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Will Taiwan Contemplate a “Nuclear Option”?  
Security Imperatives and Normative Transformation

Vincent Wei-cheng Wang*

This paper examines the role of nuclear weapons, if any, in Taiwan’s defense strategy. Facing acute existential threat and having no representation in global and regional security forums, Taiwan has nonetheless chosen nuclear restraint. This is due to instrumental considerations and normative change. While Taiwan is not completely certain about the commitment of its key backer – the United States -- to its security (a policy known as “strategic ambiguity”), the main pillars to its security remain conventional deterrence and America’s tacit nuclear umbrella – in addition to its economic strengths and democratic appeal as soft power. The paper explores Taiwan's attempt during the Cold War to develop nuclear weapons, the conflicting objectives of the United States, and the post-Cold War normative evolution. It also analyzes the (extraordinary) conditions under which Taiwan might contemplate a “nuclear option,” assesses the pros and cons of this action, and argues that maintaining a “virtual” or near-proliferating capacity is advisable in the light of evolving trends in the military balance (especially conventional force) in the Taiwan Strait.

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Key words: Taiwan, deterrence, nuclear weapons, strategic ambiguity, Taiwan Relations Act, Institute of Nuclear Energy Research

Introduction: Taiwan’s Security Situation and Nuclear Stance

The 9 October 2006 nuclear test conducted by North Korea resurrected the debate over the political and strategic utility of nuclear weapons. In East Asia, where adjoining states with historical enmities are experiencing rapid but differential rates of growth that provide the financial means for developing such disruptive military technologies as ballistic missiles and nuclear weapons, the specter of a Second Nuclear Age \(^1\) emerging as a result of intensified security concerns can not be discounted.

Among all the Asian states, Taiwan (officially, Republic of China, or ROC) arguably faces the most acute security situation. On the one hand, its main security threat, China (or People’s Republic of China, PRC), claims sovereignty over Taiwan and has never renounced the use of force against Taiwan. Already a nuclear weapon state, China’s military and economic power has been increasing so rapidly that many analysts worry that the cross-Strait balance is shifting (or has already shifted) in China’s favor. \(^2\) The threat posed by China is threatening Taiwan’s very existence.

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and way of life

On the other hand, due to its diplomatic isolation (largely as a result of China’s strangulation), Taiwan has no recourse to multilateral security organizations such as United Nations Security Council or ASEAN Regional Forum (ARF). No major country except the United States has a substantial security relationship with Taiwan. But even the U.S. support is not unconditional. The U.S. abrogated its 1954 defense treaty with Taiwan (hence cancelling a formal nuclear umbrella over Taiwan) in 1978 as one of the conditions for normalizing relations with the PRC. There is considerable debate over whether U.S. “residual” commitment to Taiwan’s security under Taiwan Relations Act (TRA) constitutes an implicit nuclear umbrella. For example, the TRA declares that it is the policy of the United States to “consider any effort to determine the future of Taiwan by other than peaceful means...a threat to the peace and security of the Western Pacific area and of grave concern to the United States,” to provide Taiwan with “arms of a defensive character,” and to “maintain the capacity of the United States to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people on Taiwan,” but it does not obligate the U.S. to defend Taiwan in case of Chinese hostilities against Taiwan. This policy of “strategic ambiguity” was designed to keep both China and Taiwan in check. It is thus clear that unlike Japan or South Korea – both treaty allies to the U.S., Taiwan cannot take America’s extended deterrence for granted.

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For these understandable reasons, Taiwan has often been identified as a country with a good reason or considerable potential for possessing nuclear weapons as part of its comprehensive strategy of survival in an adverse security environment. For example, a recent *Foreign Policy* online article asks if Taiwan would be one of the “next nuclear states” due to its past development and acute security threat. A recent article by Prof. Stephen Peter Rosen, a national security expert at Harvard, in *Foreign Affairs* also lists Taiwan as a possible nuclear state, along with Japan, if nuclear arms races emerge in East Asia. Prof. Andrew Mack of Australian National University grouped Taiwan along with Japan, South and North Koreas in a category called “virtual nuclear powers” who could acquire nuclear weapons in a relatively short period of time but have chosen not to do so. In other words, these analysts think the main constraints to Taiwan’s becoming a nuclear state are political, rather than technological.

Yet it is widely acknowledged that today Taiwan does not have nuclear weapons, but has a fairly sophisticated civilian nuclear power industry, which produced over 20 percent of Taiwan’s total electric power in recent years.

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Why Taiwan has chosen nuclear restraint and instead to rely upon America’s tacit nuclear umbrella yet at the same time maintain substantial civilian nuclear expertise? This article argues that given its peculiar sets of domestic and external constraints, Taiwan’s strategy of maintaining a “virtual nuclear option” is a prudent strategic choice. The reasons are complex, and include both normative and instrumental considerations, as this article will explain.

Officially, Taiwan adheres to the nuclear non-proliferation regime.9 The government’s position on nuclear weapons is a categorical “four noes” policy—Taiwan will never “develop, produce, store, or use” nuclear weapons,10 or an even stricter “five noes” policy (the above “four noes” plus acquisition).11 The current ruling party, Democratic Progressive Party (DPP), went a step further by espousing a “nuclear-free homeland” (feihe jiayuan) on Taiwan and has established a special agency within its cabinet (Executive Yuan) to promote this vision.12

Because non-proliferation is a prevailing international norm and a paradigm dominating U.S. foreign policy, even though Taiwan is not a member of the UN, as a client state to the U.S., adhering to the non-proliferation regime is important to winning its patron state’s support.

9 Michael Tsai, Deputy Minister of National Defense, interview by the author, Taipei, Taiwan, 23 December 2005.
The logic is this: by eschewing its independent nuclear capability, Taiwan hopes to enhance the credibility of America’s extended deterrence — albeit one that Taiwan has never been completely certain about.

Still, a few scholars, analysts, and watchdog groups have linked Taiwan to nuclear weapons and every few years reports speculating Taiwan’s past nuclear programs or future intentions would surface. The Nuclear Threat Initiative (NTI), a non-profit organization founded by CNN Founder Ted Turner and former U.S. Senator Sam Nunn, estimates that “Taiwan probably possesses the technological expertise necessary to develop nuclear weapons, but U.S. pressure and the possibility of a pre-emptive strike by China have prevented a resumption of the nuclear weapons program.”

A key reason for this lingering suspicion is that Taiwan apparently attempted to develop a nuclear weapons program in the 1960s-70s, and then again in the 80s, which ended in 1988 due to intense pressure from the U.S. Carnegie Endowment for International Peace classifies Taiwan as one of those nuclear “abstaining countries” (or states formerly

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possessing nuclear weapons) as of 1995. This group refers to those industrialized countries with the technological base, but not the desire, to develop nuclear weapons, including Argentina, Australia, Brazil, South Korea, and Sweden.\(^{15}\)

Rather than deciphering these inconclusive reports and subsequent official denials or clarifications, this article adopts a more promising approach for understanding the role of nuclear weapons, if any, in Taiwan’s security strategy. This approach aims to systematically analyze Taiwan’s “virtual nuclear option” by taking into account both its capabilities and intentions.

These two interrelated aspects roughly correspond to “supply-side” and “demand-side” factors, respectively. The former relates to feasibility (whether Taiwan can do it), whereas the latter relates to desirability (whether Taiwan ought to do it). In arms control lexicon, supply-side strategies seek to prevent the transfer of weapons technologies to would-be proliferators, whereas demand-side strategies seek to address the security concerns behind the drive for the bomb.\(^{16}\)

In the case of Taiwan, on the issue of nuclear weapons, both its capabilities and intentions are conditioned by broader issues such as global nonproliferation regime, prevailing technological availability, regional security environment, and threat perception, but none more


\(^{16}\) Andrew Mack, “Potential,”: 51-52.
important than U.S. security and foreign policy, relationship with the U.S., and robustness of U.S. security commitment. Hence, relying on the conventional discourse on nuclear weapons (the nonproliferation paradigm), which takes the supply-side perspective and has a strong normative overtone, is likely to produce a partial and incomplete account (and set of recommendations) for Taiwan’s nuclear choices. As the history of Taiwan’s past nuclear program shows (see below), these larger strategic and diplomatic factors on the demand side played a key part in shaping Taiwan’s previous nuclear choices. They will also be crucial for understanding, or even predicting, Taiwan’s future nuclear choices.

