Sparking a Buildup: U.S. Missile Defense and China's Nuclear Arsenal

Charles Ferguson

"A wise man adapts himself to circumstances, as water shapes itself to the vessel that contains it."
—Chinese proverb

Currently, China is exploring how to modernize its aging nuclear forces as it simultaneously finds itself adapting to the circumstances presented by the U.S. development of advanced theater missile defense for East Asia and national missile defense for the United States. The concurrence of these two events could lead to China shaping a significantly larger nuclear force that could strike the United States unless Washington decides that missile defense deployment is not in its best interest and China continues to adhere to a minimum deterrent posture consistent with its currently small arsenal.

More than simply finding ways to preserve China's nuclear deterrent, the vociferous Chinese opposition to U.S. missile defense plans symbolizes the more significant strategic clash over the roles of the United States and China in the world. Just at the time when China is starting to develop economic and military muscle and is successfully emerging from a century of foreign domination and humiliation, which stretched from the mid-19th century to the mid-20th, it is increasingly alarmed about the United States as a global hegemon that is growing without bounds.

Chinese President Jiang Zemin articulated the strategic clash between China and the United States in a speech commemorating the Chinese who died as a result of the May 1999 U.S. bombing of the Chinese embassy in Kosovo. "Relying on its economic, scientific, technological, and military prowess, the United States continues to practice hegemony and power politics and wantonly interferes in the internal affairs of other countries. What it has done has heightened the vigilance of more and more countries and people," he said.<1>

Making explicit the perceived connection between missile defense and the United States' encroachment on China's sovereignty, General Zhang Wannian, vice chairman of China's Central Military Commission, stated, "Any country selling the theater missile defense system to China's Taiwan or incorporating Taiwan in the theater missile defense program will directly or indirectly put Taiwan in the framework of Japan-U.S. security cooperation, which will be a grave infringement in China's internal affairs." He made this statement at a June 9, 1999, meeting with Marshal Sergeyev, Russia's minister of defense, who "expressed satisfaction with the development of friendly cooperation between the two armed forces [of China and Russia]," according to Zhang. He added that "Russia is resolutely opposed to the U.S. attempt for world hegemony."<2>

From the U.S. government's perspective, its "leadership has never been more needed, or more in demand. And so it is perplexing that the United States finds itself today being accused of both
hegemony and isolationism at the same time," according to Samuel Berger, assistant to the president for national security affairs.<sup>3</sup> In the same speech, he elaborated, "Among our many friends and allies around the world, the dominant vision of the United States still is one of a country whose leadership is essential to peace and prosperity and which exercises leadership for the greater good." Concerning China, he called for balance, asserting that "we should not look at China through rose-colored glasses; neither should we see it through a glass darkly, distorting its strength and ignoring its complexities."

To follow Berger's advice on China, each side needs to understand the other's security concerns. The coincident timing between China's nuclear force modernization and the United States' missile defense development presents a critical moment for the United States and China to attempt to reach a strategic understanding. It is not clear whether or not the United States will decide to deploy a national missile defense, but U.S. intentions toward China seem ambiguous at best, and hostile at worst. China is modernizing its nuclear forces, and there are several courses of action that it could take to defeat a U.S. national missile defense (NMD)—options Washington should be aware of before making its decision. To avert nuclear escalation, both sides must enter a sustained exchange of views on their intentions about missile defense and force modernization, in particular, and their roles in the world, in general. This dialogue should culminate in actions that reduce the risk of either planned or accidental nuclear conflict.

**America's Unclear Intentions**

In trying to determine if U.S. missile defense is designed for China, Chinese leaders hear two distinct political voices. The Republicans forcefully announce that missile defense is intended for China, but the Clinton administration takes a more ambiguous position. While the administration has clearly stated that the United States needs an NMD system to defend against so-called "rogue" nations, such as North Korea, Iran and Iraq, and to shoot down a handful of missiles from an accidental launch, it has not explicitly mentioned China as one of the driving forces behind NMD. Despite this ambiguity, current U.S. NMD plans appear sized for the small Chinese ICBM force.

The Clinton administration has spent considerably more effort courting Russia on accepting U.S. missile defense than it has openly put forth addressing Chinese concerns. For example, in discussing the Anti-Ballistic Missile (ABM) Treaty in November 1999, Secretary of State Madeleine Albright said, "The limited changes [to the treaty] we are contemplating would not undermine Russian security," but she failed to explicitly discuss the impact on Chinese security.<sup>4</sup> Although this approach might be expected because the United States and Russia are the parties to the treaty and because Russia has a far larger nuclear arsenal, it only serves to further obfuscate U.S. intentions.

