

# F.A.S. PUBLIC INTEREST REPORT

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## DE-MIRVING SUBMARINES CUTS THE NUCLEAR GORDIAN KNOT

Notwithstanding the collapse of the Soviet Union, and the announced new Presidential guidelines, U.S. strategic force posture continues to emphasize time-urgent targeting of the strategic forces and the command and control sites of Russia. This policy, which could be implemented as a first strike or quick second strike (launch on warning) is completely unnecessary in the post-cold war era. It is accident prone in requiring quick judgements of what to do. And it induces the Russian command to set its decaying and accident prone forces to fire on warning (which also means that a U.S. disarming attack would be likely to fail anyway).

Moreover, maintaining a launch on warning/disarming attack option against an alerted Russian force may limit future disarmament to as many as two thousand warheads on missiles and bombers, thought by some to be necessary to maintain the option. And so long as the Defense Department can argue that it is instructed to maintain this option on a *minute-to-minute* basis, de-alerting of warheads would also be limited since de-alerting, by definition, does not leave weapons available at a moment's notice.

### How to Change the Policy?

The United States should resolve all these problems by moving away from an unnecessary, useless and dangerous launch on warning/disarming attack strategy to a policy of secure reliance on a deterrent-only force. But how to organize this decision? Should we look toward a formal Presidential proclamation after a study by a blue-ribbon panel? Or should we seek an informal resolution through a series of de-alerting measures that try to peel away the onion until the warheads on minute-to-minute alert are insufficient to permit the disarming attack option to be carried out without re-alerting?

A third way would have the President instruct the

Defense Department to study a START III proposal to eliminate all sea-based MIRV on both sides and to reduce the overall number of ballistic missile warheads to about 500. Such a proposal would precipitate the needed debate in a context of prospective bilateral disarmament. And the debate would focus on a weapon whose unfortunate characteristics were well-advertised even before then-Congressman Al Gore championed criticisms of MIRV.

### Sea-based MIRV is the Key

START II implementation will eliminate all land-based MIRVs. From every point of view, the most natural, and politically most acceptable, way to eliminate additional large numbers of deployed ballistic missile warheads is to de-MIRV in START III the U.S. and Russian submarine forces by replacing all but one warhead per missile with dummies. This requires no change in naval deployments; for example, the U.S. force of 18 submarines has a total of almost 3500 warheads on its 432 missiles and would be permitted 1750 even under START II. De-MIRVed it would have 432 warheads with about 288 of them on station at sea in non-alert periods. Yet such a force, invulnerable when on station, is at least ten times more than enough to deter Russian attack.

But a sea-based force of this kind—complemented by some land-based Minuteman III missiles within an overall limit of 500 ballistic missile warheads—would not be enough to constitute a realistic threat to a comparably sized Russian force composed of, say, 200 fixed land-based missiles, 200 road-mobile missiles that could be dispersed, 20 airfields to which bombers might disperse, a submarine base or two (hosting about 100 submarine-launched missiles), and dozens of command posts.

Happily the Russians are ready and eager to move toward much lower levels of strategic weapons than we

have already proposed and the force sketched above for them is one to which they could readily move after START II by de-MIRVing their submarines.

Most important, such an offer would help secure Russian ratification of START II itself, by reducing Russian fears of a U.S. first-strike capability. And to the extent that this proposal requires some comparable action from other nuclear powers to limit and de-MIRV their forces, they could and should be included. De-MIRVed, the planned British and French submarines would be an equally secure deterrent for those countries but would carry only 48 and 64 ballistic missile warheads respectively. The Chinese have now approximately 100 ballistic missile warheads on unMIRVed missiles and could be asked to stay below some agreed number.

### Declassification of Documents Needed

To provide public support for the abandonment of a posture which few experts believe is still necessary, the President should declassify documents showing the realities of a President trying to decide, within ten minutes, whether to fire on warning of attack.

Today's nuclear Gordian knot can best be severed by abandoning, through a disarmament proposal, an anachronistic U.S. policy requirement for a launch on warning/disarming attack. To help get the Russians off alert, to help them ratify START II—and to make it possible for our own de-alerting measures to be expanded—we should orchestrate today, within the United States Government, a suitable offer to ban MIRV at sea just as START II banned MIRV on land.