The rest of the article is divided into four sections. The first section provides a succinct overview of Taiwan’s nuclear weapons program during the Cold War, deduces the most important lessons from that experience, and discusses the complex U.S. attitudes and motivations. The second section discusses Taiwan’s current nuclear programs. The third section assesses the rationales and constraints for Taiwan’s revisitation of the nuclear option. The fourth section provides policy recommendations.

Taiwan’s Nuclear Programs and Ambiguous U.S. Policies During the Cold War

The Taiwan case confirms many insights from mainstream theories on the role of nuclear weapons in a country’s security policy, but also adds its unique complexity. It can also be fruitfully compared with those other countries facing severe security challenges (e.g., Israel). It is thus useful to begin discussing Taiwan’s past, present, and future nuclear policy in the context of the larger issue of why states want nuclear
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weapons.

States seek nuclear weapons for a variety of reasons: coping with an acute threat, prestige, political clout, and economic benefits. Scott Sagan contrasts three “models” of states’ nuclear decisions: (1) “the security model”: states build weapons to increase national security against foreign threats, especially nuclear threats; (2) the “domestic politics model” envisions nuclear weapons as political tools used to advance parochial domestic and bureaucratic interests; and (3) “the norms model”: nuclear weapons decisions are made because weapons acquisition, or restraint in weapons development, provides an important normative symbol of a state’s modernity and identity.

Whereas great powers, especially the superpowers, use nuclear weapons to maintain deterrence, their client states usually must rely on the patron states’ extended deterrence, or occasionally, with their patrons’ acquiescence or even assistance, their independent deterrent (e.g., Israel). If extended deterrence -- one nation (the patron) threatens action if any attack is made against a third party or ally (the client state) -- is credible (the metaphor is “nuclear umbrella”), then there will be less incentive for the client state to seek nuclear weapons. The client state (U.S. being the main guardian of the global non-proliferation regime) can

thus accomplish the dual goal of preserving the international norm of non-proliferation and enhancing the credibility of its commitment to its allies.

The patron can bolster the credibility of its extended deterrence by various signals, such as establishing treaty or legal obligations for its defense of the client state (either bilaterally, such as U.S.-Japan Alliance, or multilaterally, such as North Atlantic Treaty Organization) or storing nuclear arms on the soil of the client states. For example, recently declassified material shows that the U.S. secretly deployed nuclear bombs in 27 countries and territories during the Cold War.\(^1\) In the case of Taiwan, the U.S. started storing nuclear weapons on Taiwan in January 1958, and completed their withdrawal in July 1974, as part of Nixon’s attempt to improve U.S. relationship with the PRC.\(^2\) In a classic patron-client relationship, the patron fears entrapment (fighting a war that is not in its national interests), while the client fears abandonment. The attitudes and actions of the patron thus play a decisive part on the client state’s perception of security and choice of security strategies.


Because the U.S. was, still is, and is likely to remain, Taiwan’s chief security guarantor, U.S.-Taiwan relationship has displayed many of the characteristics mentioned above. Taiwan’s nuclear programs – civilian or military – were and still are critically shaped by U.S. policies, and these policies have changed over the years in response to changing U.S. national interests.

During the Cold War, in the nuclear context, the U.S. sought to achieve three goals: (1) nonproliferation and arms control (to enhance global security and norm development), (2) extended deterrence (to preserve alliance solidarity and U.S. reputation), and (3) commercial interests (to promote American nuclear power industry). This three-pronged strategy was linked by the quid-pro-quo mandated in the 1968 Nuclear Non-proliferation Treaty (NPT): The five nuclear weapon states (U.S., USSR, Britain, France, and PRC) agreed not to transfer nuclear weapons or other nuclear explosive devices to other states and non-nuclear weapon states agreed not to seek or develop nuclear weapons in return for their “inalienable right” to use nuclear energy for peaceful purposes (Article IV, Sec 1), subject to IAEA safeguards. Under NPT, nuclear powers have a responsibility to assist developing countries with their energy needs (Article IV, Sec 2). 23

These multiple goals – sometimes complementary and sometimes contradictory – are clearly at work when we examine the various roles U.S. played in Taiwan’s civilian and military nuclear programs during the Cold War.

23 For the text of NPT, see http://disarmament2.un.org/wmd/npt/npttext.html.
Taiwan's civilian nuclear power and military nuclear weapons industries started roughly the same time – in the 1960s. It is useful to consider these two industries together not only because there existed substantial technological overlap between them (the first stage of making nuclear weapons – the production of fissile materials, such as uranium-233, uranium-235, or plutonium-239 – is the same as generating nuclear power)\textsuperscript{24} but also because the U.S. played key roles in both. Officials are still reticent about Taiwan's abandoned nuclear weapons program, but in recent years, more information has emerged. Rather than belaboring with details, I summarize the key developments of Taiwan’s nuclear programs during the Cold War in Table 1 and refer to the references in note 21.

\begin{table}[h!]
\centering
\caption{Taiwan's Nuclear Programs During the Cold War}
\begin{tabular}{|c|c|}
\hline
Year & Event Description \\
\hline
1964 & PRC threatens to use nuclear weapons to "liberate" Taiwan. \\
\hline
1967 & Taiwan's Hsin Chu Project begins. \\
\hline
1972 & Chiang Kai-shek tries to persuade U.S. President Lyndon Johnson to take out China's nascent nuclear arsenal to no avail. \\
\hline
\end{tabular}
\end{table}

From this table, we can deduce a few lessons. First, Taiwan's nuclear aspirations were driven by an acute sense of insecurity. The \textit{genesis} of the Hsin Chu Project was a direct result of China's successful explosion of a nuclear bomb in 1964. The PRC had threatened to use force to "liberate" Taiwan. The prospect that the PRC could now use its nuclear weapons to wipe out Taiwan was deeply unsettling to ROC President Chiang Kai-shek (his reaction could be compared to U.S. President Dwight Eisenhower's reaction against the Soviet Union's successful Sputnik launch in 1957). Chiang tried to persuade U.S. President Lyndon Johnson to take out China's nascent nuclear arsenal to no avail. So he, and especially his son, Chiang Ching-kuo, resolved to develop an indigenous nuclear weapons program.

\textsuperscript{24} Chien Chung, \textit{Core of the Bomb}, 137.
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There was dissent. For example, Prof. Ta-you Wu, former president of Academia Sinica in Taipei — and then director of the Science Development Advisory Committee of Taiwan’s National Security Council (NSC) wrote to Chiang to oppose the Hsin Chu Project on the grounds that the plan underestimated the true costs, risked confrontation with the U.S., and overestimated the chance of success.\(^{25}\) However, at that time Taiwan’s authoritarian political system overruled people like Wu, obviated an informed public debate, and permitted the clandestine execution of the project.

Taiwan’s military fully supported the Hsin Chu Project by providing manpower and resources. To illustrate the heavy financial burden of this five-year $140 million (NT$4.8 billion) project, Taiwan’s central government net expenditure in 1968 was only NT$32.2 billion\(^{26}\) -- in other words, the cost of the Hsin Chu project amounted to 15% of Taiwan’s central government net expenditure.

There was another impetus: national pride. In 1957, Drs. Chen-ning Yang and Tsung-dao Lee, both Ph.D.s from the University of Chicago, became the first ethnic Chinese scientists to win the Nobel Prize in Physics.\(^{27}\) This inspired many young, bright, and idealistic students in Taiwan to study nuclear physics, and the military tapped into this talent


\(^{26}\) Chung, Core of the Bomb, 158.