Defense Secretary William Cohen has also carefully avoided any explicit reference to China in U.S. national missile defense designs. For instance, during a talk in January 1999 in which he outlined the missile threat, he never once mentioned China. Following that speech, he also dodged the issue of China when a questioner asked, "Secretary [of Defense Robert] McNamara made a very similar speech 32 years ago that you just went through, except he named China as the rogue nation.... What are your hopes and fears in that line?" Cohen replied, "What we're dealing with here is the question of those nations—rogue nations could be North Korea, it could be others—who acquire a limited capability that could in fact pose a threat to the American people. We intend to develop, a system that would give us that limited type of protection against either the rogue nation or the accidental, unauthorized type of launch."<sup>5</sup>

Following a January meeting at the Pentagon with Lieutenant General Xiong Guangkai from the Chinese Ministry of Defense, Walter Slocombe, undersecretary of defense for policy, was asked if the administration tried to "convince [the Chinese] that NMD is not designed to take away their nuclear deterrent." He replied, "It's not for us to convince them of that proposition." He later added, "I have said in the past that we believe that our system is designed with respect to rogue states. That is the concern. It is not aimed at China or Russia or any other country, other than the rogue states."<sup>6</sup>

Though the United States has been less than forthcoming in its rhetoric, it has at last begun to engage China in a dialogue about NMD. In February, Deputy Secretary of State Strobe Talbott led a
high-level delegation to Beijing to explain U.S. national missile defense plans and U.S. views of the emerging missile threat.

Of course, for President Clinton, NMD has another purpose: to shield his chosen successor from charges of being soft on defense. As John Pike, a scholar at the Federation of American Scientists who is opposed to missile defense, has observed, "The president's deployment decision will have more to do with defending Al Gore against George Bush than the American people against North Korea." Indeed, in assessing U.S. intentions and planning its nuclear force modernization, China has to determine not only what the meaning behind the Clinton administration's vagueness means, but also the likely direction of U.S. policy when a new president takes office in less than a year. Chinese leaders need to ascertain if the United States' China policy and missile defense plans will change soon.

Vice President Gore will probably continue the Clinton administration's policy on missile defense if he becomes the president. In a December debate in New Hampshire, Gore expressed the guarded view that "some kinds of missile defense" would be permissible given the current state of U.S. relations with Taiwan and the mainland. When asked by a reporter to be more specific, Gore demurred. He coined a new term "constructive ambiguity" as the hallmark of the United States' success in dealing with China. Despite the studied ambiguity, Gore and his foreign policy team have clearly expressed that they do not want to spark an arms race over missile defense to Taiwan. In contrast, they have been less clear on the impact of national missile defense on China's deterrent vis-à-vis the United States.

Unlike Gore, Bill Bradley has apparently been forging his foreign policy views without as much external input. He was roundly criticized following a town meeting on foreign policy at Tufts University on November 29, 1999. Notably, he spoke little about missile defense or China. However, of all the presidential candidates, Bradley expresses the most caution over the consequences that missile defense could have on arms control and strategic stability.

In contrast to Gore's ambiguity and Bradley's caution, Governor George W. Bush and Senator John McCain, the two leading Republican presidential contenders, are not reticent about their support for deploying missile defense and directing it at China. Both have pledged to deploy national missile defense even if it means abrogating the ABM Treaty.

In a recent foreign policy interview, McCain discussed his policy on national and theater missile defense. He said, "What we need is to build modest systems and improve on them. For example, I'd like to see us develop a sea-based system that we could station off Taiwan, if necessary, in international waters." He was then asked if that would provoke China. In response, he said, "We would only do that in case the Chinese were acting aggressively toward Taiwan, which would be a violation of the one China policy, which they are committed to, because the one China policy calls for the peaceful reunification of China." McCain believes in addressing China with unabashed realism. He has characterized Chinese leaders as "determined, indeed ruthless, defenders of their regime, who will do whatever is necessary, no matter how inhumane or offensive to us, to pursue their own interest."

