis between them would simply worsen). Chinese over-reaction would be the largest risk facing Japan in this scenario. North Korea’s reaction would also be unpredictable and would likely lash out in some way. These adversaries’ responses, however, might only further justify Japan’s need for a nuclear weapons program in the eyes of the world. Japan’s diplomats might make the argument that whatever Chinese proliferation followed its moves was already on-going and would have happened anyway. Given the extreme opacity surrounding China’s nuclear weapons programs and the in-

herent impossibility of proving a counterfactual argument, Japan's argument might win favor with many international observers in the democracies of the world. Elsewhere the scene would be different and more hostile, especially in China. Nonetheless, an overtly hostile China would only work to convince many in the Japanese public of the need to have nuclear weapons for their protection. If Japan began to develop a small nuclear force and China over-reacted, and then the United States refused to integrate with it, domestic politics in Japan could drive Tokyo to seek a larger nuclear force. This brings us to the next scenario.

Scenario Two: Large Nuclear Force

Another Japan than the one we know today could, for reasons that might not currently exist, decide to develop a large nuclear force. It is not within the scope of this section to discuss at length what might drive such a momentous decision, only to note that it could happen. As can be seen in the appendices, crisis and fear have a way of quickly bringing unexpected futures to pass in the history of nations. Should the United States' rebalance to Asia reverse course in a dramatic fashion, the Japanese public might lose faith in their security situation. The results of that could be profound. While Japan has been a deeply pacifistic country since 1945, its policies might change radically if the nation's life was thought to be at stake. It is well understood in Asia, but sometimes forgotten in Washington, that the only reason Japan is not already a significant nuclear power is because its faith in the protective power of United States has been near absolute.

Strategy. The question then is what Japan's strategy might be in a case where it felt the need for a large nuclear weapons force. The Japanese government would certainly have a strategy or quickly develop one in a crisis. Assuming Japan did feel it must go nuclear in a big way, its strategic objective would presumably be to build an independent and survivable deterrent against a Chinese first strike

on its cities. Japan is less likely to feel compelled to have a large nuclear force for a war with North Korea. The threat from that corner is smaller, and it is not an existential one. Therefore, Japan's strategy might be to build a large nuclear force to deter China. It might hope to conduct nuclear operations, if that became necessary, with the United States (and perhaps other friendly countries) in a coalition fashion. However, Japan may judge that it might have to fight on its own, and plan accordingly.

Doctrine and Targeting. Given the above assumptions, Japanese military planners might decide to target every possible element of China's nuclear warfighting infrastructure. There are compelling arguments for this. Japan is a densely populated island nation with little strategic depth. Once a war broke out, even a limited nuclear first-use by Beijing might prompt Tokyo to want the ability to counterattack with a disarming nuclear second strike. In Japan's mind this could ensure that China could never again engage in an act of nuclear aggression against it. Given the situation, Japan may perceive even a small number of Chinese nuclear attacks directed at its major cities as an existential threat. To paraphrase Winston Churchill, countries who feel their life is at danger will often take any measure available to them to ensure their survival.⁹

Chinese cities would make for poor targets in a nuclear war. There are too many, and they are too big to easily knock-out. More importantly, the Chinese Communist Party has a well-established track record of disregarding the welfare of the masses during times of crisis. Japan could perhaps threaten to kill over four hundred million civilians and the CCP leadership retort might be, "We have another billion where they came from. And the fallout from your attacks on us would kill you." China is simply too huge and undemocratic to deter with a counter value targeting strategy. Japan therefore might feel that it has to shatter China's entire nuclear strike force in order to survive. Target types would include national command and

9. Winston S. Churchill, *The Second World War: The Gathering Storm*, Cambridge, Massachusetts: The Riverside Press, 1948, p. 40.

control centers, nuclear warhead storage and assembly sites, missile silos, submarine bases, and all known and suspected missile launchers. If it was suspected that Chinese bombers were equipped with nuclear weapons, their airbases would be targeted too. To avoid excessive fallout that would harm Japan and others, plans might call for striking targets with extreme precision, using relatively small, deeply penetrating warheads, and airbursts when required for area targets. Surface bursts would not be allowed because of the poisonous clouds and winds they create.

Decapitating strikes against China's top leadership might be favored in theory because only the seven men on the Politburo Standing Committee would probably have the authority to order nuclear strikes against Japan. However, Japanese planners might assess that they would have little ability to know if decapitating attacks were successful given China's vast networks of tunnels and bunker complexes. China's top communist leaders could disperse to numerous underground locations and communicate through buried fiber optic cable lines during a war. Just neutralizing a few of them would not suffice.

A safer option for Japan might be to target every possible Chinese nuclear weapon and delivery vehicle. This would be a herculean task, and one that would require a tremendous effort to improve Japan's foreign intelligence collection enterprise. Finding all of China's nuclear weapons in a timely manner during a crisis would be difficult at best, and could be completely unfeasible, but it might be judged as Japan's only hope once a nuclear exchange started.

Weapons. Assuming the Japanese Joint Staff makes its operational planning assumptions relatively conservative, but with an eye to what is politically and financially possible, Japan might require an initial force of approximately 400 nuclear warheads. These would consist of a combination of low-yield (5 to 20 kiloton) and higher yield (20 to 150 kiloton) weapons. Notionally, 200 Chinese strategic targets might be selected during the first phase of the Japanese build-up. Two warheads might be dedicated to each target to reach

the total requirement of 400 warheads. Japanese planners would, no doubt, recognize that China might very likely respond by increasing its nuclear forces, and developing countermeasures to hold Japanese nuclear forces at risk. As such, Japan might plan to double or triple the number of its warheads during the second phase of its build-up. Within ten years from the time it started, Japan could require well over a thousand nuclear warheads to sustain an arms race with China.

Delivery vehicles would notionally include air and submarine launched cruise missiles. Japan would arguably want a submarine and bomber heavy strategic force. Notionally, it might need anywhere from 12 to 36 submarines and 40 to 120 penetrating bombers, depending on Joint Staff planning assumptions, studies, and war game results. Submarines would be a natural choice because Japan produces some of the best diesel-electric boats in the world. Silent and stealthy, they could be modified to launch missiles from just off the Chinese coastline. Penetrating bombers, on the other hand, would require changing current Japanese laws which view bombers as purely offensive and therefore illegal. However, if Japan felt desperate enough to build a large stockpile of nuclear weapons, it would presumably have little trouble repealing those restrictions on bombers and other “offensive” weapons. A complete paradigm shift would have already taken place. From an operational perspective, penetrating stealth bombers would be required to hit those targets deep within the Chinese interior that were out of the effective range of submarine delivered strikes. Offensive or not, bombers would likely be needed and built in this scenario.

Ballistic missiles would also be considered by Japanese strategists. These probably would be assessed as less effective than cruise missiles. This is because ballistic missiles generate a large heat bloom upon launch, and are generally easier to track and intercept in flight because they travel hot through the cold background of space on predictable trajectories before reentering the atmosphere. Stealthy, new cruise missiles could be far more difficult to track and shoot down. Ballistic missiles have other shortcomings too. They are

larger than cruise missiles, making them ill-fitted to a Japanese society that prizes the efficient use of space and admires miniaturization. Moreover, ballistic missiles are associated in the Japanese military mind with “bad guys” like China, North Korea, and Iran, whereas cruise missiles, especially American Tomahawks, are seen as “good guy” weapons.

Budget. The reader is invited to see Table 2 for a notional estimate of what various large nuclear forces might cost Japan. As was emphasized with the budget numbers seen in scenario one, it is important to remember that these are for illustrative purposes only. They may give the unwary reader a false sense of certainty. That is not the intention. Rather, what should be clear is that Japan could afford to build a large number of nuclear weapons (and their supporting infrastructure and associated delivery vehicles) if it wanted, but the burden would be heavy. The real issue is whether or not such large defense expenditures would be seen as worth it, and there is no way to assess the unknown details of this hypothetical situation. However, it might be noted that the Japanese public has shown itself remarkably willing to sacrifice for the collective good of the society during times of trouble. This makes Japan different than most other democracies. Moreover, these societal traits would probably be vastly heightened during a severe crisis.