The experience of Dr. H is illustrative. After graduating from one of Taiwan's best high schools, he chose to study physics at the military-run Chung-cheng Institute of Technology (CCIT), which is also located in Lung Tan, like CSIST and INER, about 45 minutes by car south of Taipei. Because NTHU had the only instructional reactor in Taiwan at that time, CCIT students spent much time at NTHU and many of them later, after receiving advanced degrees from abroad, became faculty at NTHU. After college, Dr. H was assigned to INER, and then after working there for two years he was sent to study in the U.S. He received a Ph.D. and had a postdoctoral fellowship in the U.S. before returning to INER. He recalled,

At that time, INER employed over one thousand people. Two-thirds were technicians and administrative support staff. On average, each researcher had two support staffers. The pay was excellent and the morale was high. I felt proud about what I was doing, because I was young and more prone to following orders back then. 28

The reactor purchased by INER, the TRR, was the same design as Canada's NRX (National Research eXperimental) reactor; it had a "cousin" in South Asia -- the CIRUS reactor India purchased in 1960 (Fourteen years later, in 1974, India made and tested nuclear weapons from the plutonium produced from that reactor). At full operation, TRR

28 Dr. H, former INER researcher, interview by the author, Taipei suburb, Taiwan, 21 December 2005.
could produce ten kilograms of weapon-grade plutonium a year; so in twelve years it could produce sufficient weapon-grade plutonium.\footnote{Chung, \textit{Core of the Bomb}, 155); interview with Dr. H.}

TRR reached critical mass on 3 January 1973. Taiwan's nuclear weapons program accelerated in the 1970s. This acceleration correlated directly with the nation's deteriorating diplomatic fortune and security outlook: ROC was expelled from the United Nations in 1971, and thereafter all UN-affiliated organizations.\footnote{The U.N.'s recognition of the PRC as the only legal government of all China – the so-called "one China"- policy raised the interesting possibility that Taiwan could claim to nuclear weapons state status, but in the end, Taiwan decided to accede to the requirements of NPT and International Atomic Energy Agency (IAEA) and through a trilateral nuclear agreement, the U.S. became the ultimate guarantor of Taiwan's non-nuclear status – facilitated by IAEA inspections. See Mitchell, "Taiwan's Hsin Chu Program", 297-8.} The enunciation of the Nixon Doctrine signified the United States' desire to gradually disengage from East Asia. In 1972, Nixon visited mainland China, and signed the Shanghai Communiqué, committing the U.S. to normalize relations with China. On December 15, 1978, President Carter announced that the U.S. would recognize Beijing and sever diplomatic ties with Taipei on January 1, 1979. In fact, Carter accepted all the three conditions demanded by China since the early 1970s – withdrawing troops from Taiwan, abrogating the USA-ROC Mutual Defense Treaty, and breaking diplomatic relations – without providing security commitment to Taiwan.\footnote{Benefiting from the Freedom of Information Act and recent declassification of certain records, James Mann's \textit{About Face: A History of America's Curious Relationship with China} (New York: Vintage, 2000) provides a fascinating account of the negotiation process in the early 1970s toward normalization.} Congress enacted the Taiwan Relations Act (1979), which mandated the U.S. to help Taiwan defend itself and formed the basis of a
policy known as “strategic ambiguity” regarding America’s commitment to Taiwan’s security. Operationally, the policy of “strategic ambiguity” seeks to achieve double deterrence – against Beijing’s use of force and against Taipei’s provocation – by strategically refraining from specifying the precise course of action the U.S. may take so as to encourage prudence by all sides. These diplomatic setbacks and improved U.S.-PRC relations heightened Taiwan’s insecurity and fear of abandonment by the U.S.

The second lesson from this period is that the attitudes and actions of the United States – informed by its national interests -- was a key enabling or constraining factor in Taiwan’s tortuous nuclear program development. As stated earlier, during the Cold War, the U.S. sought to pursue a number of goals – preventing the spread of communism, nuclear nonproliferation, commercial interests for nuclear energy industry. In the 1950s-60s, the U.S. appropriated the “one China” myth propagated by both Chiang Kai-shek and Mao Zedong (albeit they differed on who represented this one China) by recognizing ROC as the real China, thus isolating Communist China. In 1954, Eisenhower and Chiang signed a mutual defense treaty, thus formally incorporating Taiwan under U.S. extended deterrence and its alliance system in East Asia.

U.S. assistance came in various forms. Diplomatically, the U.S. supported the ROC’s membership in the UN and stalled the PRC’s membership quest until 1971. Economically, the U.S. initially provided

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economic assistance, and then replaced aid with unilateral trade concessions, known as Generalized System of Preferences (GSP), for Taiwan’s manufactures exports. Militarily, the U.S. Seventh Fleet patrolled waters off Taiwan – preventing Chinese attacks against Taiwan and restraining Taiwan from attacking the mainland. The U.S. military even stored nuclear weapons on Taiwan and offshore islands, aimed at dozens of cities and military targets on the mainland. During the Offshore Island Crises of 1955 and 1958, Eisenhower both contemplated using those nuclear weapons against the PRC and was concerned about “embroilment” in Chiang’s futile campaign to militarily retake the mainland, which could trigger a wider conflict involving the two superpowers.\textsuperscript{33} Since Eisenhower had told Chiang that those offshore islands were indefensible from a military standpoint, his dilemma over the proper response to the Offshore Island Crises was a good illustration of the fear of entrapment by the client state.

Taiwan’s civilian and military nuclear programs benefited from either direct or indirect U.S. assistance. The U.S. was not only the guarantor of Taiwan’s non-nuclear weapon state status, but also the chief supplier of key material, facilities, and technologies of Taiwan’s nuclear power industry. In other words, both the U.S. and Taiwan lived up to the reciprocal “bargain” under NPT discussed earlier. Table 2 shows that all of the state-owned Taipower’s eight light-water reactors (six in operation and two being constructed) used to generate electricity are provided by leading American nuclear companies. These American companies typically sell package deals, which also include fuel and repossession of

\textsuperscript{33} Tang Tsou, \textit{The Embroilment over Quemoy: Mao, Chiang and Dulles} (Institute of International Studies, University of Utah, 1959).
spent fuel. By doing so, the U.S. does live up to its custodial responsibility of helping Taiwan’s energy needs, but it also benefits American commercial interests and ensures Taiwan’s non-nuclear status.

(Table 2 about here)

Other than some hydraulic power, Taiwan lacks any significant raw energy sources and imports over 97% of raw materials for its energy needs. Compared to other sources of energy, such as oil and natural gas, nuclear fuel, thanks to its compactness and density, is a better choice from a strategic standpoint (less susceptible to wartime energy shortage or blockade). Nuclear power thus appears an attractive source of energy. It now provides over 20% of Taiwan’s electricity needs.

U.S. attitude toward Taiwan’s military nuclear program was even more intriguing. The U.S. assisted Taiwan in getting the TRR, the nuclear reactor suspected in Taiwan’s nuclear weapons program, from Canada, and enriched uranium from South Africa. Most of Taiwan’s scientists in nuclear physics and related fields studied in the U.S. or Canada. Thus, it would seem that the U.S. permitted (or even wanted) Taiwan to possess certain nuclear capabilities as a potential strategic counterweight against the PRC. Yet at the same time, as the main architect and arguably chief enforcer of the nonproliferation regime, the U.S. did not want Taiwan’s nuclear program to get out of control, triggering instability or ripple effects in cross-Strait relations and East Asian security. Starting from the 1970s, the imperative for improving relationship with the PRC as a counterweight against the Soviet Union also required the U.S. to reassess its previous “benign” or “permissive” attitude toward Taiwan’s nuclear program.
The U.S. dealt a decisive blow to Taiwan’s nuclear program in January 1988. Col. Chang Hsien-yi, Deputy Director of INER, defected to the U.S., carrying with him sensitive information about the nuclear weapons program at INER. It turned out that during his study in the U.S., Chang was recruited by the American Central Intelligence Agency. After returning to INER, he monitored Taiwan’s nuclear program for the U.S. government. As an indication of the severe impact of Chang’s defection brought upon Taiwan’s secret nuclear program, President Chiang Ching-kuo died only few days after Chang’s “disappearance.” Armed with incriminating evidence provided by Chang, President Reagan demanded the new Taiwan President Lee Teng-hui to conclusively and verifiably shut down its nuclear program. The Chang Hsien-yi Incident marked the decisive end of Taiwan’s nuclear weapons program.

