PREVENTIVE DEFENSE PROJECT

A RESEARCH COLLABORATION OF STANFORD & HARVARD UNIVERSITIES
WILLIAM J. PERRY & ASHTON B. CARTER, CO-DIRECTORS

August 29, 2005

Dear Colleague:

I co-chair Senator Richard Lugar's Policy Advisory Group (PAG) to the Senate Foreign Relations Committee. Senator Lugar asked the PAG to advise him on how the United States can lead in plugging a loophole in the Nuclear Non-Proliferation Treaty (NPT). The NPT has been interpreted as permitting non-nuclear weapons states to operate facilities (for enriching uranium and reprocessing plutonium) that can be used to make bomb material, provided only that they don't take the final – and much too short – step to build bombs. Iran and North Korea are now trying to exploit this loophole.

The PAG produced the attached report to Senator Lugar and the Foreign Relations Committee. Senator Lugar, in turn, conveyed the report to President Bush, urging the President to follow up on his February, 2004 speech proclaiming the U.S. government's determination to plug the NPT loophole.

I hope that through Lugar's catalyzing leadership, and the PAG's analysis, this important initiative to stem nuclear terrorism and proliferation gains new energy in Washington.

The members of the PAG are:
Ashton B. Carter, co-chair
Ronald Lehman II, co-chair
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All the best,

Ashton B. Carter
Co-Director, Preventive Defense Project

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July 19, 2005

The Honorable George W. Bush
President of the United States
The White House
1600 Pennsylvania Ave., NW
Washington, DC 20500

Dear Mr. President,

I share with you a great concern about the future of the Nuclear Non-Proliferation Treaty and the larger non-proliferation system it supports. Attached is an interim report I have received from the Policy Advisory Group (PAG), a panel of experts I convened to provide advice to me and the Senate Foreign Relations Committee on what Congress and the administration should do to strengthen the NPT system. The group has had a number of meetings, and their deliberations continue. However, they have already reached conclusions about one crucial aspect of the issue that I felt I should share with you now.

The existing safeguards regime used by the International Atomic Energy Agency (IAEA) succeeded in forestalling nuclear weapons programs in the world's advanced industrial states, several of which were weighing the nuclear option 40 years ago. This regime has failed to keep pace, however, with the increase in the global availability of nuclear weapons technology, especially the technology and equipment for uranium enrichment and spent nuclear reactor fuel reprocessing to produce the fissile material for such weapons. Now the road to nuclear weapons can be traveled by determined countries with only a minimal industrial base. While the number of recognized nuclear-weapon states (NWS) has not dramatically increased over the years, the dangers of proliferation have become all too apparent as demonstrated by the A.Q. Khan network, and the Iranian, North Korean, and Libyan examples.

The PAG believes, and I concur, that the construction of new facilities for the enrichment of uranium and reprocessing of spent nuclear reactor fuel, even for ostensibly peaceful purposes, poses an unacceptable long-term risk to the national security of the United States. You pointed to this same risk in your February 11, 2004, speech at National Defense University. The enrichment technology intended to produce fuel for nuclear power reactors can also be used to create material for a nuclear weapon, and the plutonium that is produced from reprocessing spent fuel is also suitable for nuclear weapons and susceptible to diversion to terrorists. The spread of enrichment and reprocessing capabilities will dangerously increase the chances that more nations will develop their own nuclear weapons and that terrorists might obtain fissile or radiological materials for a crude or even highly destructive nuclear bomb. It is therefore incumbent upon the

United States to lead an international effort to halt the expansion of enrichment and reprocessing to new countries.

The PAG found that the use of nuclear power is likely to increase, both in developed countries and, in particular, in developing countries. Importantly, however, the experts of the PAG concluded that expansion of nuclear power does not require—either technically or economically—the construction of enrichment or reprocessing facilities in countries that do not currently have them. "Under most scenarios," the PAG found, "excess capacity already exists and will continue to exist for many years."

Therefore, I believe the United States should adopt as a basic non-proliferation principle that countries which forego their own enrichment and reprocessing programs have guaranteed access to nuclear reactor fuel at reasonable prices. I encourage your administration to begin to implement this policy immediately by seeking international concurrence on new arrangements to control enrichment and reprocessing technology, a Proliferation Safeguards Initiative, or PSI-II. Such efforts would also aim to continue to strengthen, in terms of technology, funding, and policy, the existing international nuclear safeguards regime. Taking as a model your successful Proliferation Security Initiative, PSI-II should be a U.S.-led coalition of willing states, assembled without the cumbersome and time-consuming negotiation of new international agreements.

Based on my own experience and the discussions of the PAG, I would recommend several criteria to guide the creation and operation of this effort.