TABLE 2. Notional Costs of Capabilities Required in Japanese Nuclear Force, Scenario Two

<i>Weapon (Unit Cost, USD)*</i>	<i>Number (Subtotal)</i>	<i>Cost Estimate**</i>
Cruise Missile, each with Low-Yield Nuclear Warhead (\$30 million)	200-600 (\$6-18 billion)	<p>High Force Number</p> <p>\$149.25 billion—plus \$2.5 billion in reoccurring costs for personnel, and some additional training and maintenance costs. This would include up to 1,200 nuclear weapons on an equal number of cruise missiles. However, the number of nuclear weapons could increase rapidly over time and might ultimately go well into the 1000s.</p> <p>Low Force Number</p> <p>\$52.35 billion—plus \$2.5 billion in reoccurring costs for personnel, and some additional training and maintenance costs. This would include a minimum of 400 nuclear weapons deployed on an equal number of cruise missiles.</p>
Cruise Missile, each with High-Yield Nuclear Warhead (\$50 million)	200-600 (\$10-30 billion)	
Nuclear Storage and Assembly Bunker Site (\$200 million)	6-12 (\$1.2-2.4 billion)	
Nuclear Engineers and Related Personnel (\$250k per person a year)	10,000 (\$2.5 billion per year)	
Modified Soryu-class Submarine (\$800 million)	12-36 (\$9.6-28.8 billion)	
Penetrating Bomber (\$500 million)	40-120 (\$20-60 billion)	
SATCOM for Survivable Command and Control (\$500 million)	1-2 (\$500 million-1 billion)	
Survivable National Fiber Optic Command and Control System (\$550 million)	1 (\$550 million)	
Hardened Aircraft Shelter for Bomber (\$50 million)	40-120 (\$2-6 billion)	

*All notional costs are highly speculative. For illustrative purposes only. In 2014 U.S. Dollars.

**Note that all total costs listed (except for personnel and maintenance costs, which are annual) would likely be spread out over a 5 to 10 year timeframe.

Implications. In contrast with scenario one, Japan's political leaders, strategists, and diplomats might assess differently the impact that a large, independent nuclear force would have on its neighbors' perceptions and actions. They might still weigh the response of the United States and the international community, but probably only a little. This would be a Japan that had already lost faith in the ability of others to help it survive a war.

The American reaction that followed would likely be difficult to gauge, and it could be mixed. American leaders who no longer felt completely able to guarantee Japan's security might sympathize with Tokyo's self-defense impulses. There would probably be some sense of relief in Washington that Japan was doing something to deter China and North Korea. Yet this would be combined with deep anxiety that a dangerous regional nuclear arms race could break out. Here the evolution of U.S. policies toward Israel might be instructive.

Large-scale regional proliferation would be a serious concern no matter how the United States responded to the notion of a strong and independent nuclear-armed Japan. It can be assumed that South Korea would develop its own nuclear weapons force. As was the case in scenario one, this possibility would probably matter very little to Japan's decision-making calculus. With a potentially lethal Chinese threat looming large for Japan, having another Asian democracy with strategic weapons might be diplomatically helpful from Tokyo's perspective.

North Korea's reaction would be similar to China's, but it would probably know (and care) less about what Japan was doing. North Korea is, after all, a highly insular country living on what is essentially borrowed time. It always might lash out violently at Japan regardless of pretext. Negative Chinese and North Korean behavior, however, might only further harden the resolve of Japan to build up its nuclear forces with all possible speed and to the largest scale resources allowed.

After a period of time, the United States might change the nature of

its military posture in Asia, and work to correct whatever problems undermined its reputation in the Japanese mind. Eventually, Japan and the United States might be successful in positioning both their large nuclear forces for combined operations. In any event, the deterrent value of Japan's nuclear force might be tested by events before that day came. Japan might have to begin planning for a force size of thousands of nuclear weapons well before 2030 if it got into a nuclear arms race with China.

Scenario Three: Improved Conventional Force

Today it is safe to assert that few in Japan want their country to have nuclear weapons. Japan is still a pacifistic country in spite of the growing external threats it faces. Most in Japan abhor weapons of mass destruction, especially nuclear ones, to a degree perhaps not seen anywhere else in the world. The public even appears to struggle with the notion of normalizing Japan's self-defense policies so they can meet internationally accepted United Nations standards. Yet Tokyo clearly sees that the trends are not favorable for its national security, and it is working hard within the framework of the U.S.-Japan alliance to improve its situation. Tokyo knows the United States needs Japan to do more to defend itself and strengthen the alliance. There are simply too few resources available—and the challengers too great—for the United States to rebalance alone. America needs Japan (and others) to help keep the regional peaceful.¹⁰

Japan may now be somewhat constrained in its ability to contribute more defense resources to the U.S.-Japan alliance, but public sentiment is changing. Japan's defense policies today are already stronger than they have been in 70 years. In the near future, the government will likely be empowered to have even stronger policies still. Assuming Japan is not willing to consider nuclear options, what might it do *conventionally* to help protect itself and its ally?

10. See Blair.

Strategy. One wise strategy for Japan might be to selectively reinforce its conventional war-fighting capabilities with the long-term political aim of undermining and defeating China's missile force.¹¹ Such a strategy might give Japan greater confidence in the American ability to project power in the region, and also allow the U.S. military breathing room to focus on shoring up its extended deterrence posture. While Washington has the ability to modernize and strengthen its nuclear and conventional forces both at the same time, its capacity to do so under the current conditions is decidedly questionable. A Japanese strategy that focused on delegitimizing and eventually defeating China's conventional threats would contribute to regional stability.

Doctrine and Targeting. Japan would not plan on attacking China first in a war. It would assume that China would strike it first in a large-scale surprise attack. Chinese strikes might involve large numbers of ballistic and cruise missiles, aircraft, ships, and submarines. Japan would have to survive the first strike before it could do anything else. Japan's military is not well positioned to do this today. Japanese military bases are too poorly defended. Tokyo's first priority would be to invest in base hardening and resiliency at perhaps 15 to 20 critical sites to include command and control facilities, airbases, and naval bases. Then Japan might invest in cyber and electronic warfare weapons capabilities designed to counter Chinese reconnaissance operations. China's conventional missile strikes would be ineffective without timely information regarding targets.

Once Tokyo was relatively confident that its military command and control system and key allied bases could survive and recover from a Chinese surprise attack, it might want to acquire a limited conventional counterstrike force. Potential targets in China might include Chinese military bases or units that were engaging in (or directly

11. For a more detailed look at this possibility, see the author's *China's Evolving Reconnaissance-Strike Capabilities: Implications for the U.S.-Japan Alliance*, Arlington, Virginia: Project 2049 Institute, February 2014, available from www.project2049.net/documents/Chinas_Evolving_Reconnaissance_Strike_Capabilities_Easton.pdf. The following discussion in scenario three draws from this study.

supporting) attacks on Japanese and American territory or fielded forces. Target categories would include strategic air defense sites, airbases, regional command posts, communications facilities, naval ports, missile launch sites, satellites, and logistics centers supporting offensive Chinese operations. This could notionally include some 200 to 300 targets and thousands of individual aim points that would be apportioned between U.S. and Japanese forces according to resources and capabilities available.

Weapons. Tokyo might seek to acquire modest counterstrike forces including air, ship, and submarine-launched Tomahawk cruise missiles.¹² The type and number of counterstrike capabilities acquired would depend heavily upon the dynamics of the U.S.-Japan alliance, Tokyo's political considerations, and Japanese domestic sentiment. Japan might also want to increase its inventories of guided air-to-surface missiles, BMD missiles, and coastal defense missiles.¹³ In addition, Japan might want to train and field a large force of military hackers that could conduct cyber operations. Non-kinetic space weapons might be considered as well for blinding Chinese satellites if Beijing began to launch attacks against Japan or its ally.