Since 1988, Taiwan’s official position has been that it will not apply its scientific know-how to build nuclear weapons. Whereas those closely involved in Taiwan’s nuclear program (e.g., President Chiang Ching-kuo and General Hau Pei-tsun, Chairman of Joint Chiefs of Staff) understandably viewed Chang as a traitor and the single biggest setback for Taiwan’s nuclear aspirations, Americans generally viewed the end of Taiwan’s nuclear program as a success. For example, Bulletin of the

34 Tim Weiner, “How a Spy Left Taiwan in the Cold.” New York Times (20 December 1997): A7; “Former Top General Reveals Secret Nuclear Weapons Program” (6 January 2000): 1. Chang had apparently been recruited by the CIA some ten years ago during his doctoral study at the University of Tennessee. There were more suspected moles planted by CIA inside INER. Interview with Dr. H.
Atomic Scientists hailed this as a “nuclear nightmare averted.” Amb. James Lilley, a former intelligence official and the only American who had been the top envoy to Taiwan and China, said that he believed that it was time for the Chang Hsien-yi case to be “publicly acknowledged as a success, a classic in the annals of intelligence.”

However, many years later, today in Taiwan’s open environment, opinions about Chang seem to be changing. Those who believe that reviving the nuclear option is a bad choice for Taiwan (because it is highly risky and the costs outweighs the gains) generally reconcile to have a more balanced view on Chang (i.e., there were other technical and non-technical limitations to Taiwan’s nuclear project, and what Chang did may have averted a disaster for Taiwan). For example, without delivery systems, Taiwan’s nuclear weapons could not be used to inflict harm on China. While Taiwan was developing a nuclear bomb during the 1980s, there was a joint program to develop a delivery vehicle. Dubbed Tien Ma (Sky Horse), the surface-to-surface missile was supposed to carry a larger payload than the Tien Kung (Sky Bow), which had a 300kg payload. With the demise of the nuclear program (Hsin Chu Project), the Tien Ma missile program also died. Others argue that in Taiwan’s democratic and open society today, it is highly unlikely a serious undertaking such as developing nuclear weapons can proceed secretly without public

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36 Albright and Gay, “Taiwan.”
38 Wendell Minnick, “Taiwan Has No Tien Ma Ballistic Missiles,” Jane’s Missiles and Rockets (1 October 2002); interviews with Dr. H; and with Dr. Arthur Ding, Institute of International Relations, Taipei, Taiwan, 23 December 2005.
knowledge or media scrutiny. In the words of one prominent analyst, if Taiwan seeks to redevelop nuclear weapons today, it is hard to prevent a second “Chang Hsien-yi incident” from happening.\(^{39}\)

The Chang Hsien-yi incident threw the future of INER into disarray. The agency faced a major confidence and identity crisis. Many researchers, who worked diligently and patriotically, suddenly lost their \textit{raison d'être}. Although the U.S. took decisive measures to ensure the end of Taiwan’s nuclear weapons program, it did not ask (or allow) the INER to disband. There are different explanations for the U.S.’s mixed motivations. One consideration is to view these researchers with concern, so having them at one place facilitates monitor and control and prevents “proliferation” of nuclear manpower.\(^{40}\) Another view is that the U.S. wanted Taiwan to maintain some kind of “near-nuclear capability” by virtue of these researchers’ expertise. Professor Chien Chung of NTHU opined that the U.S. wanted Taiwan to “keep the machine warm and await further instructions” (\textit{nuanji daiming}). He estimated that there are still over 800 “national treasures” today. Chung asked:

\begin{quote}
It would have been quite easy to totally dissolve Taiwan’s nuclear manpower; just give all these people U.S. passports! This is one reason why although it is difficult to obtain the material, Taiwan’s capability to research and develop nuclear weapons can never be completely ruled
\end{quote}

\(^{39}\) Dr. Cheng-yi Lin, Research Fellow, Academia Sinica, and a former National Security Advisor to President Chen Shui-bian, interview by the author, Taipei, Taiwan, 16 December 2005.

\(^{40}\) Interview with Arthur Ding, 23 December 2005.
Some of the original INER researchers are still working at INER, albeit on new, and less controversial lines of research, but more have moved on to other careers, retired, or even died. How easy it is to reconstitute the talent if a political decision should be made is a matter of debate. With the passage of time and a new social milieu, Taiwan’s nuclear arms expertise has undoubtedly deteriorated but is still considerable. With well-developed high-technology industries, experience with nuclear industries, and high human capital, Taiwan does possess the physical and human infrastructure conducive to the development of nuclear weapons – for some of the same reasons why Japan is considered a “virtual nuclear proliferant.”

The key is U.S. interests and attitudes. On the one hand, the robust approach (including the willingness to use force unilaterally) with which the Bush Administration has dealt with the nuclear challenges posed by North Korea, Iran, and Iraq would lead us to think that the U.S. would not tolerate Taiwan’s redevelopment of nuclear weapons. On the other hand, if changing national interests due to geopolitical shifts (e.g., if the U.S. openly sees China as the main threat) dictate that the U.S. selects a reliable nuclear partner or proxy with sufficient technological capabilities and compatible national interests, then Taiwan is as safe a choice as any. Chien Chung reasoned that “If the U.S. decides to give us (what we want) Taiwan is one of the few American allies whom the U.S. can entrust.

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41 Interview with Chien Chung, 20 December 2005.
42 For example, Dr. H now owns a small computer company.
given our R&D capability and economic development.”

The third lesson learned from the history of Taiwan’s nuclear program is that Taiwan’s excessive dependence on the U.S. security commitment gave the U.S. excessive leverage over Taiwan’s nuclear aspirations. The same logic worked in how the U.S. successfully defused the nuclear aspirations of several other allies, such as Japan and South Korea.

Taiwan’s dependence on the U.S. is arguably more acute than Japan’s and South Korea’s, because Taiwan is no longer under explicit treaty protection of the U.S. and any U.S. support of Taiwan has to take into account China’s possible reaction. This gives the U.S. unusually large leverage over Taiwan’s nuclear aspirations. For the foreseeable future, the U.S. can manage Taiwan’s nuclear programs by its mixed strategy of preventing proliferation, maintaining near-nuclear capabilities, and sharing the fruits of peaceful use of nuclear energy.

**Current Status of Taiwan’s Nuclear Programs**

Since the permanent halt of Taiwan’s nuclear weapons program in 1988, there has been arguably a *normative* transformation in Taiwan’s nuclear research. Overall, Taiwan’s 1988 commitment to the U.S. went beyond those obligations mandated by the NPT.

The AEC, the nation’s highest nuclear energy regulatory agency, conforms to IAEA code and

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43 Interview with Chien Chung.


45 Mitchell, “Taiwan’s Hsin Chu Program,” 301.
guidance, even though Taiwan is not a member of IAEA.\textsuperscript{46}

A nuclear taboo has become deeply entrenched.  No aspiring military officer or scientist seeks to advance their career through involvement in nuclear weapons research. Public discourse also decidedly shows no interest in this subject.

Today, Taiwan’s nuclear programs are ostensibly all for peaceful use. Since 1988, Taiwan’s policy regarding weapons of mass destruction (WMD) has evolved into a consistent “five noes” policy: “Taiwan will never manufacture, develop, acquire, stockpile, or employ WMD of nuclear, chemical, and biological warfare agents, warheads, or any forms of weapons.” The official statement appeared in each issue of National Defense Report, the English white paper published every second year by the Ministry of Defense.\textsuperscript{47} This categorical statement is intended to dispel any doubt.