1. It should seek to buttress, not undermine, the NPT and the Nuclear Suppliers Group.

2. It should be accompanied by a significant increase in funding for the Safeguards Division of the International Atomic Energy Agency to improve its ability to meet its inspection and verification responsibilities. The IAEA is under-funded to perform its current tasks and would be required to do much more should nuclear energy become more widespread globally. The current staffing and budget of the IAEA cannot sustain further stress, nor can the world afford to allow another state to develop nuclear weapons in secret.

3. Non-nuclear weapon states which agree to accept fuel services and leasing of fuel, in return for giving up reprocessing and enrichment facilities, must consent to wide access and close monitoring of their nuclear energy activities, exceeding the requirements of the IAEA Additional Protocol. This would include activities, locations, and information not directly related to nuclear material itself, but that could be associated with nuclear weapons development.

4. Countries wishing to initiate or expand a nuclear power program should be required to demonstrate an economic need for such nuclear power capacity before they are granted access to nuclear fuel services. The United States should develop criteria to evaluate such need.

5. The United States should explore means for disposing and storing of spent nuclear fuel from those countries which agree to accept a closed fuel cycle and forego a reprocessing capability. No such repository for spent fuel now exists for use in an international closed fuel cycle plan. Past discussions in this area have suggested that Russia would be a candidate for such a repository.

6. The administration should take great care as it implements the Next Steps Strategic Partnership with India's nuclear power sector to which you have just agreed. We must provide clear and credible warnings to current non-nuclear weapon states party to the NPT that they will not be able to gain similar arrangements should they leave the treaty.

Mr. President, I look forward to working closely with you to prevent the proliferation of these dangerous technologies. The future peace and security of our nation and the world is at stake. The inherent dual-use nature of the nuclear fuel cycle, combined with its wide availability in civilian nuclear power, uniquely challenges the world to find ways to stop diversion of such technologies to military uses while ensuring that no state uses the cover of nuclear power to develop nuclear weapons. A decade ago, I took action with those in Congress who were ready to meet the threat of proliferation posed by the collapse of the Soviet Union. Today, we must work together to ensure that the global nonproliferation regime does not collapse through inaction.

Sincerely

Richard G. Lugar
Chairman

July 1, 2005

MEMORANDUM TO: Senator Richard G. Lugar
Chairman, Senate Committee on Foreign Relations

FROM: Policy Advisory Group on Nonproliferation

SUBJECT: Interim Report on Nuclear Threat Reduction and the Fuel Cycle

Mr. Chairman:

With the Review Conference on the Nuclear Nonproliferation Treaty (NPT) behind us, the Senate Foreign Relations Committee, under your leadership, is looking to the long-term future of the NPT System. The Policy Advisory Group (PAG) has started its work in making recommendations for American leadership to update and improve the workings of the NPT and related nonproliferation efforts over the long term.

While the PAG has only begun its deliberations, it has already arrived at some observations with respect to one key issue: how the nuclear nonproliferation system of the future should treat the proliferation of uranium enrichment and plutonium reprocessing.

President Bush addressed the danger posed by the spread of fuel-cycle capabilities to more countries in his February 11, 2004 speech at National Defense University. The PAG supports the priority the President attached to this issue and urges the U.S. government to take a strong position of international leadership to stop the proliferation of uranium enrichment and plutonium reprocessing facilities and technology. After 9/11, the specter of nuclear terrorism and its close connection to nuclear proliferation must occupy center stage in our national security policy.

An initiative to oppose the proliferation of enrichment and reprocessing capabilities to additional countries can directly reinforce the effort to stop the Iranian nuclear program, since the international understanding it would seek would be fully consistent with the European-led multilateral effort backed by the United States to prevent Iran from completing enrichment facilities. And while influencing North Korea is probably well beyond the reach of any such initiative, both North Korea and Iran would not have realized their nuclear ambitions nor continue their respective progress in the fuel cycle unchallenged if elements the system recommended here had been in place. Indeed, the 1991 North-South Denuclearization Agreement prohibited reprocessing and enrichment in both North and South Korea. Had it been implemented successfully, we might have an entirely different situation in the two Koreas today. Hindsight on the Iranian and North Korean crises therefore suggests the foresight necessary to prevent future situations like these from developing. The PAG believes that without such a system in place, the future world could contain many states engaged in enrichment and reprocessing, some of which would inevitably pose the threat of nuclear attack and the spread to terrorists of such knowledge, technology and materials as possessed today by Iran and North Korea.