Budget. Table 3 attempts to show the costs of a notional Japanese conventional force as described by this scenario. Note that these estimates do not include the cost of conventional capabilities Japan already plans to acquire. These are new systems and capabilities that Japan arguably needs and does not possess or plan to get anytime soon. It can be confidently asserted that the numbers seen in Table 3 are significantly more "realistic" than those we saw for the

12. Nobuhiro Kubo, "Exclusive: Japan, U.S. discussing offensive military capabilities for Tokyo – Japan officials," *Reuters*, September 10, 2014, available from www.reuters.com/article/2014/09/10/us-japan-usa-military-idUSKBN0H500B20140910.

13. Sam LaGrone, "Report: Japan Interested in Aegis Ashore for Ballistic Missile Defense," *USNI News*, September 16, 2014, available from news.usni.org/2014/09/16/report-japan-interested-aegis-ashore-ballistic-missile-defense.

first two scenarios. Some open source data was available for reference. This informed the cost estimates. Nonetheless, caution is still required because the available data was not always authoritative or necessarily even applicable for Japan where a unique government, financing, and defense industrial complex exists. As always, actual weapons costs could vary considerably.

TABLE 3. Notional Costs of Capabilities Required in Japanese Nuclear Force, Scenario Three

<i>Weapon (Unit Cost, USD)* Number (Subtotal) Cost Estimate**</i>		
Deeply Buried or Hardened Command and Control Center (\$300 million)	3-6 (\$900 million to 1.8 billion)	High Force Number \$31.2 billion—plus \$200 million in reoccurring costs for personnel, and some additional training and maintenance costs
Airbase Improvement Package (\$500 million)	3-7 (\$1.5-3.5 billion)	
Naval Base Improvement Package (\$500 million)	2-4 (\$1-2 billion)	
Additional Runway Repair Personnel (\$200k per person per year with training costs)	500-1,000 (\$100-200 million per year)	
Modified Soryu-class Submarine SSG (\$800 million)	3-12 (\$2.4-9.6 billion)	
Additional Electronic Warfare Capability Package (\$500 million)	2-10 (\$1-5 billion)	Low Force Number \$ 9.5 billion—plus \$100 million in reoccurring costs for personnel, and some additional training and maintenance costs
Additional Cyber Warfare Capability Package (\$500 million)	2-10 (\$1-5 billion)	
Cruise Missile (\$2 million)	150-500 (\$300 million to 1 billion)	
Hardened Aircraft Shelter for fighter (\$8 million)	100-200 (\$800 million to 1.6 billion)	
Hardened Aircraft Shelter for large airframe (E-767, P-3C, KC-135) (\$50 million)	10-30 (\$500 million to 1.5 billion)	
*All notional costs are highly speculative. For illustrative purposes only. In 2014 U.S. Dollars.		
**Note that all total costs listed would likely be spread out over a 5 to 10 year timeframe (except for personnel, training and maintenance costs, which are annual).		

Implications. The conventional capabilities Japan might build according to this scenario would help undercut the coercive value of China's long-range ballistic and cruise missiles, and would strengthen the U.S.-Japan alliance. Japan might drastically reduce the emerging regional power imbalance. It might also take away Chinese incentives for engaging in offensive first strikes against U.S. forces deployed in Japan. From the American perspective, these would be positive developments. They could help reduce the possibility that a regional nuclear arms race might break-out.

The reaction from South Korea is likely to be relatively moderate. Few of the Japanese capabilities listed could affect Korea's interests. The exception would be Japanese cruise missiles. However, South Korea is already deploying its own conventionally-armed ballistic and cruise missiles, so it could hardly complain if Japan does some of the same things. Moreover, even a moderate Japanese counter-strike capability, properly integrated into the U.S.-Japan alliance, might contribute to deterring future Chinese and North Korean adventurism or aggression. This would clearly be in South Korea's interest.

China might react to an improved Japanese conventional force by increasing the pace of its already fast build-up of conventional and dual-capable missiles. It may also speed up its other armament programs. However, China's principal focus is aimed at defeating Taiwan. The ROC military on Taiwan already has most of the defensive capabilities listed above (and many other effective ones that are not included). Japan's acquisition of capabilities like those of Taiwan might be deemed reasonable since both countries face many similar threats.¹⁴ Japan's conventional build-up would probably not fundamentally change the nature of China's actions. However, it might discourage the Chinese military and add complexity to its operational plans.

14. For example, see the author's *Able Archers: Taiwan Defense Strategy in an Age of Precision Strike*, Arlington, VA: Project 2049 Institute, September 2014, available from www.project2049.net/documents/Easton_Able_Archers_Taiwan_Defense_Strategy.pdf.

Implications

This section will briefly address the implications and key take-aways from the above three scenarios. Indeed, the three scenarios are designed to explore the implications of alternative future pathways that Japan could take to meet its defense and security needs. As was mentioned, the three scenarios were each based upon five driving assumptions. Beyond these five assumptions, however, each individual scenario otherwise differed. What happened in one did not happen in another. These scenarios try to show how different future events might lead to different outcomes, but they do not rigorously test any particular thesis regarding which events or series of events are more or less likely to lead to Japan going nuclear or staying nonnuclear.

So what do these scenarios tell us about potential Japanese strategies? U.S. Naval War College professors Toshi Yoshihara and James Holmes have previously argued that “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.”¹⁵ These scenarios agree with this assertion. Strategic ambiguity would probably have been pursued to varying degrees in at least two of the three scenarios. Especially in the second scenario—this chapter’s most daring—Japan might have initially attempted to maintain some ambiguity.

The first two scenarios both paint pictures of nuclear breakout events in Japan. They emphasize the point made by Yoshihara and Holmes that “even barely perceptible signs of weakness in the U.S. nuclear posture (either perceived or real) could trigger alarm and overreaction in Japan.”¹⁶ Given Japan’s utter dependency on the

15. Toshi Yoshihara and James R. Holmes, “Thinking About the Unthinkable: Tokyo’s Nuclear Option,” *Naval War College Review* 62, no. 3, Summer 2009, p. 65.

16. *Ibid.*

U.S. extended nuclear deterrent for neutralizing strategic threats to Japan's security, it holds that the greater the crisis of confidence Tokyo has in Washington's commitments, the greater the Japanese push toward proliferation is likely to be in the future.

In the first scenario, Japan probably went nuclear as the result of a series of serious crises, but the situation did not ultimately reach the threshold where Tokyo felt the need to go it alone. Instead Japan wanted to quickly fold its capabilities into the preexisting, U.S.-led strategic deterrence structure. In the second scenario, the situation was clearly far worse from Japan's perspective. Japan ultimately felt compelled to become a full-fledged, independent nuclear power—even as it worked to maintain its alliance with Washington. In the third scenario, which is arguably the chapter's most optimistic, Japan did not lose faith in its American ally's nuclear umbrella, and so chose to invest in conventional capabilities to strengthen Japan's indigenous defense capabilities while simultaneously bolstering the U.S.-Japan alliance.

It can be seen in the three scenarios that Japan's security calculations can and almost certainly will change over the coming 15 to 20 years based upon the actions of China and North Korea. Japan's domestic political and economic situation will also impact its strategic policies. Bureaucratic and individual leader interests can be expected to influence outcomes as well. However, it would appear that the single most important factor impacting Japanese decisions regarding whether or not to go nuclear will be the behavior of the United States during periods of regional crisis. Strong displays of American leadership and commitment, not only to Japan but also to the defense of others in the region, are likely to have reassuring effects. In contrast, any signs of weakness, either real or imagined, could have outsized effects on long-term Japanese decision making.

What do these scenarios tell us about what doctrines, targeting schemes, and weapons Japan might develop? It might be noted by the reader that Japan gets strike capabilities in all three of the scenarios. In the first scenario, these capabilities are limited to a small

number of low-yield nuclear bombs intended for delivery by F-2s and future F-35/F-3 strike fighters. Presumably, Japan also develops other forms of conventional strike capabilities in this scenario, but these are not discussed and probably would not be significant compared to its nuclear bombs. Scenario one assumes that Japan would only target two key cities (Beijing and Shanghai) in a fashion that holds symbols of power that the Chinese Communist Party leadership would value at risk. This is not a traditional counter value strategy that targets cities for the sake of threatening the wholesale slaughter of innocent people. Given the limited range of its delivery platforms and weapons—and China's dense array of integrated air defense systems—China's nuclear strike force is not considered as a target.