Furthermore, since it came to power, the current ruling party, DPP, has endeavored to implement its stated policy of promoting a nuclear-free homeland. The Nuclear-Free Homeland bill, approved by the Cabinet on 7 May 2003, called for Taiwan to show the world and its children that it had the resolve to build a home that is free from the intimidation of nuclear weapons and the health hazard of radioactive waster by striving toward six goals: (1) no development of nuclear weapons, (2) a gradual

\textsuperscript{46} Dr. Wei-li Chen, “Overview of Civil Nuclear Situation in Taiwan,” PowerPoint presentation (Atomic Energy Council, 1 November 2005).
end of nuclear power, provided energy sources are secure, (3) adjustment
of energy policy, (4) development of clean and renewable energy, (5)
safeguarding of radiation safety, and (6) selection of permanent
depository for radioactive waste. However, this anti-nuclear bill still has
not yet been passed in the Legislative Yuan to which the DPP is minority.
Nevertheless, the DPP believes its anti-nuclear policy is consistent with
worldwide trends.⁴⁸

The ideational change is also reflected in the changing attitudes of
today's youth toward nuclear industries. Whereas Nuclear Physics used
to attract young and bright students with a lucrative career and patriotism,
today Taiwan's students, out of very pragmatic considerations, regard
Computer Science, Electric Engineering, or Biotechnology with higher
esteem. NTHU, the "cradle" of Taiwan's nuclear science, has
reorganized in light of the new zeitgeist. NTHU's College of Nuclear
Science consists of Departments of Engineering and System Science (ESS)
and Nuclear Science. The former was previously called Nuclear
Engineering, and the latter just changed its name (and presumably mission)
to Biomedical Engineering and Environmental Science (BEES) as of 1
July 2006.⁴⁹ ESS's current nuclear programs include nano-materials,
electronics & plasma engineering, micro-electro-mechanical system,
nuclear engineering & radiology, energy engineering, and plasma science
& engineering. The BEES will focus on health and medical physics,
molecular medical physics and biophotonics, environmental molecular

⁴⁸ Interview with Dr. Min-sheng Ouyang, Minister of AEC.
⁴⁹ Information from the two institutes' websites:
http://www.ess.nthu.edu.tw/%7Ecollege/index_eng.html and
science, and physics, chemistry, and biology interdisciplinary undergraduate program.\textsuperscript{50}

Even INER, home of the aborted nuclear program, is redirecting its research activities. As of 2003, INER employed 1,076 people, including 40% researchers, 44% technicians, 9% administrative personnel, and 7% maintenance workers (Institute of Nuclear Energy Report 2004: 6-7). As of July 2005, the annual budget for INER was $87.5 million, broken down for the three technology centers: environmental and energy technology (EETC) (56%), radiation application technology (RATC) (24%), and nuclear safety technology (NSTC) (20%).\textsuperscript{51} NSTC was engaged in radiation detection & protection, and nuclear safety & regulation technology. EETC focused on advanced energy, environmental protection, nuclear facilities decommission, and radioactive waste management. RATC approached biomedical application by isotopes and radiation technology.\textsuperscript{52}

In sum, Taiwan’s current nuclear programs appear solely for peaceful purposes. The current ruling party maintains a fundamentally anti-nuclear policy. With respect to the security implications of this seemingly conclusive renunciation of nuclear weapons, Taiwan seems to rely on America’s tacit security commitment, the international norm against nuclear weapons states’ using nuclear arms against non-nuclear weapons states, and maintaining the technological infrastructure of a

\textsuperscript{50} Chen, “Overview.”
\textsuperscript{51} Taun-ran Yeh, “Review of Current Major Activities at INER,” PowerPoint presentation (INER, November 2005).
\textsuperscript{52} Institute of Nuclear Energy Research (INER), 2003 Annual Report Institute of Nuclear Energy Research (Longtan., 2004), 6.
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thriving civilian nuclear program as a "virtual proliferant"—a nation that could quickly restart its nuclear program if it decided to do so. The decision is mainly political; but it is also technological. It is driven by a normative shift, but also instrumental considerations.

On the Brink of the Rubicon? Imperatives and Options

Should Taiwan cross the nuclear "tipping point" to formally incorporate a nuclear capability in its national security planning? Before that question can be answered, considerations should be given to whether Taiwan can develop nuclear weapons (under certain circumstances), if it decides to? As I argued earlier, both capabilities and intentions are important to this calculus. But broader issues, such as global nonproliferation regime, prevailing technologies, regional security environment, threat perception, U.S. security and foreign policy, relationship with the U.S., and robustness of U.S. security commitment, in turn, influence the assessment on capabilities and intentions.

In terms of feasibility, analysts disagree. Some believe that if Taiwan changed its mind and decided to develop nuclear weapons, it could do so quickly, perhaps within a year or two.53 Having the infrastructure for nuclear research (INER and NTHU) and experience with nuclear power generation, the world’s 17th largest economy, and 3rd largest foreign exchange reserves,54 Taiwan appears to, prima facie, possess the human and financial capital needed for a resumption of

53 Mitchell, "Taiwan’s Hsin Chu Program," 301.
54 According to the CIA World Factbook, Taiwan’s Gross Domestic Product (in purchasing power parity) in 2005 was estimated at $611.5 billion and its foreign exchange reserves as of 2005 were at $225.8 billion. Information available online at http://www.odci.gov/cia/publications/factbook/rankorder/2001rank.html and http://www.odci.gov/cia/publications/factbook/rankorder/2188rank.html.
nuclear program.

Others are more skeptical. Some analysts point out the high cost to restart the program ($10 billion), the predictable resistance by the party holding legislative majority (the so-called Pan-Blue, which held up the government’s proposed budgets for the purchase of the arms package approved for sale by President George W. Bush in 2001 for three years from 2004-7), the tight monitor and control by the U.S. and the IAEA,\textsuperscript{55} and the inability to find suitable locations on the island to conduct nuclear tests,\textsuperscript{56} among others, as reasons why the nuclear option is not quite feasible.

On the desirability issue, analysts are also divided, although few are willing to openly advocate the development of nuclear weapons. Sometimes it is not entirely clear these unorthodox comments reflected simply bravado or hinted at some secret programs. Officials who made this sort of remarks invariably retracted their comments, presumably because of the unwanted attention or misinterpretation their comments had attracted. For instance, former President Lee Teng-hui, in his reply to a question in the National Assembly on 28 July 1995 on Taiwan's nuclear intentions, said: “Whether or not we need the protection of nuclear weapons, we should re-study the question from a long-term point of view.” This prompted Reuters to run a story saying that Taiwan meant to reconsider the use of nuclear weapons, which prompted Taiwan’s Foreign Minister Fredrick Chien to issue a categorical denial.

\textsuperscript{55} Dr. Chong-pin Lin, former Deputy Defense Minister, interview by the author, Taipei, Taiwan, 16 December 2005.
\textsuperscript{56} Interview with Arthur Ding.
that Taiwan had any intention of developing nuclear weapons, blaming the reporters for misunderstanding and misinterpreting a Chinese phrase the President had used. 57 Regardless, such comments kept alive ambiguities over Taiwan’s nuclear capabilities.

A vocal minority has always stressed Taiwan’s need to have nuclear weapons to deter China from attacking the island. A researcher affiliated with the Taiwan Research Institute, which is closely related to former President Lee Teng-hui, argues that Taiwan cannot rely on China’s pledge of “no use” of nuclear weapons against Taiwan 58 and should instead develop a counter-value nuclear deterrent against possible Chinese use of nuclear arms against Taiwan. 59 An editorial in the English-language *Taipei Times* in 2004 argues that “the ability to obliterate China’s 10 largest cities and the Three Gorges Dam would be a powerful deterrent to China’s adventurism.” 60 To rally support for the arms procurement, on 25 September 2004, former Premier Yu Shyi-kun said that Taiwan should

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58 In the aftermath of former Taiwan President Lee Teng-hui’s “special state-to-state relations” remarks, a Chinese Foreign Ministry Spokesman, Sun Yuxi, when asked if China would use nuclear weapons against Taiwan, extended China’s No-First Use principle to Taiwan: “We will not be the first to use nuclear weapons and will not use nuclear weapons against non-nuclear weapons countries and regions, let alone against our Taiwan compatriots.” See “China Says It Will Not Use Nuclear Weapons Against Taiwan,” *New York Times* (3 September 1999): A3. Yet, Sha Zukang, China’s former chief arms control negotiator, touched off a storm by claiming that China’s commitment to a “no-first-use” of nuclear weapons against any state does not extend to Taiwan, because “Taiwan as a province of China, not a state so the policy of no-first-use does not apply.” See “N-weapons Use Does Not Apply to Taiwan,” *Strait Times* (6 August 1996): 3.
rely on a Cold War-style "balance of terror" to safeguard national security in the face of intimidation from Beijing.  