Unlike McCain, Bush has not served in Congress and lacks McCain's depth of experience in foreign policy. Nonetheless, Bush has built foreign policy muscle by enlisting a formidable team of advisers on whom he is apt to rely heavily. Concerning China, they appear divided. In particular, Condoleezza Rice, a key adviser in the Bush administration's National Security Council, takes a realist stance and remarks that "China has its own interests. It's a great power in the traditional sense. You need a broadly based policy, try to encourage economic liberalization, compete where you must on security issues." However, Paul Wolfowitz and Richard Perle, two other Bush advisers, see China in a more hostile light. Significantly, in July 1999, they signed a Heritage Foundation document that called for the United States "to deter any form of Chinese intimidation of the Republic of China on Taiwan and declare unambiguously that it will come to Taiwan's defense in the event of an attack or a blockade against Taiwan, including against the offshore islands of Matsu and Kinmen [Quemoy]." Notwithstanding their somewhat different stances on China, all the advisers support missile defense.

In a November interview with The New York Times, Bush spelled out his views on missile defense
deployment and transfer of missile defense to Taiwan. Concerning deployment, he said, "I think we ought to give Russia a reasonable period of time...if not, we ought to abrogate the ABM Treaty." He specified that a reasonable period is "months," not years. In response to a question concerning whether or not he has decided about selling missile defense to Taiwan, he replied, "You mean, when we deploy the Aegis cruiser system, for example, will we sell the technology to Taiwan? Depends on how the Chinese behave." Trying to split the difference between menacing and coddling China, he said, "[China] will be unthreatened, but not unchecked."

China's Perspective: Back to the Future

After the bombing of Kosovo, Chinese leaders are worrying where the United States' humanitarian and democratic missions—backed by military power—will venture next. In 1997, China regained Hong Kong, and last December it reacquired Macau. Chinese leaders have clearly stated that Taiwan is next in line for reunification. However, U.S. military aid to Taiwan serves to stymie those plans. While the U.S. government supports the one China policy, thereby not advocating Taiwanese independence, the United States is required to equip Taiwan with weapons for its self-defense, in accordance with the 1979 Taiwan Relations Act and the three communiqués. Recently, a majority in the House of Representatives voted to increase military aid and ties through the Taiwan Security Enhancement Act, which the Clinton administration has threatened to veto.

Taiwan has expressed strong interest in receiving advanced theater missile defense (TMD) from the United States. Although the United States has sold the Patriot Advanced Capability-2, a limited TMD system, to Taiwan, it has not decided whether to provide more advanced TMD, if such systems are developed. In March 1999, during a meeting with Chinese Foreign Minister Tang Jiaxuan, Secretary of State Albright reportedly stated that "there would be less need for [TMD] if China stopped pointing its missiles so aggressively at Taiwan or were more helpful in restraining North Korea." These remarks were tempered when she explained that "a decision...has not been made to deploy defensive technologies that do not yet exist." On November 12, 1999, State Department spokesman James Rubin said that Washington does "not preclude the possible sale of TMD items to Taiwan in the future." However, the United States does not support Taiwan's development of long-range ground-to-ground ballistic missiles.

China considers Taiwan a renegade province. Although China is unlikely to invade Taiwan in the near future, it has not relinquished the option of using military force against Taiwan. Regarding missile defense for Taiwan, China is adamantly opposed and concerned that it will embolden Taiwan's leaders to declare independence. Taiwan's desire for U.S. missile defenses from the United States represents only one of the outstanding elements of the U.S.-Chinese-Taiwanese missile diplomacy triangle. During this past year, reports have surfaced that China has deployed as many as several hundred short-range ballistic missiles opposite Taiwan. Although some Chinese officials have openly denied that China is targeting Taiwan with missiles, the Chinese missile firings just north and south of Taiwan prior to the 1996 Taiwanese presidential election removed any doubt that China would use missiles to try to influence Taiwan's behavior. In response, the United States demonstrated resolve by positioning two aircraft carrier battle groups near Taiwan.

To Chinese leaders, potential enhanced military ties between the United States and Taiwan flashes back to the time of the 1954 Taiwan Strait Crisis and the events preceding it. The Korean War ended in 1953 with the Korean Peninsula divided between the North, backed by China, and the South, supported by the United States. Although the United States and allied forces lost tens of thousands of troops, China suffered even greater losses, with perhaps up to 1 million soldiers having died.