—*Jeremy J. Stone and Paul C. Warnke*  
Reviewed and Approved by the FAS Council  
(For endorsers, see box on page 3)

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## The Dangers of Launch on Warning

From Bruce Blair's *Global Zero Alert for Nuclear Forces*

The finest body of unclassified work on the nuclear war plans appears in the works of Bruce Blair of The Brookings Institution. With permission, FAS has drawn 2,000 words, highly excerpted from his *Global Zero Alert for Nuclear Forces* (Brookings, 1995) and a few boxes from his *The Logic of Accidental Nuclear War* (Brookings, 1993) to document the urgency of proposals like those of our editorial. To be fully appreciated, *Global Zero Alert* should be read in the unexcerpted original.

A breakdown of Russian control has replaced a breakdown of deterrence as the basic problem of nuclear security. In general, high combat readiness severely undermines safety. Operational safety would be improved were the major defense establishments to lower their alert levels and coax the rest of the world to follow suit. In the alternative a remote hypothetical scenario requiring instant action induces alert operations that feed on themselves.

### FAS Proposal Well Endorsed

Of the signatories on page 2, **Stone** is the FAS President and **Warnke** is the former Director of the Arms Control and Disarmament Agency. Their proposal has been reviewed and endorsed by such distinguished and experienced specialists (with relevant former or present identifying titles) as: **Alton Frye**, Senior Vice President of the Council on Foreign Relations; **Steve Fetter**, former Special Assistant to the Secretary of Defense for International Security Policy; **Morton H. Halperin**, former Deputy Assistant Secretary of Defense for International Security Affairs; **Townsend Hoopes**, former Undersecretary of the Air Force; **Carl Kaysen**, former Deputy National Security Adviser to the President; **John E. Pike**, Director, FAS Space Policy Project; **George W. Rathjens**, Secretary General of Pugwash; **Herbert F. York**, former Director of Defense Research and Engineering in DoD and Director of the Lawrence Radiation Laboratory, Livermore.

Recognizing the unstable and transitional character of the Russian political center, the Pentagon has quietly initiated extensive military-to-military contacts to nurture durable cooperation between the U.S. and Russian military establishments. The Pentagon is also spearheading an effort to promote nuclear dismantlement in the former Soviet Union, an endeavor it portrays as an urgent priority of U.S. national security.



Bruce Blair, Brookings Institution

### Worst Case Analysis Dominates

Unfortunately, worst-case scenarios of deliberate Russian attack overshadow the very real specter of nuclear chaos and loss of control. A nuclear posture review of 1994 advanced a nuclear force structure and operational posture for the United States that will only make it more difficult for Russia to control its nuclear forces safely. Among other effects, the review reinforces Russia's reliance on quick launch. The operational safety of Russia's nuclear posture is deteriorating, and no amelioration of this danger will result from U.S. nuclear planning.

### The Specter of Nuclear Anarchy

For strategic nuclear forces, we must consider unauthorized use of nuclear weapons by rebellious commanders in the field; loss of control caused by a political breakdown at the top of the chain of command in Moscow; and the danger of inadvertent release of missiles through, for example, launch on warning based on false evidence—encouraged by the dismembering of the missile attack early warning network

## The U.S. Threat

### Launch on Warning=Preemption=Cornerstone

Rapid reaction or launch on warning is controversial, U.S. officials acknowledged that this option existed as a capability, but they never conceded and often strenuously denied that it had become the cornerstone of U.S. operational plans...Slightly earlier timing than launch on warning amounted to preemption. Launching slightly later amounted to retaliation...Launch on warning's supposed purpose was to gird deterrence with additional uncertainty about the timing of any U.S. response to acts of aggression. This popular view was wrong. Retaliation after ride-out was an abstraction remote from operational predilections. From that standpoint it qualified as one of the great myths of the nuclear age.

## The Russian Problem

Russian military planners, for example, must still worry about the fact that accurate U.S. Trident and Minuteman (and, until START II is fully implemented, MX) missiles could destroy a large fraction of Russian nuclear forces and command-and-control systems with as little as 20 minutes warning of an attack, since only a small portion of the Russian submarine and mobile missiles are on patrol or positioned to survive a first strike. Especially troubling is that Russia, in protecting against the possibility of such a sudden attack, reportedly continues to rely on its capacity to launch ICBMs and pier-side submarine launched ballistic missiles (SLBMs) on warning of a missile attack. According to some reports, the situation is exacerbated by the fragmentation and degradation of Russia's attack warning system. Thus, by deploying relatively large, lethal, and alert forces to deter the increasingly improbable circumstance of a deliberate surprise Russian attack, the United States may prompt Russia to adopt a posture that greatly increases the risk of erroneous or unauthorized launch.