Eschewing such bravado, an International Relations scholar believes that Taiwan should forego the production and development of nuclear weapons to avoid the predictable intense international scrutiny and pressure, but keep mum about acquiring nuclear weapons. He was hinting at the international black markets as the fastest way for Taiwan to acquire nuclear weapons. But Chung disagrees: "Without testing, the quality of acquired weapons cannot be assured, and the numbers so acquired will be insufficient to constitute a deterrent, but Taiwan’s reputation will surely suffer." Andrew Yang of the Council on Advanced Policy Studies (CAPS), a top think tank on security issues, thinks that nuclear weapons are actually a liability for Taiwan’s security, because they further complicate Taiwan’s security challenge.

This is an example of security interaction: Taiwan’s development of nuclear weapons for self-defense will be seen as offensive by China, which had averred that this would constitute one of the Beijing-defined conditions for using force against Taiwan. So there are good instrumental reasons for Taiwan to adopt a non-nuclear policy.

In an article disputing Premier Yu’s “balance of terror” call, Professor

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62 Interview with an International Relations scholar, Taipei, Taiwan, 16 December 2005.

63 Interview with Chien Chung.

64 Interview with Andrew Yang, Secretary-General, CAPS, 21 December 2005, Taipei, Taiwan.
Chien Chung of NTHU concludes that developing WMDs for the sake of engaging in a “balance of terror” with the adversary is not indispensable to Taiwan’s national strategy, nor will it enhance Taiwan’s national security.65

Government officials think that there cannot be any ambiguity in Taiwan’s nuclear policy and one hundred percent transparency is the best option.66

To summarize Taiwan’s rationales for contemplating the “nuclear option”: Taiwan may cross the nuclear Rubicon if it believes that the military imbalance across the Taiwan Strait has become so huge and the prospect for Beijing to use forceful ways to unify Taiwan has become so real that only nuclear weapons can serve as a quick “equalizer” and preserve Taiwan’s independence or as a last-ditch effort to draw the superpowers into the conflict.67

Table 3 shows that China has all classes of WMDs and their delivery systems, but Taiwan only has short-range ballistic missiles carrying conventional warheads. Table 4 shows the rapid increase in China’s defense spending since 1990, powered by the huge expansion of China’s economy. Whereas China’s booming economy has allowed it to post double-digit gains in defense expenditure in each of the past fifteen years,

Taiwan’s defense expenditure has declined in both absolute and relative terms, as the government now spends more on social welfare. As Pentagon’s recent annual reports on China’s military power indicate, China has devoted substantial resources into weapon systems that can be used in asymmetric war to present a “credible” option” to intimidate or actually attack Taiwan and to deny possible U.S. intervention. Under this scenario, a desperate Taiwan may find nuclear weapons attractive to restore some semblance of balance.

(Tables 3 and 4 about here)

Many analysts worry that the military balance is quickly shifting to Beijing’s favor. Since Taiwan can not be expected to engage in an expensive arms race with China (see Table 4), David Shambaugh argues that it is “only a matter of time” that Taiwan will lose the military advantage in the Taiwan Strait. Additionally, the advent of the so-called “Second Nuclear Age” in East Asia, with many states in the region on the heels of their successful economic development now developing missiles and other WMDs, Taiwan may feel that developing nuclear weapons is necessary just to preserve its previous relative security status. The situation is compounded by the fact that Asia lacks NATO-style multilateral regional security institutions to mitigate the security dilemma among various

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68 Military Power or the People’s Republic of China 2006.
69 Shambaugh, “A Matter of Taiwan.”
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states, and the fact that China has insisted that Taiwan be excluded from all regional security institutions (such as the Regional Forum of the Association of Southeast Asian Nations (ARF), despite the fact that conflict in the Taiwan Strait will seriously affect many states in the region.

To sum up the factors that influence Taiwan’s decision to develop nuclear weapons from the standpoints of feasibility and desirability, Table 5 summarizes the “enabling” and “inhibiting” factors.

(Table 5 about here)

Table 5 shows that while there are quite a number of enabling factors that favor Taiwan’s development of nuclear weapons both from the standpoints of desirability (demand-side explanations) and feasibility (supply-side explanations), the overall cost seems to outweigh the benefit, suggesting that a “virtual” nuclear capability is a more plausible option than an explicit project. As long as the U.S. implicit nuclear umbrella is seen as credible, Taiwan’s nuclear option can remain virtual. The only imaginable scenario for Taiwan to cross the nuclear Rubicon is when the following three conditions are present simultaneously: (1) There are serious problems with the credibility of America’s tacit nuclear umbrella; (2) The U.S. is perceived ready to abandon Taiwan in the face of Chinese assertiveness; and (3) The cross-Strait military balance has become so lopsided in favor of China that only nuclear weapons can restore some (semblance of) balance. Naturally, these are extraordinary conditions

under which the unthinkable can happen.

Taiwan, of course, can theoretically take any of the following routes, rather than going nuclear, to shore up its security: (1) negotiating with the PRC – the only state that threatens Taiwan’s survival – to establish some type of confidence-building measures, and (2) joining regional or global institutions to involve the international community to “socialize” the risk posed to Taiwan’s security. But (1) is fraught with many problems. At the very least, it will require Taiwan to abjure the pursuit of de jure independence for 30 to 50 years in return for Beijing’s promise not to use force against Taiwan,72 which the DPP was unwilling to accept. Others justifiably doubt Beijing’s trustworthiness. And at any rate, confidence-building measures will result from, rather than give rise to, a long period of fostering mutual trust. Given the deep mistrust between the two sides, depending on China for Taiwan’s security will require a leap of faith that is currently not supported by evidence.

(2) is similarly impractical. Beijing’s isolation of Taiwan – through mandating all states and international organizations to respect its “one China” principle – means that few countries or organizations are willing to take up the issue of Taiwan’s security for fearing of antagonizing China. In fact, Beijing’s refusal to permit Taiwan more “international space” contributes to Taiwan’s alienation from and mistrust of China.

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72 This “double renunciation” formula forms the basis of Kenneth Lieberthal’s “interim agreement” proposal. See his “Preventing a War Over Taiwan.” Foreign Affairs 84(2)(March-April 2005): 53-59. Lieberthal advocated this concept before and after his stint in the Clinton Administration’s National Security Council.
This leaves only the U.S. (and possibly in partnership with Japan) as Taiwan’s possible counterweight vis-à-vis China. After the end of the Cold War, in the aftermath of the counter-terrorism war and China’s rise, the U.S. has strengthened its military posture in East Asia, while adhering to the global posture review in light of the new security challenges.\textsuperscript{73} In February 2005, the foreign and defense ministers of the U.S. and Japan (the Security Consultation Talk, or “2+2” talks) declared that “the peaceful resolution of issues concerning the Taiwan Strait through dialogue” as a “common strategic objective” of the enhanced alliance.\textsuperscript{74} This highly symbolic act signifies the increasing desire for the U.S. and Japan to coordinate their military actions in a Taiwan contingency as well as “preventive diplomacy,” but it does not change the fundamental U.S. policy of “strategic ambiguity.” Therefore, as long as Taiwan feels reasonably assured by U.S. security commitment, albeit implicit and not unconditional, it prefers to forego the costly nuclear option and invests elsewhere. Conversely, if the U.S. fundamental policy of “maintaining the status quo” (essentially a non-unification policy) should change to one of favoring unification or \textit{de jure} independence, Taiwan may seek nuclear weapons. In the pro-unification scenario, Taiwan may think that it has been abandoned by the U.S. and that only nuclear weapons can help Taiwan resist China’s incorporation and preserve Taiwan’s \textit{de facto} independence. In the pro-independence scenario, Taiwan may seek nuclear weapons, on its own or with U.S. assistance, to resist the anticipated Chinese military attack.


\textsuperscript{74} The text of the joint declaration is available from the State Department’s website http://www.state.gov/r/pa/prs/ps/2005/42490.htm [accessed 19 February 2005].
It should be noted there is one other scenario that could see Taiwan possessing nuclear weapons. Some analysts, such as Ted Galen Carpenter, view the current U.S. policy of "strategic ambiguity" untenable, because it will lead to a war between two nuclear powers – the U.S. and China – over Taiwan. Carpenter especially calls for the U.S. to categorically renounce any security commitment toward Taiwan in return for selling Taiwan any weapons the Taiwanese want (presumably nuclear weapons included) and holding them responsible if they provoke China.