During the Korean War, China felt coerced by the United States' threat of nuclear attack. This nuclear blackmail contributed to China's fears of U.S. containment that were further inflamed by events over Taiwan. Soon after the Korean War, the United States moved to bring Taiwan into a mutual defense pact. Fueling China's concerns over encroachment of its sovereignty, in late 1953 and early 1954, Taiwanese warships hijacked some merchant ships belonging to or headed for China. In summer 1954, the United States sent two aircraft carrier battle groups into the East China Sea. Closely following these events, on September 3, 1954, China began an artillery bombardment of the offshore island of Quemoy, which was claimed by Taiwan. These and other increased tensions...
led to the signing of the mutual defense pact between Taiwan and the United States on December 2, 1954.

On January 15, 1955, China committed itself to building nuclear weapons to prevent further nuclear blackmail and to try to counter the United States' containment strategy. During that time period, Chairman Mao Zedong characterized the atomic bomb and U.S. imperialism as "paper tigers." Recently, Ambassador Sha Zukang, China's top arms control official, borrowed the term when referring to China's perception of missile defense. "Once you have got the [missile] shield, others will develop a spear strong enough to penetrate it.... Using Mao's words, it's a paper tiger—fierce enough to frighten away cowards only," he said.<17>

This past history demonstrates that when China has experienced nuclear threats and containment, it has reacted by developing nuclear weapons, thereby undermining U.S. security. In a reminiscent manner, China's current perceptions of infringements on its sovereignty through deployment of a U.S. NMD system and possible fortified military ties between the United States and Taiwan, including advanced TMD, could lead to a strengthening of China's missile force and nuclear arsenal. Such a reaction would also undercut U.S. security.

**China's Potential Response to NMD: More Missiles, More Warheads**

If the United States erects an NMD system, how many more ICBMs and warheads capable of striking the continental United States would China want to deploy?

Despite the fact that China is a developing country, it has the financial wherewithal to build as many missiles and warheads as it believes are necessary to oppose projected NMD plans. For instance, one Chinese analyst has estimated that China would have to spend less than one-tenth of what the United States would spend in order to maintain parity between Chinese missiles and U.S. missile interceptors. Building 200 ICBMs would cost about $2 billion. This expenditure could be spread over several years and would represent less than 2 percent of China's current foreign currency reserve.<18>

Chinese military planners would probably decide on the number of warheads and missiles to build based on worst-case assumptions about the effectiveness of the U.S. NMD system. Although the Ballistic Missile Defense Organization (BMDO) is not planning on achieving 100 percent effectiveness for its missile interceptors, Chinese planners may start with the assumption that each interceptor could be this effective.

They would then have to consider BMDO's firing doctrines. BMDO's canonical doctrine of two-on-one, shoot-look-shoot means that for every incoming warhead two interceptors will be initially launched, followed by two additional interceptors if the first two miss.<19> This doctrine implies deploying four interceptors for every expected warhead. However, if the Chinese military anticipates the first volley working essentially perfectly, China would choose to build at least two warheads for every four interceptors.

Under more rigorous testing than has yet transpired, BMDO may determine that it cannot adhere to an effective shoot-look-shoot firing doctrine because this tactic is too technically demanding. Instead, BMDO could rely on a barrage firing doctrine in which a volley of four interceptors would be launched for each warhead.

In the ultimate worst-case scenario, Chinese military planners would assign 100 percent effectiveness to each interceptor and assume that BMDO would rely on a single shot firing doctrine of one interceptor per warhead.

**Table 1** lists the number of additional Chinese warheads on ICBMs that would be built based on the above firing doctrines and worst-case assumptions. It assumes that China believes that the two dozen ICBM warheads in its current arsenal are sufficient for China's nuclear deterrent without
missile defense. However, China may be planning on building more ICBM warheads regardless of missle defense. In either case, more transparency about China's intentions for its future arsenal is needed.

Could the latest generation of Chinese ICBMs carry these additional warheads in a multiple-warhead mode? The United States and the Soviet Union developed multiple independently targetable re-entry vehicles (MIRVs) for their missiles as a means of overwhelming anticipated missile defenses. But MIRVs are not the only method to ensure penetration of defenses. Other feasible options include building more missiles with single warheads, in addition to deploying decoys and other countermeasures on missiles. However, MIRVs could be a less expensive method compared to deploying more missiles.