The second scenario presents the reader with an unlikely black swan-type event where Japan feels compelled to develop numerous nuclear strike capabilities. Here Japan risks a nuclear arms race with China. Given the presumed severity of Japan's strategic situation in this scenario, it is posited that Japan would choose to invest in a large-scale program to outfit modified diesel-electric submarines with nuclear cruise missiles. The scenario also sees Japan building penetrating stealth bombers with air-launched cruise missiles. This gives Japan a two-legged nuclear deterrent. In terms of targeting, this scenario does not provide specifics. However, it suggests that Japan, as an independent nuclear power facing a rapidly growing Chinese nuclear force, would probably quickly move toward a counterforce approach. This approach might assume that China's rigid military organizational system could have single nodes of failure, and Japan could affect paralysis-inducing strikes without targeting every Chinese strategic launch system. However, it might be assumed from this scenario that China's own ability to target Japanese nuclear strike capabilities could quickly place Tokyo in a reactive position. This scenario could see Japan attempting to achieve strategic parity with China, but with little prospect of long-term success.

The third scenario, in contrast with the first two, presents the read-

er with a more moderate and “realistic” alternative future for Japan. This scenario assumes that the coming two decades will not be marred by any major regional security crisis that might shatter Japan’s confidence in U.S. extended deterrence. As a result, this scenario sees Tokyo decide to forego the option of developing nuclear weapons in favor of increased investments into capabilities to ensure allied power projection from bases on Japanese territory. Japan also develops its own counterstrike capabilities alongside the U.S. in order to strengthen the alliance and maintain superiority against China at the conventional level of warfare.

What do these scenarios tell us about Japanese defense budgets? Not that much, although Japan does increase its defense budget in all three. Barring some kind of dramatic economic setback or disaster, it is difficult to imagine any future scenario where Japan would not choose to incrementally raise its heretofore stagnant defense budget from its current level of slightly over one percent of GDP. Tokyo will need to keep spending more if it wants to keep a favorable balance of power against China. The U.S. defense budget is unlikely to see any significant improvements for several years to come. Put another way, Japan’s government recognizes it is falling behind, and it might logically seek to correct the situation to the greatest extent which resources and public opinion allow.

In the first scenario, Japan develops a small scale nuclear program that does not appear to create undue stress on its defense budget. This scenario posits that Japan could become a nuclear state without spending too much more than it does already on defense. The credibility of the cost estimates this scenario utilizes could be called into question. The cost problem was grossly oversimplified because so little data was available for reference. It is entirely possible that the weapons programs this scenario posits would actually cost many times as much...or far less.

The second scenario represents a sharp departure in terms of the defense budget that Japan is willing to accept. This scenario assumes that Tokyo might be willing to increase its military spending in order

to support a large nuclear weapons build-up. It is careful to note that the Japanese populace would probably only support this if the nation's life seemed imperiled. This scenario ignores the possibility that public sentiment might eventually turn against large spending increases if there appeared to be no end in sight to the nuclear arms racing and costs began to spiral out of control. As was the case with the first scenario, the credibility of the cost estimate this scenario utilizes could be called into question. It grossly oversimplifies the problem, and does not offer a program-by-program breakdown of potential costs. While such an exercise is outside the scope of this paper, it is important to note that the programs posited could actually present Japan with costs that are difficult (if not impossible) to accurately predict and control over time.

The third scenario is more sanguine in its projections because it does not see Japan engage in a sharp departure from its current defense spending patterns in order to develop, field, and maintain a nuclear deterrent force. In this case Japan might make important budgetary trade-offs that improve its defensive position. For example, Japan could decide to purchase a marginally smaller number of F-35 strike fighters in order to make investments that would maximize the protection and strategic utility of its fighter fleet. After all, more advanced aircraft and pilots are of little use if they cannot survive an adversary's first strike. Scenario three argues that investments into key capability areas such as airbase hardening and resiliency, counter-reconnaissance, and counterstrike could enable Japan and the United States to maintain a qualitative advantage over a larger adversary. However, some moderate defense budget increases would be needed to realize all the programs this scenario envisions.

While not previously discussed in detail, technology developments would be important for these three scenarios because they all take place in the future. Given that, what might these scenarios tell us about the impact of technology? Each of the three scenarios might be thought to assume that the evolution of defense technology will matter for Japan's strategic developments. Yet the scenarios appear

to assume that technological change might occur in a rather predictable and manageable fashion. They do not go as far as they might in terms of demonstrating the full extent of disruptive technologies. Inside the time horizon of the three scenarios, several technology-related problems can be forecast for the defense of Japan. The protection against offensive cyber weapons, advanced missiles, unmanned aircraft, space and near space weapons, long-range small submarines, and electromagnetic pulse (EMP) weapons are just a few. Other technological factors also deserve the reader's consideration, including the impact three-dimensional printing will have on defense production; the potential for highly energetic, lightweight propellants or batteries to be developed; and the role that semi- and fully-autonomous robotics systems will play.¹⁷ Suffice it to say that technological change is likely to play a more important role in Japan's defense than these three narratives account for. Numerous defense technology changes can be foreseen over the coming 15 to 20 years that will factor into any Japanese future nuclear or conventional weapons program. Many other changes are not foreseeable, but will happen nonetheless. All technological change will force new requirements and budgetary costs upon the military, and all will influence the fluid balance that exists between offensive (revisionist) and defensive (status quo) powers and their associated militaries.

Conclusion

This chapter has presented the reader with three scenarios that are designed to show alternative future pathways that Japan could take to meet its defense and security needs. For illustrative purposes, the three narratives were each based upon the following five assumptions: 1) American military primacy in Asia will wane; 2) China and North Korea will remain growing threats; 3) Japan will not be able to effectively partner with South Korea and Taiwan; 4) Tokyo will generally prefer a close alliance with Washington; and 5) Japan will

17. The author is indebted to Mr. Jason Aquino for these points.

not concede to Chinese and North Korean demands on issues of importance.

The three scenarios show us that there are a large number of independent variables involved in any future strategic course that Japan charts. Assuming Japan departs from its current path, one can imagine it developing a requirement for a nuclear force as small as 28 or as large as several thousand. See Table 4 for a summary of the targets and nuclear weapons (or conventional defenses) Japan might require in each scenario. One tentative conclusion these scenarios might hold is that a nonnuclear strategy focused on undercutting the coercive value of a Chinese first strike offers Japan's best hope of contributing to a more secure region in the decades ahead. Scenario three would be the best of the possible outcomes.

It must be noted that this chapter and all the findings that follow from it are incomplete and tentative. The analysis is incomplete because it rests partly on speculation and partly on currently observable trends; and straight line projections of the future (to say nothing of speculation) are notoriously misleading. The complexity of the international system is so extreme that any judgment regarding the probability of future events happening, or not happening, must always be considered tentative at best. Yet by not imagining what the future could be, analysts deny themselves the opportunity to evaluate the merits and risks associated with different options that are available to government leaders. This chapter might therefore be considered useful if it helps provide a glimpse into what alternative futures might play out over the next 15 to 20 years. That way policymakers can take better stock of their options and begin preparing for the future today.