The impact of Taiwan’s becoming nuclear on regional security is expected to be largely negative. China previously declared that developing nuclear weapons is one of the causes for using force against Taiwan. Due to the double stimulation provided by the "demonstration effect" of America’s abandonment of Taiwan and the militarily more belligerent China, Japan may renounce its decades-old pacifist policy and reconsider the nuclear option.

In sum, a "perfect storm" caused by increasing Chinese military threat, deteriorating regional security, and abandonment by the U.S. may force Taiwan to cross the nuclear Rubicon.

If Taiwan should seriously consider the nuclear option, what role will nuclear weapons play in the nation’s security and force posture?

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75 Ted Galen Carpenter, America’s Coming War with China: A Collision Course Over Taiwan (New York: Palgrave, 2005).
76 Over the years, depending on the changing situation in the Taiwan Strait, China has altered the conditions under which it might use force against Taiwan, despite its professed policy of “peaceful reunification.” The most recent such conditions are included in the 2000 White Paper on the Taiwan issue and the 2005 Anti-Secession Law.
Will Taiwan Contemplate a "Nuclear Option"?

Nuclear Option and National Security Strategy

My research, which is based on open sources, has failed to find any good discussion on the role of nuclear weapons plays in Taiwan’s national security strategy. This is due to two reasons. First, the Taiwanese society is deeply divided over the issue of national identity, which is closely related to the public’s preference over the final relationship between China and Taiwan. This division, unfortunately, also contributes to divergent views on the sporadic debate over nuclear weapons. At the risk of oversimplification, there exists a high degree of, albeit imperfect, correlation between national identity and attitudes toward nuclear weapons. Analysts who are more closely associated with the Pan Blue (KMT, People First Party, and New Party) are more likely to (1) consider themselves as “Chinese” or “both Chinese and Taiwanese,” (2) acknowledge that Taiwan is at least culturally and historically part of China, (3) expect that the people-to-people exchange and economic integration across the Taiwan Strait may gradually reduce the mistrust and tension between the two sides and eventually bring about reconciliation, and (4) therefore oppose the nuclear option on the ground that it is unnecessary (to be used against “compatriots”) or even dangerous.

The DPP’s official stance is anti-nuclear. However, I have also found that those few Taiwan analysts who are in favor of the nuclear option are invariably associated with the Pan Green (DPP and the Taiwan Solidarity Union). They are more likely to: (1) consider themselves as “Taiwanese only,” or “both Taiwanese and Chinese,” but never “Chinese,” (2) see Taiwan and China as two separate countries, (3) view China as a hostile external enemy which is getting more and more menacing, and (4) therefore favor developing nuclear weapons as deterrent against Chinese
aggression. Under this schism involving primordial identities, well-informed and rational discussions are very difficult to emerge.

Second, because Taiwan is not a major power (yet can be characterized as a middle power that is dependent upon a powerful superpower), well-informed discussions on national strategy, military strategy, and national security are rare. Furthermore, since the government has never publicly discussed nuclear policy and has staked out a categorical nuclear renunciation policy, there has not been a discourse on the role of nuclear weapons on national security.

Nevertheless, we can make some educated guesses based on the government’s stated policy and idiosyncratic scholarly and journalistic sources.

The most lofty aspirations of Taiwan’s national security policy can be found in the ROC Constitution. Article 137 states that “the objectives of the ROC’s national defense are the safeguarding of national security and the preservation of world peace.” Article 1 of the ROC National Defense Act states: “The goal of the ROC’s national defense is to protect national security and safeguard world peace through display of national strength as a whole and building of a national defense military force.”77 These fundamental and enduring objectives and aspirations should form the nation’s highest strategy – national strategy, according to scholar Chien Chung. In contrast, strategies at lower levels, such as military strategies, tactics, political, economic, psychological strategies can adjust according

77 Taiwan Yearbook 2004, 101.
to the changing circumstances and evolving national needs.\textsuperscript{78}

For example, Taiwan’s military white paper states that “the current military strategy of the ROC military is based on ‘effective deterrence, resolute defense’ (有效嚇阻、防衛固守)” and “the basic goals of our current defense policy are ‘preventing war, homeland security, and counterterrorism’ (預防戰爭、國土防衛、反恐制變).”\textsuperscript{79}

In this context, the nuclear option will serve mainly as a\textit{ deterrent}, albeit a dubious one. The DPP hardliners prefer the Cold War-style deterrence, which would require 3Cs: capability, credibility, and communication. In other words, successful execution of this type of deterrence would require that Taiwan actually has a sizable nuclear arsenal, has tested it or used it, and indicates that it is willing to use it again (thus closer to possessing a minimal deterrence capability?). That is to say, it hopes to dissuade an adversary from doing something by clearly demonstrating both real\textit{ capability} and\textit{ intention}. These requirements are perhaps far-fetched for Taiwan in terms of both capability and the international reaction to Taiwan’s possible intention. Instead, Chung thinks a more ambiguous strategy inspired by Sun Tzu, which combines both real (實) and empty (虛), is the best.\textsuperscript{80}

It should be noted that some Chinese-language media report that Taiwan’s Ministry of Defense was building the country’s first-ever

\textsuperscript{78} Chung, “Perspectives on Strategy.”
\textsuperscript{79} 2004 National Defense Report, 56.
"strategic force," which is expected to have small-scale fighting capability in 2007.81 This capability is pivoted on Taiwan’s improved missiles which now have a range of 600-1,000 km – enough to reach such Chinese cities as Shanghai, with the aim of further improving the range to 2,000 km – as far as Beijing.

Taiwan’s recent progress in missile technology – a possible delivery vehicle -- is a significant technological accomplishment for Taiwan’s military. However, if these improved missiles can only carry conventional warheads, they are unlikely to deter a China that is willing to use nuclear weapons against Taiwan, although China will have to pay a very high political price for such blatant deviation from its no-first-use policy. Therefore, such accomplishments also rekindle speculation on the status of Taiwan’s strategic (including nuclear) capabilities.

Under current security situation in East Asia, Taiwan has to walk a very tight rope on its security strategy: It must do everything possible to maintain America’s political and military support. It must not give China any excuse for unprovoked attack. If it decides to develop a nuclear capability, it must do it in the most discrete circumstances. Under these conditions, Taiwan’s “nuclear option” will always exist in the virtual world.

Will Taiwan Contemplate a “Nuclear Option”?

Table 1: Timeline of Taiwan’s Nuclear Program During the Cold War

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1956</td>
<td>Taiwan opened its first nuclear reactor, given by the U.S., at NTHU.</td>
</tr>
<tr>
<td>1964</td>
<td>China successfully tested nuclear weapons, stimulating Taiwan to develop a full-scale nuclear program.</td>
</tr>
<tr>
<td>1965</td>
<td>The predecessor of the military-run Chungshan Institute of Science and Technology (CSIST) was established. The proposed First Institute would become the Institute for Nuclear Energy Research (INER).</td>
</tr>
<tr>
<td>1967</td>
<td>The $140 million “Hsin Chu” project was launched, consisting of primarily procuring and operating a heavy-water reactor, a heavy-water production plant, a reprocessing research lab, and a plutonium separation plant.</td>
</tr>
<tr>
<td>1968</td>
<td>ROC joined the Non-Proliferation Treaty (NPT). Supervision of INER was moved to AEC</td>
</tr>
<tr>
<td>1969</td>
<td>INER purchased a small heavy-water reactor (40-megawatt), dubbed Taiwan Research Reactor (TRR), from Canada, which became operational in 1973. INER served mainly to facilitate Taiwan’s procurement of elements to produce plutonium.</td>
</tr>
<tr>
<td>1971</td>
<td>IAEA negotiation of safeguard agreement short-circuited by UN’s transfer of recognition. Eventually, agreement reached so the US became the ultimate legal guarantor of Taiwan’s non-nuclear status.</td>
</tr>
<tr>
<td>1974</td>
<td>CIA concluded that Taiwan was working toward a nuclear weapons capability and would be capable of producing a nuclear weapon within five years.</td>
</tr>
<tr>
<td>1976</td>
<td>Premier Chiang Ching-kuo promised Taiwan would not acquire its own reprocessing facilities or engage in any activities related to reprocessing.</td>
</tr>
<tr>
<td>1977</td>
<td>U.S. pressured Taiwan to dismantle reprocessing facilities and return US-supplied plutonium. Brought under control, but concerns remained.</td>
</tr>
</tbody>
</table>
President Jimmy Carter normalized relations with the PRC. Taipower's first nuclear reactor began producing electricity. Over the years, electricity generated by Taipower's six reactors, all U.S.-made, rose to 20% of Taiwan's electricity needs. The fourth nuclear plant, with two more modern reactors, is scheduled to operate in 2006-7.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>President Jimmy Carter normalized relations with the PRC. Taipower's first nuclear reactor began producing electricity. Over the years, electricity generated by Taipower's six reactors, all U.S.-made, rose to 20% of Taiwan's electricity needs. The fourth nuclear plant, with two more modern reactors, is scheduled to operate in 2006-7.</td>
</tr>
<tr>
<td>1987</td>
<td>INER began building a multiple hot cell facility.</td>
</tr>
<tr>
<td>1988</td>
<td>Col. Chang Hsien-yi, Deputy Director of INER and a CIA spy, defected and revealed Taiwan's plans. CIA estimated Taiwan was within one or two years of developing a nuclear bomb. President Chiang Ching-kuo died. U.S. government agencies and IAEA inspectors shut down TRR and the hot cell. President Lee Teng-hui promised President Ronald Reagan Taiwan would agree to end conclusively and verifiably its nuclear weapons program.</td>
</tr>
</tbody>
</table>