If deployed in sufficient quantities, MIRVs can provide the capability to destroy a significant portion of an enemy's missile force, thereby limiting damage from second or follow-on strikes. The Chinese would not pursue MIRVs for this reason because they have too few warheads for counterforce strikes against the United States or Russia. Both the U.S. and Russian strategic arsenals are more than 15 times the size of the total Chinese force. Further, China lacks the fissile material to build enough warheads to countenance a counterforce strategy, according to best estimates.

China's new mobile missiles, once fully developed, will strengthen the survivability of China's nuclear force because they will be harder to target than the older silo- and cave-based missiles. But the newer solid-fueled missiles have significantly smaller throw-weights (payloads) than the previous generation of liquid-fueled missiles—a fact that could severely limit China's ability to MIRV these missiles.

While the May 1999 Cox Report and its proponents have trumpeted China's MIRVing capability, other intelligence community reports and analysts have raised doubts about whether China has the ability or the motivation to MIRV its missiles. The 1998 National Air Intelligence Center's Ballistic and Cruise Missile Threat report states that China's DF-31 and DF-41 ICBMs will not be MIRVed. Moreover, the U.S. National Intelligence Estimate released in September 1999 notes that deployment of MIRVs on "a future mobile missile would be many years off."

To help set bounds on the possible number of multiple warheads that the Chinese missiles might carry, Table 2 lists the relevant characteristics of U.S. ICBMs. Using Table 2's data and assumptions, Table 3 shows the maximum number of warheads that each Chinese solid-fueled missile might hold.

For a relatively heavy warhead, such as the W88, China would only be able to place two or three MIRVs on its latest missiles. In contrast, it would increase the MIRVing capacity by a factor of two to four by opting for a lighter warhead, such as the W68. The trade-off for more MIRVs involves a decrease in yield. Some U.S. defense analysts have argued that because smaller-yield warheads must be more accurate, China might not be able to MIRV. On the contrary, accuracy should not be a major impediment as long as China subscribes to a countervalue doctrine of aiming warheads at cities. For example, a W68-type warhead that explodes even hundreds of meters away from the center of a populous city will probably kill hundreds of thousands of people.

However, this discussion should not be construed as advocating MIRVs on Chinese missiles. From an opponent's perspective, as the number of MIRVs increases per missile, the missile's value as a target also increases. From China's perspective, fewer or no MIRVs would enhance the survivability of its missile force.

Citing a further reason why China may not want to MIRV, physicist Richard Garwin has written, "MIRVs are not the optimal weapons if China anticipates encountering a U.S. national missile defense (NMD) system.... Instead, China is far more likely to use effective countermeasures (such as light-weight decoy balloons) rather than multiple RVs on its future missiles." Although such countermeasures would provide a significant penetration capability of a limited NMD system, Chinese military and political leaders may decide that these measures are not adequate by themselves and that more missiles with more warheads might signal greater Chinese strength, thereby serving as a more effective political weapon. Nonetheless, several reports indicate that China has been testing decoys and other countermeasures on its latest generation missiles. Further,
expanded military ties between Russia and China could lead to China's purchase of missile defense penetration aids from Russia.

**Nuclear Risk Reduction Needed**

If the United States deploys a limited NMD system, it will, in effect, eviscerate China's currently small deterrent. This action will pressure China to engage in an nuclear arms buildup. Although such an increase could be gradual, based on the pace of China's past nuclear force modernization programs, it is threatening nonetheless: the end result would be a significantly larger Chinese nuclear force able to strike the continental United States.

To mitigate these increased nuclear dangers, the United States and China should implement risk-reduction measures. While such steps cannot resolve the security dilemma posed by missile defense, they will enhance the security of both nations, even if the United States chooses not to deploy an NMD system.<25>

During the Cold War, Russia and the United States developed several agreements to reduce the risk of nuclear war between them. These agreements included confidence-building measures to increase communications, prevent incidents at sea and in the air, and prevent missile test-firings from sparking an inadvertent war. China and the United States should seriously consider implementing similar agreements.

While China and the United States have taken tentative steps toward some of these agreements, they have not done enough to construct more meaningful accords and enhance existing ones. Current agreements include the January 1998 Military Maritime Consultative Agreement, the May 1998 Hotline Agreement and the June 1998 Nuclear Weapons De-Targeting Agreement.