—*The Logic of Accidental Nuclear War*

when the Soviet Union broke up.

Russian ballistic missile submarines do not maintain continuous two-way communications with higher authority, and the general staff cannot continuously monitor their status or electronically override the actions of their crews. About one or two of these boats are being kept on combat patrol at any time.

Meanwhile gravity bombs and cruise missiles for strategic bombers have weak technical safeguards once loaded onto the bombers in some crisis.

Russian nuclear control at the political apex remains susceptible to such lapses of competent civilian leadership as was seen in the coup against Gorbachev and the alleged frequent inebriation of President Yeltsin. This has gone so far that U.S. strategic planners have also surely considered developing options for selectively attacking elements of the Russian nuclear forces that spin out of control.

### Launch on Warning: Basic Russian Plan

Russia's unsafe strategy of launch on warning has been the primary retaliation plan for the land-based strategic rocket forces and ballistic missile submarines on pierside alert. It has even been portrayed by Alexei Arbatov as "the one-sided Soviet strategy which relied exclusively on the launch on warning principle". The totality of evidence since the late 1970s—heavy Soviet investment in launch on warning and so-called dead hand, or automatic retaliation, arrangements, and heavy emphasis on launch on warning in strategic exercises and training—strongly indicates a preoccupation if not obsession with situations in which the West initiates a strategic nuclear attack. They are now striving to shift to launch under attack using the "dead hand", or automatic retaliation system—under this system the launch would occur only after nuclear explosions from enemy attack were detected. But until the shift to launch under attack is confidently established, which is unlikely to happen any time soon, if ever, launch on warning will remain the basic concept and predominant option in Russian strategy.

Under Russian procedures, its early warning reports go to the President, defense minister and chief of the general staff who convene an emergency teleconference over special communications within four to six minutes after liftoff. It would then deliberate for no more than three minutes and then give instructions to launch or withhold a retaliatory strike. (If communi-

## Today and After START II

“The first Strategic Arms Reduction Treaty (START I), the last Cold War arms agreement, was signed in 1991. It is now being implemented by both countries and will reduce the number of deployed strategic warheads from about 11,000 for Russia and 13,000 for the United States to about 8,000 on each side. START II, signed in 1993 and ratified by the United States in early 1996 but not yet ratified by Russia, would further limit the actual number of deployed strategic warheads to 3,000 to 3,500 on each side. [START II does not limit nondeployed strategic warheads and the United States plans to keep up to 5,000 of them in various levels of readiness. START II also does not limit the number of nonstrategic warheads—active or otherwise—although these have been reduced through reciprocal unilateral initiatives.]”

—*The Future of U.S. Nuclear Weapons Policy*,  
National Academy of Sciences, 1997

cations with the president and defense minister are severed, the chief of the general staff acting alone could authorize retaliation by various means, including the dead hand system.) All in all permission to retaliate would normally have to be obtained within ten minutes after U.S. launch to successfully launch on warning.

The Russians lack confidence in these methods, even though they would beat incoming U.S. ICBMs by ten minutes, because the West could beat the timeline using forward-deployed submarine missiles with flight times as short as fifteen minutes. And these could be fired through gaping holes in the Russian coverage of submarine launch areas—the breakup of the Soviet Union splintered the early warning network. The Russians worry about precursor strikes by nuclear bombers or submarines against critical nodes in the Russian command system. And they worry that political leaders could hesitate too long and other possibilities.

### The Risk of Nuclear Anarchy

The inadvertent launch of nuclear missiles on hair-trigger alert during a crisis has an intermediate

probability that varies according to the state of nuclear tensions between Russia and its potential nuclear adversaries, particularly the United States. Zero alert offers a superior alternative to ABM. Taking all nuclear weapons off alert so that none remain poised for immediate launch is the ounce of prevention for nuclear anarchy in all its many forms. A reciprocal agreement among the nuclear weapon states to adopt zero alert for all nuclear forces would be the most effective hedge against the collapse of Russian command and control.

### America's Unstable Nuclear Posture

The overriding goal of strategic planning is to ensure that U.S. strategic forces can destroy virtually all of the targets in four major categories: nuclear forces, other military forces, the military-industrial sector, and civilian and military leadership.

The extent of the target coverage that strategic organizations expect to achieve, damage expectancy expressed in its simplest form as the percentage of the target base that would be destroyed in retaliation, varies under these conditions. Strategic planners strive to ensure that damage expectancy would approach 100 percent, although 70 to 90 percent would generally meet the minimum essential requirement in the various target categories. These norms powerfully shape the operational predilections of the U.S. command system—for instance, its predisposition to launch on warning instead of launching after an attack is ridden out and its readiness to delegate launch authority down the chain of command beforehand in case presidential direction is disrupted.