The PAG has made these key observations in its deliberations:

1. THE DANGERS AND PROMISE OF NUCLEAR POWER

- Proliferation of uranium enrichment and plutonium reprocessing to additional nations is inherently dangerous to U.S. national security because it can lead to both state and non-state nuclear threats:
    - State proliferation: possessing these facilities brings a state close to the point of a nuclear weapons capability.
    - Nuclear terrorism: security failures at any such facility, or during storage and transportation, could provide a source of fissile material (highly enriched uranium, or HEU, and plutonium) for non-state terrorists.

- Preventing this threat is only one component—but a vital one—of a multi-layered defense against nuclear attack. This multi-layered defense ranges across the spectrum of tools at our disposal, from diplomatic to military action, and must address weaponization research and development as well as fissile materials production.

- Much of the expansion of nuclear power is likely to take place in the developing world. This expansion could be desirable on economic and environmental grounds, but it can and must be accomplished in a manner consistent with U.S. national security.

- This expansion in the use of nuclear power will require uranium enrichment capacity that could also produce tens of thousands of nuclear bombs *per year*, and it could produce as a byproduct enough plutonium for tens of thousands of additional nuclear bombs *per year*.

- Expansion of nuclear power does not require proliferation of enrichment or reprocessing—either technically or economically—to countries that do not have it. Under most scenarios, excess capacity already exists and will continue to exist for many in states with functioning nuclear fuel production facilities.

- On the other hand, were acts of nuclear terrorism to occur because of "loose" fissile material, the expansion of nuclear electricity generation would likely be brought to an abrupt halt.

- National security, economics, and environmental protection are therefore all in alignment in recommending that the United States oppose the proliferation of enrichment and reprocessing facilities into new countries and especially into troubled regions. The spread of such technology truly deserves to be spotlighted as a centerpiece of "proliferation."

2. THE FUEL CYCLE AND THE NPT

- A policy of active opposition to the spread, under today's circumstances, of enrichment and reprocessing know-how to countries that do not currently possess such technology, in particular to troubled regions, is consistent with the *principal intent* of the NPT. Indeed, action in this area is essential to strengthening the nonproliferation regime. Moreover, opposition to the proliferation of enrichment and reprocessing is made more urgent by technological, security, economic, and environmental forces, all equally compelling:

    - Technology: On the weapons front, when the NPT was first signed it was beyond the reach of all but developed nation states to master the art of fission bomb design. In the interim, the general progress of

technology and the proliferation of specific know-how in bomb-making by the A.Q. Khan network, have resulted in a situation in which the mere possession of highly enriched uranium or plutonium removes a major obstacle to bomb-making capability for the possessor whether they are a state or non-state actor. Today, on the nuclear power front, the once-through fuel cycle producing and using low-enriched uranium for power generation is the fuel-cycle and plant design of choice. Advanced "proliferation-resistant" reactor designs may be technically and economically feasible in the future; however, interest is growing in some circles for greater use of closed fuel cycles. These factors must be taken into account now, while there is more opportunity to influence the future to ensure that U.S. national security concerns are met.

- Security: Two major events since the signing of the NPT have changed the nature of nuclear security in fundamental ways. First, the collapse of the Soviet Union showed that seemingly stable governments in possession of nuclear capabilities can be replaced by fluid, even chaotic, situations in which nuclear capabilities can fall into dangerous hands. Second, the terrorist attacks of 9/11 should be a clear wake-up call that non-state nuclear use is likely if fissile materials are available to certain terrorist groups that are accessing the know-how.
- Economics: When the NPT was signed the future of nuclear power seemed open-ended: Electricity generated by nuclear power would be "too cheap to meter;" every country's economic future would depend on nuclear power; and importantly, the economics of expanding nuclear power would require many locations where uranium would be enriched and plutonium would be reprocessed. Today experts and industry have a more refined view of the economics of nuclear energy. There is enough enrichment capacity in existing facilities and their planned expansion to fuel all the world's reactors for many years, and at reasonable prices. Reprocessing is not currently economically competitive with once-through fuel cycles, and there is plenty of raw uranium to fuel the once-through cycle long into this century under most scenarios. Today we can assert that stopping the proliferation of enrichment and reprocessing need not slow the spread of nuclear power nor increase its cost.
- Environment: Carbon-free nuclear electricity generation could be an important ingredient in slowing global warming, displacing natural gas, some oil, and especially coal.

- While the United States is therefore entirely justified in a policy of opposition to the proliferation of enrichment and reprocessing, we are not well positioned to promote such a policy internationally and will need the help of other nations:

    - Most countries with enrichment and reprocessing are nuclear weapon states, which introduces political complications arising from claims made by non-nuclear-weapon states regarding Article VI of the NPT.
    - Our position as a nation with an active uranium enrichment industry likewise makes it difficult for us to appear evenhanded in opposing the proliferation of enrichment facilities.
    - Any approach that denies to some what is permitted to others, no matter how valuable, must address the political question of discrimination or fairness.