Appendix 1: Table Four

Summary of Scenario Results for Targets, Weapons, and Other Capabilities			
<i>Scenario</i>	<i>Chinese Targets (#)*</i>	<i>Weapons and Capabilities Details</i>	
Scenario One	Beijing Area (8)	Low-yield (5-20 kiloton) nuclear bombs delivered by tactical fighter aircraft	28 to 84 bombs, depending on planning assumptions and number allotted to each target; 2 to 6 squadrons of F-2s and/or F-35s (40-120 aircraft) depending on planning assumptions and number carried by each aircraft
	Shanghai Area (6)		
Scenario Two	Command and Control Centers (30-40)	Low-yield (5-20 kiloton) and higher yield (20-150) nuclear warheads	Phase One: 400 warheads on equal number of cruise missiles. 12 submarines (12 missiles per submarine, with 1/3 of fleet constantly at sea); and 40 bombers (6 AL-CMs per bomber)
	Nuclear Warhead Storage Sites (10-30)		Phase Two: at least 800-1200 warheads on up to 36 submarines (12 missiles per sub with 1/3 fleet constantly at sea), and 120 bombers (6 AL-CMs per bomber)
	Nuclear Submarine Bases (2-6)		
	Missile Silos (45-90)		
	Known Missile Launch Units (100-300)		

**Summary of Scenario Results for Targets, Weapons, and
Other Capabilities (continued)**

Scenario *Chinese Targets (#)** *Weapons and Capabilities
Details*

Scenario Three	Strategic Air Defense Sites (30-60)	Base harden- ing and resil- iency at 15-20 sites in Japan, electronic and cyber warfare capabilities, and conven- tionally-armed Tomahawk-like cruise mis- siles and other precision strike munitions	Base hardening and resiliency efforts would include bury- ing or constructing shelters for com- mand and control centers, aircraft, power stations, fuel tanks, water tanks, personnel spaces, etc. It would also include intensive training for disper- sal operations and rapid runway repair and airfield damage repair
	Airbases (15- 25)		
	Regional Command Posts (15-30)		
	Communica- tions Facilities (15-25)		
	Naval Ports (3-6)		
	Missile Launch Units (40-75)		
	Satellites (20- 30)		
Logistics Centers (50- 60)			

*All notional targets and target numbers are highly speculative. For illustrative purposes only.

Appendix 2: Narratives to Going Nuclear

This final appendix section will present the reader with a companion reader to the three scenarios seen in the chapter. Three “narratives to going nuclear” will appear as vignettes. All three narratives are based upon the same following five assumptions that drove the chapter’s three scenarios: 1) American military primacy in Asia is waning; 2) China and North Korea will remain growing threats; 3) Japan will not be able to effectively partner with South Korea and Taiwan; 4) Tokyo will continue to prefer a close alliance with Washington; and 5) Japan will not concede to Chinese and North Korean demands on issues of importance.

Beyond these five assumptions, each individual narrative will otherwise differ in content and context. By design, what happens in one will not happen in another. These narratives are intended to help the reader imagine how different future events in Asia could influence or lead to different outcomes for Japan’s defense strategy. It is hoped that the narratives will be viewed as at least somewhat credible. Certainly, an effort has been made to make them “realistic” pieces of creative fiction.

Narrative One: Small Nuclear Force

It is 2014, and Tokyo’s national security elite view their surrounding security environment as increasingly harsh due to North Korea’s ballistic missile and nuclear weapons testing programs and China’s intrusions into Japan’s territorial waters and airspace. There are deep misgivings in Tokyo and across the region regarding the ability and willingness of the U.S. government to meet its rhetorical commitments to Asia. Affirming the unpleasant reality that the U.S. military predominance in the Pacific is waning, Admiral Blair, the former commander of U.S. Pacific Command, calls upon the government of Japan to authorize its military commanders to form joint task forces with the United States in times

of crisis. Washington's best strategic thinkers no longer believe that they will be able to balance against China's growing military power without more Japanese help.

Despite some claims to the contrary from their American counterparts, Japanese leaders become convinced that Tokyo will have to build its own strategic deterrent capabilities if the status quo is not to be altered in ways unfavorable to Japanese interests. To meet this challenge, Prime Minister Abe decides to push the Japanese legislature to adopt his cabinet's reinterpretation of the country's constitution and moves to renegotiate the bilateral defense guidelines between Japan and the United States. In tandem with these efforts, he orders a classified year-long study to examine options for the indigenous development of nuclear weapons and their associated delivery vehicles.

In March 2016, after a prolonged internal debate, the government of Japan reluctantly decides to move forward with a nuclear weapons development program as a hedge against the strategic unknown. However, these moves are tentative. As a result, the year 2018 finds Japan's program still in an embryonic state. Tokyo's overriding policy goal is to attract U.S. attention to Japanese security concerns, and many believe that nuclear weapons will not be needed to protect Japan. Despite its concerns, Tokyo holds out hope that the United States will do more to ensure Japan's defense, especially against an increasingly unpredictable China.

Three things happen over the next several months that radically change Japan's decision-making calculus. First, at a bilateral summit in Beijing the new U.S. administration moves to realize a "new great power relationship" with China and announces an arms sale freeze to Taiwan and significant reductions in RC-135 and EP-8 surveillance flights along the Chinese coastline. In return, Beijing arrests several military hackers it claims were illegally engaged in cyber warfare against the United States and greatly scales back its known cyber espionage activities. China then begins to deescalate tensions in the South China Sea with the Philippines and Vietnam,

making symbolic concessions to both. Appealing to the American president's vanity, China's Chairman Xi Jinping promises a new era of Sino-U.S. relations in which the two superpowers work together to shape the international system in mutually beneficial ways. The implication is that American allies and security partners will largely be shut out from the process.

Not long after, a U.S. Marine Corps V-22 Osprey tilt-rotor aircraft crashes into a farming community in northern Okinawa during a nighttime training exercise. With several local Okinawan residents killed, violent public protests follow the crash. This forces the U.S. government to shut its Marine Corps air station at Futenma and cancel plans for a relocation facility elsewhere on the island. The Third Marine Expeditionary Force moves its headquarters and several other facilities from Okinawa to Tinian and Guam in the Northern Mariana Islands, even as provocative Chinese maritime and air activities around the Senkakus and in the Philippine Sea continue apace.

During this transition, Japan's left-leaning *Asahi Shimbun* newspaper publishes a leaked U.S. Department of Defense planning document that states if a large-scale war with China was believed by the Pentagon to be imminent, U.S. air and naval forces would temporarily evacuate their vulnerable bases in Japan to get outside the range of Chinese ballistic and cruise missiles. This revelation creates a profound sense of betrayal in the Japanese public, and many media pundits begin to question the validity of U.S. extended deterrence. If the United States is not willing to put its troops in harm's way to defend Japan, what chance is there that it would risk its cities?

In an attempt to shore-up the damage this leak does to the alliance, Washington holds a series of defense consultations with Tokyo and agrees to harden its air bases in Japan against missile attack and to invest more in operational resiliency measures such as rapid runway repair. However, during the course of the talks, it becomes clear to the Japanese side that the United States would still be reluctant to

put its only forward-deployed aircraft carrier at risk. Tokyo must expect that the USS Ronald Reagan and most of her strike group would not be immediately available for the defense of Japan in the event of conflict with China. The venerable U.S. Seventh Fleet suddenly looks less reassuring. Making matters worse, several weeks later the U.S. Congress decides not to give the Pentagon additional funding for hardening its military bases in Japan. Instead, Congress votes to allocate the additional money to Andersen Air Force Base on the American territory of Guam.

This series of events creates a sense of panic in Tokyo's foreign policy and defense communities. From the perspective of Japan's policymaking elite, the United States is no longer in a position to guarantee Japan's security. In an emergency session on New Year's Day 2019, Japan's National Security Council votes unanimously to support the development of a nuclear deterrent as soon as possible. Within five months, Japan manufactures and deploys a 1,700 pound implosion fission bomb with an estimated yield of 11 kilotons.

Stored in an underground bunker at Chitose Air Base in Northern Japan, the weapon is initially intended for air delivery aboard modified F-2 and F-35s fighters. Over the course of the following 20 months, Japan produces another 35 weapons. These nuclear bombs are kept unassembled in a newly constructed hardened tunnel complex adjacent to Chitose Air Base, with the trigger mechanisms stored separately at a different facility on the base itself. Using mock weapons, the Japanese Air Self-Defense Force (JASDF) practices nuclear missions that stage out of the airbases at Komatsu, Tsuiki, and Naha. The actual nuclear bombs are not tested.