The first agreement established a consultative mechanism "to promote safe maritime practices and establish mutual trust [such] as search and rescue, communications procedures when ships encounter each other, interpretation of the Rules of the Nautical Road and avoidance of accidents at sea." While this agreement is an encouraging first step, it is lackluster in comparison to the detailed 1972 Incidents at Sea (INCSEA) agreement between the former Soviet Union and the United States.<26> Importantly, the original INCSEA agreement stipulated that each side should refrain from "simulating attacks" against the other. In the Taiwan Strait flashpoint, these restraints would lessen the risk of misconstruing the other side's intentions.

The second agreement provided for a direct communications link between the heads of government. Presidents Jiang and Clinton first tested it as part of Clinton's visit to China in June 1998. Building on this agreement, both sides could construct nuclear risk reduction centers in both China and the United States that would enhance diplomatic communication channels during times of crisis. These centers would facilitate other crisis reduction data exchanges.

The third agreement specifies that both sides agree to not target each other's nuclear forces. However, it is largely a symbolic gesture in that China reportedly maintains its nuclear weapons capable of striking the United States in a low-alert condition with warheads reportedly off the missiles and China has repeatedly declared a no-first-use policy.

A more meaningful confidence-building measure would be a de-alerted U.S. nuclear force.<27> Many arms control scholars have championed taking U.S. and Russian nuclear weapons off hair-trigger alert to lessen the likelihood of accidental nuclear war. In the context of the U.S.-Chinese nuclear relationship, a de-alerted U.S. nuclear force could reduce Chinese fears of a first strike that could decimate China's retaliatory force and a U.S. missile defense system that could shoot down whatever remained. A de-alerted force that provides a mutually assured survivable deterrent and ensures that any re-alerting would be detected with sufficient advanced warning would give China adequate confidence that the United States does not intend to direct a first strike at it. Nevertheless, China should take steps to secure the survivability of its deterrent because a de-alerted U.S. force would not be sufficient to guarantee the viability of China's deterrent.
In addition, China and the United States should enact predictability measures that would achieve greater transparency between their militaries, such as annually exchanging data about force levels and plans. Such measures would build upon the resumption of high-level military-to-military contacts, as exemplified by the January talks at the Pentagon with Lieutenant General Xiong Guangkai, the deputy chief of the People's Liberation Army's general staff.

While the United States and China are presently headed toward a strategic collision over missile defense, they still have time to avert a wreck. The next few years represent a critical period. China will be deciding the size and composition of its nuclear arsenal, taking into account U.S. missile defense plans. In parallel, the United States will be evaluating whether or not the criteria of missile threats, impact on arms control, technological readiness, and financial costs dictate missile defense deployment.

To help reduce the perceived need for these defenses, as one of North Korea's few friends, China can exert whatever influence it has on North Korea to curb that nation's missile program. Moreover, China can continue to make clear the adverse effect of missile defense on arms control and reductions. In the United States, the near-term policy on China and missile defense depends strongly on which political party will control the next presidency. The policy choice now appears to be either acrimony or ambiguity. However, the United States cannot afford to be acrimonious or ambiguous when it comes to its intentions concerning China and missile defense. Either option could lead to more Chinese nuclear warheads able to strike the United States.

NOTES

The author would like to thank several colleagues, especially Li Bin and John Pike, for their helpful comments on earlier drafts of this article.


[Back to Text]


[Back to Text]


[Back to Text]


[Back to Text]


[Back to Text]


[Back to Text]


18. Private communication with Dr. Shen Dingli, deputy director of the Center for American Studies at Fudan University, Shanghai, China.

19. For a more detailed discussion of missile defense effectiveness, read Dean Wilkening, "A Simple


21. Although the Poseidon submarine launched ballistic missile was tested with 14 MIRVs, the average deployed number of MIRVs was 10. With 14 MIRVs, the Poseidon essentially had little footprint crossrange. In other words, it could not cover spread out targets and thus had no real MIRVing capability. See: Graham Spinardi, *From Polaris to Trident: The Development of the U.S. Fleet Ballistic Missile Technology*, Cambridge University Press, 1994, pp. 106-107.

22. According to the Cox Report, China stole design information for the W88. This allegation has not been proven. Moreover, China claims that its weapons scientists are capable of producing these type of warheads without any help from espionage.


25. These ideas are based on discussions with John Pike and a presentation, titled "Russian-American Risk Reduction with Chinese Characteristics" by the author given at the Eleventh International Summer Symposium on Science and World Affairs in Shanghai, China on July 30, 1999.


Charles Ferguson, a physicist, directs the Nuclear Policy Project at the Federation of American Scientists. [Back to top]