- Success in opposing the proliferation of enrichment and reprocessing will therefore require adroit and sustained U.S. diplomacy that systematically enlists a growing body of international support.

3. ASSESSING PROPOSALS FOR US POLICY

- The PAG has reviewed a number of specific proposals for stemming the proliferation of enrichment and reprocessing capabilities, including the President's NDU proposals, IAEA Director General El Baradei's, and those of other governments (e.g., France) and recognized experts. All have merits, yet all have drawbacks and their own opponents.

- Many of these proposals overlap in one common feature—that states foregoing their own enrichment or reprocessing facilities will be guaranteed various cradle-to-grave fuel services for their nuclear reactors at reasonable prices and within a strictly controlled and verified transfer system. U.S. policy should therefore focus on this common ground to stand the best chance of succeeding. A number of mechanisms have been suggested to provide guarantees to states that renounce their own capacity to enrich nuclear fuel, and to provide inducements to store or reprocess spent fuel outside of their country. The PAG assesses that a combination of industry contract provisions, national policies, and strengthened safeguards can together provide reasonable assurance of fuel supply to such states.

- We believe that identifying the "best" compromise to bring the necessary players together will require further work and, above all, a vigorous testing of the diplomatic waters.

4. INTERIM PAG RECOMMENDATIONS

- The PAG does, however, make the following recommendations for USG action at this time:
    - The administration should attach a high priority to achieving broad international agreement to a U.S. policy opposing proliferation of enrichment and reprocessing. The priority attached to this mission should be comparable to that devoted by the USG to the Proliferation Security Initiative (PSI), a "Proliferation Safeguards Initiative" or PSI-II.
    - The diplomatic strategy pursued should take PSI as its model –an effort that has been able to garner the support of willing states. An initial "core group" of suppliers and consumers of fuel services should be carefully selected as a starting point.
    - The administration should be prepared to amend the President's February 11, 2004 proposal if further analysis or diplomatic experience suggests that doing so will lead to a greater chance of success.
    - The Administration should work with the Foreign Relations Committee if it finds that amendments to U.S. law are necessary to implement fuel-cycle proposals.
    - The USG should be willing to accept a temporary arrangement (perhaps ten to fifteen years) that might lead over time to a more permanent arrangement.
    - The United States can and should use this fuel-cycle nonproliferation initiative synergistically to promote other national security goals:
        - This initiative could reinforce efforts to encourage responsible practices by states that are not parties to the NPT (e.g., India) and might provide some additional realms for cooperation to prevent further proliferation.
        - The initiative could reinforce the continuing effort to encourage the Russian government to take more active leadership on the security of nuclear materials and to make the Russian nuclear power infrastructure more secure and more in line with today's economic realities. Russia could, for example, downblend more

HEU as a strategic reserve for assured supply, and build a profitable international spent fuel repository.

- The initiative could further remove any veil of economic necessity from the Iranian and (to the extent this claim is made by North Korea) North Korean nuclear programs and further isolate these states diplomatically.
- The initiative would reinforce and augment key counterproliferation efforts such as the newly-globalized Cooperative Threat Reduction program ("Nunn-Lugar"), National Missile Defense, PSI, UNSCR 1540, and the new priority for counterproliferation within DOD's Quadrennial Defense Review by adding fuel cycle restraints to the nation's growing layered defense against nuclear attack and the proliferation of nuclear weapons.
- The initiative would express the willingness of the United States to spearhead multinational initiatives where they serve the interests of U.S. and international security.
- Above all, the initiative would reflect President Bush's determination that his highest priority is to "not permit the world's most dangerous regimes and terrorists to threaten our Nation and our friends and allies with the world's most destructive weapons."

- The President should appoint a senior diplomat with authority and accountability for success in this initiative.
- The Administration should report progress in this endeavor to the Congress, and the Senate Foreign Relations Committee should engage the Administration to further prospects for success. The PAG stands ready to assist the Committee in monitoring and assessing progress.

Mr. Chairman, following the collapse of the Soviet Union you and Senator Nunn and your Senate colleagues saw more clearly than most that the terms of nuclear security had changed fundamentally and that a basic change in the American approach to the nuclear relationship between Moscow and Washington was required. Today in the wake of 9/11, your appointment of this PAG signifies how urgent it is to make equally profound changes in the way nuclear proliferation is countered due to the threat of nuclear terrorism. We appreciate your leadership and are honored to serve. We will continue to deliberate and to make recommendations to the Committee on this and other aspects of updating the NPT and the system of counterproliferation efforts surrounding it.

Sincerely,

Ashton B. Carter, co-chair
Ronald Lehman II, co-chair
Robert Einhorn
Alan A. Foley
Arnold Kanter
David Kay
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