It is now the year 2021, and up until this point the direct budgetary costs of Japan's nuclear weapons program have been limited. Costs associated with the program include those related to: 1) The manufacture of the 36 nuclear bombs; 2) the modernization of one secure underground bunker facility and the construction of one se-

cure tunnel facility; 3) the installation of a “fail-safe” command and control system with both dedicated fiber optic and satellite communications networks linked to the Ministry of Defense Headquarters and the Prime Minister’s Office; 4) the operation of one dedicated supercomputer for modeling and simulation; 5) the training of pilots, maintenance crews, and security personnel, etc.; and 6) the expansion of Japan’s nuclear emergency response teams. Japan has become a nuclear state by spending well under two percent of its previous defense budget, or just over one billion dollars per year.

In 2022, Japan finds itself at another strategic crossroads. Washington has presented it with an attractive proposal: Tokyo can either begin the next phase of its nuclear weapons program, the development of an independent (and expensive) submarine launched, nuclear cruise missile deterrent, or it can accept American offers to integrate its small strategic forces into the U.S. extended deterrence structure. Japan, encouraged by the efforts of the United States to bolster its security and further encouraged by the success of America’s stunning post-2020 economic growth, readily opts for the latter choice. Soon Japan’s limited strategic capabilities are fully integrated into joint command structures and formalized in planning documents.

Japan’s strategy is to use its limited nuclear weapon capabilities in coordination with the United States only as a last resort during periods of high tensions. In staff level planning sessions, it is decided that both Japan and the United States would respond to an enemy nuclear attack on Japanese territory with a joint campaign against the aggressor nation. Military targets could include critical enemy airfields, naval port facilities (including submarine pens), ballistic missile base headquarters, and air defense facilities. Strategic targets could include national command centers, major urban population centers, and critical national infrastructure. The timing, scope, and intensity of the joint nuclear counterattacks would depend heavily upon the political situation, threat perceptions, available assets, and strategic objectives.

The United States and Japan decide that, as a matter of principal, urban population centers would only be targeted in a reciprocal and proportional fashion. For example, if the PRC destroyed Tokyo with nuclear attack, the United States and Japan would destroy Beijing in return. If three major Japanese cities were destroyed, three of the aggressor's cities would be destroyed. The allies also decide that under most circumstances, Japan's cities will probably (read: hopefully) not be targeted by its adversaries. As a result, strikes on potential military, not strategic, targets are given priority during annual war game exercises held by U.S. and Japanese strategic forces.

The joint U.S.-Japanese strategic force continues to evolve through the 2020s, and it proves particularly valuable in November 2027 during a major nuclear crisis on the Korean Peninsula. Despite a dangerous close call, the crisis deescalates within weeks and nuclear attacks on Japan are ultimately deterred. Several years pass, and by 2030 China and the DPRK are both fully engaged in multi-lateral disarmament talks with the United States, Japan, South Korea, Taiwan, and others. A process begins whereby East Asian countries steadily disarm, and relations between former adversaries begin to warm. The 2030s offer the prospect of a more stable and prosperous region, although many old animosities still linger.

Narrative Two: Large Nuclear Force

A series of crises occur in the lead up to the year 2020 that shatters Japanese confidence in U.S. extended deterrence and creates a sense of panic in Tokyo. The nature and severity of this situation is far worse than anything previously imagined by Japanese leaders. Several elements are at play that leads to the crises. First, the U.S. economy fails to recover from the Great Recession, and in 2016, a critical election year, isolationism washes over Washington. The U.S.-led Trans-Pacific Partnership (TPP) agreement falls apart, and trade discussions underway with European Union countries are

halted. Interest groups move to curtail the export of U.S. shale gas in the name of energy independence. This negatively impacts markets and economies around the world, and in Asia the ensuing spike in the price of oil and gas combines with a number of domestic factors to drastically weaken an already teetering Chinese economy.

In late 2018, China's communist leadership in Beijing decides to create a crisis with Taiwan as a last resort measure to shore up its weakening grip on internal social stability and distract public attention from the domestic economic failure. The People's Liberation Army (PLA) mobilizes its reserve forces in preparation for conflict, and China's internal security forces declare all public assemblies to be "illegal acts of Taiwanese fifth columnist and counter-revolutionary separatists." A state of martial law descends on China, and all foreign and social media coverage of events is blocked. When Taiwan's president refuses to enter into political negotiations based on a "One China, Two Systems" framework, Beijing responds by first shelling and then invading several of Taiwan's offshore islands in the Taiwan Strait. Several of these islands are captured with relatively few casualties on either side. However, China encounters an unexpectedly fierce battle on Tungyin Island, where Taiwanese troops fight inside a fortified network of tunnels that honeycomb the solid-granite island fortress.

During the battle, the local ROC commander orders the launch of the island's 125 ballistic and cruise missiles as well as several hundred guided rockets. These strike several Chinese airfields and naval bases supporting the invasion. Entire brigades of Chinese fighter jets are put out of action, and several surface ships and submarines are sunk in port. In addition, many of the large amphibious ships being used for the assault are sunk. Tungyin Island is finally captured at an estimated cost of 9,000 dead and wounded PLA soldiers, sailors, and pilots. Follow-on plans for a maritime blockade and invasion of Taiwan's major ports and beaches are suspended, pending a Politburo Standing Committee investigation into the disaster.

Meanwhile, Taiwanese technology companies, banks, and investment groups in the Kunshan District of Shanghai flee for Canada, the United States, England, and Australia, leaving millions of Chinese middle-class urban workers unemployed in their wake. Despite the tight grip of China's internal security forces, riots and looting break out in neighborhoods across the greater Shanghai area. Ultimately order is restored but at the cost of large-scale and brutal police violence that deepen public disaffection. Several prominent provincial government leaders and two central committee members are purged in the aftermath that follows.

For its part, the U.S. response to the 2018-2019 Taiwan Strait Crisis is found to be wanting by Japan and several other regional nations that rely on American security commitments. The White House was unusually slow to react, and the Pacific Command appeared to Japanese observers to be unwilling to respond, as it did in the 1995-1996 Crisis, with overt shows of force. To the contrary, PACOM canceled planned military exercises near Okinawa during the crisis and reduced the number and quality of its forward deployed forces in Japan to avoid appearing "unnecessarily provocative." The U.S. Congress is outraged but powerless to change the China-friendly administration's weak response.

It soon emerges that during the height of the crisis one U.S. Army Major at Kadena Air Base ordered air defense missiles to be fired at a flock of migratory birds that he erroneously identified as a possible swarm of armed Chinese drones. One of the missiles narrowly missed a civilian passenger jet landing at Naha International Airport. The Japanese national media begins to label the American military forces in Japan as unprofessional and dangerous.

Several months later an even more serious crisis develops in U.S.-Japan relations; this one involving the DPRK. It begins when Japan's National Police Agency seizes tens of millions of dollars in illegal North Korean mafia assets in Osaka. In reprisal, a group of DPRK naval commandos conducts a nighttime sabotage mission against Sado Island in the Sea of Japan, killing nearly a dozen

coastguard and civilian personnel. The next morning, five of the DPRK commandos are captured alive in a fishing boat on the way back to North Korea.

When Tokyo refuses Pyongyang's demands to release its prisoners, North Korea mobilizes several *Nodong* ballistic missile launch units and publicly threatens to turn Japan into a "sea of nuclear fire." That same day Japan's air force collects signals intelligence suggesting that North Korea plans to launch its missiles at Kanazawa, Tokyo, and Yokohama within 48 hours—and at least one of the mobilized launch units is affiliated with the DPRK nuclear program. The government of Japan desperately requests that the U.S. military conducts a preemptive strike on the North Korean launchers and missile base headquarters, but Washington dithers. The United States only commits to increased Aegis ballistic missile defense (BMD) ship patrols in the Sea of Japan.

Three days later North Korea fires nine conventionally-armed ballistic missiles at Japan. Of these, one suffers from engine failure and splashes into the sea shortly after launch; five are intercepted by Japanese and American Aegis ships; and two are successfully intercepted by a Japanese Patriot battery near Tokyo. However, one makes it through the defenses and slams into a public housing complex in greater Tokyo, killing a large number of civilians. There are also some cases of serious injury and damage to private property from falling fragments of the other intercepted missiles. The attacks (and North Korean threats to conduct follow-on attacks) create a panic across Japan. The crisis eventually deescalates without further violence, but the credibility of the U.S. extended deterrence is deeply affected. Japan is now in a state of shock.