Sources: See Note 6. Author’s compilation.
Table 2: Taiwan’s Nuclear Power Plants

<table>
<thead>
<tr>
<th>Nuclear power plant and location</th>
<th>Net output (MWe)</th>
<th>Supplier of nuclear reactor</th>
<th>Year and month of commercial operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Nuclear Power Plant (Shimen, Taipei County)</td>
<td>604</td>
<td>G.E. (U.S.)</td>
<td>12/1978</td>
</tr>
<tr>
<td>2nd Nuclear Power Plant (Wanli, Taipei County)</td>
<td>948</td>
<td>G.E. (U.S.)</td>
<td>12/1981</td>
</tr>
<tr>
<td>3rd Nuclear Power Plant (Hengchun, Pingtung County)</td>
<td>890</td>
<td>Westinghouse (U.S.)</td>
<td>07/1984</td>
</tr>
<tr>
<td></td>
<td>890</td>
<td>Westinghouse (U.S.)</td>
<td>05/1985</td>
</tr>
<tr>
<td>4th Nuclear Power Plant (Gongliao, Taipei County)</td>
<td>1350</td>
<td>G.E. (U.S.)</td>
<td>07/2006*</td>
</tr>
<tr>
<td></td>
<td>1350</td>
<td>G.E. (U.S.)</td>
<td>07/2007*</td>
</tr>
</tbody>
</table>

Note: * Projected. Construction of the 4th nuclear plant started in 1998 but was halted in October 2000, after the DPP, which espoused an eventual nuclear-free homeland, came to power. Thanks to a constitutional interpretation rendered by the Grand Justices and weeks of inter-party negotiations, the project was resumed in February 2001.

Table 3: Status of Weapons of Mass Destruction, China vs. Taiwan, 2004

<table>
<thead>
<tr>
<th>Indicator</th>
<th>China</th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear weapons status</td>
<td>Confirmed</td>
<td>None</td>
</tr>
<tr>
<td>Chemical weapons status</td>
<td>Probable</td>
<td>Suspected</td>
</tr>
<tr>
<td>Biological weapons status</td>
<td>Suspected</td>
<td>Suspected</td>
</tr>
<tr>
<td>Short-range ballistic missile status</td>
<td>Confirmed&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Confirmed&lt;sup&gt;g&lt;/sup&gt;</td>
</tr>
<tr>
<td>Medium-range ballistic missile status</td>
<td>Confirmed&lt;sup&gt;b&lt;/sup&gt;</td>
<td>None</td>
</tr>
<tr>
<td>Intermediate-range ballistic missile status</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Submarine-launched ballistic missile status</td>
<td>Confirmed&lt;sup&gt;c&lt;/sup&gt;</td>
<td>None</td>
</tr>
<tr>
<td>Intercontinental ballistic missile status</td>
<td>Confirmed&lt;sup&gt;d&lt;/sup&gt;</td>
<td>None</td>
</tr>
<tr>
<td>Strategic bomber status</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Strategic submarine status</td>
<td>Confirmed&lt;sup&gt;e&lt;/sup&gt;</td>
<td>None</td>
</tr>
<tr>
<td>WMD commitments</td>
<td>BTWC, CWC, NPT&lt;sup&gt;f&lt;/sup&gt;</td>
<td>NPT&lt;sup&gt;h&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Notes:

<sup>a</sup> CSS-6 (DF-15/M9), CSS-7 (DF-11/M-11), CSS-8 (DF-7). Over 650 DF-11 (M-11) and DF-15 (M-9) are deployed opposite Taiwan.

<sup>b</sup> CSS-2 (DF-3), CSS-5 (DF-21). Several dozens that can reach Japan, India, and Russia.

<sup>c</sup> CSS-N-3 (J-1)

<sup>d</sup> 30+: 24 CSS-4 (DF-5A), 8 CSS-9 (DF-31), CSS-3 (DF-4). Two dozen or so can reach the U.S. and Europe

<sup>e</sup> 1


<sup>g</sup> Ching Feng, Tien Chi

<sup>h</sup> The ROC ratified the NPT in 1970. The 1971 UN Resolution 2758, which paved the way for ROC’s expulsion from the UN, deprives ROC’s right to sign multilateral treaties, such as CWC and BTWC, but ROC government has stated that it will abide by both treaties nevertheless. In addition, it has stated that it will
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continue to abide by the NPT.

Sources: Author’s compilation of National Bureau of Asian Research (NBR) Research Team findings, 2004, obtained through Strategic Asia data query service, available at (http://strategicasia.nbr.org/Data/DataSheet/Criteria.aspx) and Nuclear Threat Initiative (NTI) country pages on China (http://nti.org/e_research/profiles/China/print/index_5506.prt) and Taiwan (http://nti.org/e_research/profiles/Taiwan/print/index.prt); Wikipedia entry on “Taiwan and weapons of mass destruction,” http://en.wikipedia.org/wiki/Taiwan_and_weapons_of_mass_destruction.

Table 4: Defense Spending and Economy, China vs. Taiwan

<table>
<thead>
<tr>
<th>Select Years</th>
<th>China</th>
<th></th>
<th>Taiwan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>413</td>
<td>11.3</td>
<td>3.1</td>
</tr>
<tr>
<td>1995</td>
<td>3,500</td>
<td>33.0</td>
<td>5.9</td>
</tr>
<tr>
<td>2000</td>
<td>4,500</td>
<td>42.0</td>
<td>3.9</td>
</tr>
<tr>
<td>2005</td>
<td>8,182</td>
<td>81.5</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Table 5: To Do Or Not to Do? – Factors Influencing Taiwan’s Nuclear Decision

<table>
<thead>
<tr>
<th>Enabling factors</th>
<th>Desirability (demand-side)</th>
<th>Feasibility (supply-side)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• to offset acute power</td>
<td>• Military nuclear technical expertise can be reconstituted?</td>
</tr>
<tr>
<td></td>
<td>asymmetry between China and Taiwan (quick “equalizer”)</td>
<td>• Civilian nuclear technical expertise</td>
</tr>
<tr>
<td></td>
<td>• to ensure survival (existential deterrence)</td>
<td>• Progress made in missile technology</td>
</tr>
<tr>
<td></td>
<td>• last-ditch effort after being abandoned by the patron state</td>
<td></td>
</tr>
</tbody>
</table>

| Inhibiting factors | | |
|-------------------|---------------------------|
|                  | • Opposition from the patron state (even a pretext for abandonment?) |
|                  | • Difficulty in material acquisition |
|                  | • Lack of test sites |
|                  | • Secrecy can’t be assured |
|                  | • PRC’s possible preemptive strike |