Weeks later Japan's National Security Council votes to turn-the-key on its latent nuclear weapons capabilities program, and soon Tokyo produces its first weapon, a relatively low-yield, 30 kiloton device designed to be mated to submarine-launched cruise missiles. By mid-2020 Japan has produced 12 submarine-launched, nuclear cruise missiles, and the program reaches initial operational capabil-

ity a year later. Tokyo informs Washington of its plans to have at least one submarine conducting deterrent patrols at all times. This fails to elicit the hoped-for American response. The U.S. Secretary of State, fearing another crisis with China and North Korea, privately labels Japan's moves as: "Unproductive and unhelpful for regional security...potentially even disaster inducing."

Japan is quietly pressured by the United States to drop its proposed nuclear deterrent patrols, but while bilateral consultations are still underway, details of the emerging submarine capability are leaked to the press. This leads to an outpouring of domestic sentiment that ultimately compels Tokyo to go forward with the program. The majority of the Japanese public, now gripped by a deep fear of future enemy attacks and distrustful of American security guarantees, strongly supports the government's plan. Moreover, vociferous protests from Beijing, Pyongyang, and Seoul against the program and multiple cases of violence directed at Japanese businessmen, diplomats, and students abroad, serve to further bolster the Japanese public's strong desire for an indigenous nuclear deterrent. The United States attempts to stay neutral amidst the controversy, fearing that its respective regional alliances and partnerships could be damaged. In the end, however, its reputation is damaged on all sides. Little comes of its halting attempts to calm tensions.

In February 2022, Japan begins a series of underground and underwater nuclear tests on its uninhabited islands and sea territory in the North Pacific. These are detected and then actively covered up by the U.S. administration which is seeking to maintain a tenuous hold on the Comprehensive Nuclear Test Ban Treaty. Months later, however, the details of the tests are leaked to the Japanese media. Soon Japan conducts its first deterrent patrol with its new cruise missile submarine (SSG), a heavily modified Soryu-class boat with twelve vertical launch tubes capable of firing cruise missiles that have a range of at least 1,500 kilometers (930 miles). These are equipped with a 200 kilogram (440 pound) warhead containing 6 kilograms (13 pounds) of plutonium.

Blue crews and green crews switch places aboard the boat every month, allowing Japan to keep its first submarine at sea most of the year on extended war deterrence patrols. To decrease time in port for crew change and replenishment, several large hatches are installed to provide space for rapid resupply and repair access. In addition, a special submarine tender is built for supporting crew changes and resupply operations at sea. A second SSG is launched the following year, and a third the year after that. By 2024, Japan has one boat at sea at all times, and often two for overlapping coverage in case of combat attrition. When in port, most of the submarines are based in a hardened, wet-dock tunnel complex that has been built in Ominato Bay, near Matsu in northern Honshu, and some are stationed at the Kure Submarine Base.

By the mid-2020s, Japan's air force has successfully lobbied the Tokyo government for nuclear missions. The Japanese Air Self Defense Force soon begins fielding an indigenous, unmanned, stealth strike fighter capable of launching long-range, hypersonic (Mach 5+) nuclear cruise missiles. These aircraft are home-based inside hardened aircraft shelters at Misawa Air Base and frequently dispersed to other airbases around Japan to increase their survivability in the event of an enemy first strike.

By 2029, Japan has some 1,100 nuclear warheads and an equal number of penetrating missiles for delivering them. Throughout the 2020s, Tokyo has repeatedly approached the United States with proposals on joint targeting, but reactions in Washington are mixed, and the allies are unable to come to an agreement. Japan's growing nuclear forces, while on good terms with their American counterparts, stay completely independent of U.S. command and control. China's strategic forces have been growing rapidly since 2020. By 2029 Beijing commands an estimated 1,900 nuclear weapons that are able to strike Japanese territory.

China's buildup puts pressure on Tokyo to greatly accelerate its armaments production to reach near parity with Beijing by 2033. Fears are high that China could deliver a knockout first strike against

Japan using a combination of nuclear weapons and conventionally-armed precision strike capabilities. New Chinese stealth drones and near-space vehicles threaten Japanese airbases and ground force missile garrisons. Making matters worse, Chinese nuclear powered attack submarines and improved anti-submarine warfare capabilities threaten even Japan's most secure submarine launched nuclear deterrent. Quantity begins to matter much more than before.

A secondary strategic threat comes from the Korean Peninsula. North Korea and South Korea have both developed nuclear weapons and associated delivery vehicles capable of targeting Japan. However, internal issues on the peninsula distract from what would almost otherwise certainly be a highly unstable, multilateral nuclear arms race. Russia's economy, long in steady decline, is suddenly buoyed by new Siberian resource deposit finds and further aided by the large and growing volume of sea traffic along the Northern Passage. When Moscow accelerates its strategic détente with Beijing, even more stress is placed upon Japan's nuclear forces.

Funding Japanese nuclear forces becomes an issue that stresses the government of Japan. Tokyo has had to increase its military spending from 1.15% of GDP in 2020 to 2.95% by 2030 in order to support its strategic buildup. In the early 2020s, when the shock of North Korean missile attacks was still fresh in the public's mind, the budget increases were of little issue. However, by the end of the decade, the public sentiment has turned. There appears to be no end in sight to the nuclear arms race with China, and costs, due in large part to the development of cutting-edge unmanned technologies, appears set to spiral out of control.

Making matters worse, Japan's defense exports (principally to Southeast Asia, Australia, and North America) are in decline due to the high price of the Yen, and personnel costs have skyrocketed for reasons relating to the price of caring for retired officers and troops. The average Japanese male now lives to see his 91st birthday, and Japanese females regularly live past their centennial year. Yet the medical advances making this possible are expensive and do not

greatly improve the economic productivity of the elderly. Military personnel still retire at a relatively young age. Japan's graying society compels the military to invest in systems operated by relatively small numbers of young Japanese officers and highly educated TCTs (technical and cyber troops) that have responsibility over arrays of unmanned autonomous and semiautonomous systems.

Hopes are high in Japan for future arms control agreements, but the number and instability of the nuclear armed actors involved make coming to any diplomatic agreement a long and arduous task. The Korean Peninsula, unified under a federal government in 2030, is particularly unstable because so much of Seoul's attention is focused on the need to nation build at home while simultaneously protecting against a Chinese or Russian land invasion. Moreover, Beijing is embroiled in yet another domestic political purge, and its foreign affairs stance oscillates wildly to reflect the views of the pro-business and pro-military factions that cycle through high positions of power. Taiwan, now recognized internationally as an independent country under its revamped Republic of China constitution, is also reluctant to enter into nuclear arms control talks. The verification protocols could give Beijing unwanted leverage, and an excuse to re-insert itself into Taiwan's domestic affairs. The 2030s offer little prospect for peace and stability in East Asia.

Narrative Three: Improved Conventional Force

The alliance that binds the United States and Japan has served as an anchor of peace and prosperity in the Asia-Pacific region for over half a century, but by 2014 it is widely recognized that American power projection capabilities, enabled by military bases on Japanese territory, are under threat. While airbases and air stations in Japan could allow hundreds of American fighters and bombers to deliver strikes around the clock during a conflict, their size and static nature renders them easy to target. In contrast, U.S. aircraft carriers, which typically each support 44 strike aircraft and produce 120 sorties in

their twelve hours of daily operation during a conflict, are highly mobile and difficult to target, and therefore more survivable. However, when compared to airbases on land, carriers have little built in resiliency. Aircraft carrier decks, once damaged, are generally unusable again for the duration of any conflict.

This situation has led Japanese strategists to worry that China's rapidly emerging precision strike capabilities could give Beijing conventional strike parity in the foreseeable future and, by so doing, undermine the U.S.-Japan alliance. U.S. airbases and fleets in and around Japan are so potentially vulnerable to the PLA's long-range precision strike capabilities that some American observers have begun calling for a strategy to conduct "off-shore control" and abandon the U.S. commitment to a robust forward deployed presence in Japan. Others have suggested that the United States should appease China by limiting its arms sales to security partners like Taiwan. These developments, while not reflective of official policy in Washington, have served to heighten Tokyo's sense of a looming security crisis.

Japan's security situation, while serious, gets a boost in 2015 when the United States agrees to bilateral talks on increasing Tokyo's access to American strike capabilities previous deemed to be too offensive by the Japanese. These talks include possible offers to provide Japan with advanced submarine and ship launched Tomahawk cruise missiles and offensive cyber warfare capabilities. Japan also expresses interest in shore based Aegis systems for next generation missile defense. The same year, Washington and Tokyo release an important document, the *2015 Guidelines for U.S.-Japan Defense Cooperation*. This agreement modernizes the U.S.-Japan alliance and allows for a new era of joint strategic development. However, these measures, while necessary, are not sufficient by themselves. In order to assure the long-term health of the alliance—and with it regional security and prosperity—there are three additional areas of investment that decision makers in Washington and Tokyo begin to make in the 2015 to 2025 timeframe: (1) Base hardening

and resiliency, (2) counter-reconnaissance, and (3) conventional counterstrike.

Base Hardening and Resiliency. The vulnerability of command and control centers, airbases, port facilities, logistics nodes, and other critical military installations in Japan is a serious problem. Tokyo leaves the vast majority of its air combat power sitting on parking ramps in the open or in unhardened hangars at its airbases. That begins to change in 2018. For the price of five F-35 fighter aircraft, the Japanese Air Self Defense Force begins to construct 100 advanced hardened aircraft shelters on Okinawa and Kyushu capable of protecting up to 200 fighters. This equates to spending some 500 million dollars to protect 10 billion worth of combat assets. Similarly, for the cost of one littoral combat ship, the Japanese Maritime Self Defense Force and the amphibious component of the Japanese Ground Self Defense Force work to construct shelters and hardened hangars capable of protecting a combination of up to 188 navalized fighters, helicopters, and tilt-rotor aircraft by 2020.

Other exposed aircraft are protected inside revetments designed to mitigate the effects of small submunitions and near misses. These prove particularly useful for protecting large, high value aircraft unable to fit inside most hardened shelters, such as Global Hawk UAVs, P-8s, P-3Cs, etc. Revetments are also constructed to protect living and work facilities for the thousands of personnel that are required to keep combat aircraft wings operational. Dozens of miles of revetments are constructed for the cost of a small number of hardened aircraft shelters. Likewise, investments are made into redundant and deeply buried command and control centers; extra or alternate runways, taxiways, and parking ramps; and hardened power, fuel, and logistical facilities. Electro-magnetic and visual deception techniques—combined with force dispersal—are also invested in to confuse enemy intelligence.

The United States and Japan begin to develop the potential to operate effectively in a dispersed manner across nearly 100 civilian airfields in Japan that have long enough runways to support combat

aircraft, and a particular focus is accorded to Ishigaki Airport and Shimoji Airport in the Ryuku Islands. However, investing in hardening, dispersal, deception, and other relatively affordable and effective defense measures is not enough. Once adequate preparation is made for all critical platforms and personnel to *survive* missile raids, investments begin to be made in maintaining the capacity to quickly *recover* from attacks and get back in the fight.

The Japanese bolster their military engineering teams for heavy repair missions by providing them with rapid runway repair and airfield damage repair kits and extra funding for frequent training exercises. Engineering teams at Naha Air Base and Kadena Air Base become some of the fastest and most effective in Asia. The Japanese demonstrate their ability to drastically reduce the impact of potential missile attacks and show that they can quickly retake and retain the initiative after being attacked. This has the effect of undercutting the PLA's strategy through the disruption of its core planning assumptions, and it alters incentives to engage in first-strike operations. More importantly, these investments in hardening and resiliency demonstrate resolve in the face of a serious adversarial threat and send the message that the U.S.-Japan alliance is fully committed to regional defense.

Counter-Reconnaissance. Another critical, but previously overlooked and underemphasized, element required for protecting the allied ability to project power in the face of China's emerging capabilities is counter-reconnaissance. In 2019, the United States and Japanese militaries begin a joint program to develop the means to wage a blinding campaign against the sensor and communications networks that are foundational to PLA missile operations. The United States and Japan develop a range of capabilities for denying the PLA access to its reconnaissance capabilities.

At the low end of the spectrum, this includes special operations missions to board and detain the crews of suspected surveillance vessels and to attack coastal radar sites. It also includes programs for engaging airborne sensors, land based radars, and

other relatively soft PLA targets with electronic warfare or cyber attacks. At the higher end of the spectrum, it includes capabilities for disabling critical sensors onboard Chinese reconnaissance satellites in low earth orbit. Initially, the easiest way for the United States and Japan to assure the incapacitation of Chinese satellites is to engage them directly with specially modified SM-3 missiles. However, the threat of producing an unacceptably high level of space debris argues against such attacks, and by the early 2020s a number of non-kinetic weapons are secretly developed and deployed for the mission.

Once developed, high-powered lasers and other directed energy weapons are employed by the United States and Japan for the counterspace mission. Ultimately the allies decide that the priority targets for any counter-reconnaissance campaign waged against the PLA would be the command and control nodes where the PLA integrates its reconnaissance and strike capabilities. These command and control nodes are generally located in remote areas in deeply buried bunkers. Nonetheless, they are closely studied and found to be vulnerable to cyber attacks as well as some forms of physical sabotage. The allies begin preparing the battlefield to the greatest extent possible with both cyber and human assets. During a conflict, it is thought that something as simple as sending an intelligence asset (or penetrating cruise missile) to cut shallowly buried PLA fiber optic lines could make a significant contribution.

Conventional Counterstrike. Beyond base hardening and counter reconnaissance, conventional counterstrike capabilities become viewed by Japan as essential for deterring and defeating potential PLA missile attacks. While missile defense and counter-reconnaissance capabilities serve to mitigate the worst effects of enemy strikes, they are unable to respond to them in a proactive manner. Only conventional counterstrike capabilities against Chinese forces would allow American and Japanese forces to quickly regain the initiative after a PLA first strike. In the era of missile-centric warfare, targeting the archer as well as

the arrow is a deemed essential.

To deter China from exploiting its capabilities for launching potentially devastating attacks on Japanese targets and forward-deployed U.S. targets, military and political leaders in Tokyo and Washington slowly develop a consensus on conventional counterstrike. After something of a late start, from 2020 to 2025 the Japanese military develops and demonstrates a credible capacity for holding selected PLA's command posts and missile launch units at risk while maintaining allied air superiority and sea control.

Tokyo studies options for deploying conventionally-armed ballistic and cruise missiles. However, Tokyo opts against ballistic missiles in favor of a less controversial program to partner with American defense companies to produce next generation, long range cruise missiles. This program benefits from Japan's cutting edge aerospace engineering capacities and has the added benefits of increasing joint operability and bringing allied unit costs down.

An unprecedented strengthening of the alliance follows in the 2020s. While several small crises occur that involve China and North Korea, Japan does not seriously consider developing nuclear weapons. The U.S. extended deterrence holds. Japan continues to invest in conventional capabilities to address gaps in the ability of the U.S.-Japan alliance to maintain a favorable balance against China. This includes a number of initiatives to improve the hardening and resiliency of essential command posts, air bases, and naval bases.

Japan also invests more into developing other forms of ballistic missile and cruise missile defense including rail guns, high powered energy weapons, electronic warfare, and cyber warfare. With Japan's help shoring up its otherwise eroding conventional superiority, the United States is better placed to concentrate on maintaining its extended nuclear deterrent and does so successfully throughout the 2020s and into the 2030s. By 2030, the threat of a

major conflict in Asia seems increasingly remote. The 2030s open with the prospect for an unprecedented level of prosperity, freedom, and strategic stability in the region.