The target base has shrunk from 16,000 in 1985 to 2,500 in 1995, a decrease of 84%, but the U.S. active inventory of strategic warheads has dropped from 11,000 in 1985 to 7,800 in 1995, a decrease of only 29%. This weapons-rich situation is unique and should allow for some lowering of alert levels and reduced reliance on both launch on warning and nuclear predelegation.

The 1994 nuclear posture review did consider eliminating launch on warning from the repertoire of current options and adopting a strategy of delayed retaliation, but this proposal was decisively rejected, presumably in part because calculations of target coverage by current and future strategic forces show that launch on warning is necessary to achieve high

damage expectancy.

If U.S. forces on day-to-day alert do not launch on warning, only 47% of the target base would be destroyed. And even if ICBMs launch on warning, the damage expectancy, 66 percent, would still be unacceptable to military planners. It scarcely seems possible that such theoretical calculations would continue to be critically important to strategic planners in the years ahead. A targeting mania permeates the culture of strategic organizations to an extent that is hard to overemphasize.

The nuclear posture review (NPR) reaffirmed a time-honored constraint on the choice of options in the strategic war plan: the minimum SIOP attack in the event of war with Russia requires a comprehensive assault on Russia's nuclear forces and support bases. This represents the largest target category, perhaps 50% of the target base.

Another continuing feature of the U.S. nuclear posture is decentralization. The NPR apparently did not challenge the tradition of predelegating nuclear launch authority to senior military commanders designated as prepositioned national command authorities. Predelegation was practiced throughout the cold war, at least until the mid-1980s, and perhaps remains in effect, an arrangement that has entailed the widespread physical distribution of authorization and unlock codes. The arrangement also entailed giving

the designated military commanders the right to order the implementation of the strategic war plan promptly in the event of a confirmed nuclear attack that disrupts communications and isolates the strategic forces from the President and others in the chain of presidential succession. (The preconditions for exercising this launch authority—verified nuclear detonations and communications outage—are the same conditions that activate the Russian dead hand system.) A case can be made for revoking such arrangements on the grounds that safety takes precedence over the demands of targeting. An unconditional revocation, however, would change the basic character of the U.S. nuclear posture. It would be resisted no less strongly than attempts to promote safety through such other means as eliminating the option to launch on warning.

### Options for De-Alerting

The easiest approach, and the one already implemented by the United States and Russia (subsequently joined by Britain and China) is to aim missiles away from their wartime targets and point them at the ocean. If tradition is a reliable guide, however, retargeting will be undertaken as part of an increase in the defense readiness condition of U.S. nuclear forces during a crisis. Retargeting will likely become a standard operating procedure of nuclear crisis alert.

Crisis management could become complicated if the retargeting step were ordered by the U.S. military at the wrong time under the wrong circumstances for the sake of expediting preparations for retaliation or projecting a greater deterrent threat. Broad ocean area targeting does nothing at all to strengthen safeguards against inadvertent or unauthorized launches aided and abetted by rapid reaction postures. It is misleading to suggest that the end of the cold war has permitted the traditional adversaries to institute less aggressive targeting practices.

Launch on warning is fraught with risk. By risking an inadvertent launch triggered by false warning while making the survival of land-based missiles in a real attack precarious, launch on warning puts enormous pressures on commanders at all levels. Yet both sides remain committed to nuclear strategies geared to beating a thirty-minute launch deadline.

An alternative to ocean targeting is comprehensive detargeting which would strip the targets from every ICBM missile's memory or keep only nominal targets

### New Strategic Guidance Changed Little

The President's new strategic guidance was reported by R. Jeffrey Smith in the December 7 *Washington Post*. The National Security Council spokesman who described it noted that the guidance still allows the United States to launch on warning and to use nuclear weapons first. This means that it still permits a pre-emptive first-strike. Furthermore, the spokesman said that the new directive did not alter a previous requirement that target planners must be prepared in a crisis to offer the president "various nuclear attack options, from initiating a major strike involving thousands of warheads to..." And thousands of warheads is more than enough to destroy virtually the entire Russian strategic force if that force does not launch on warning.

—JJS

## Saints and Devils Thrive on Distance

In a *Washington Post* profile by R. Jeffrey Smith ["The Dissenter", December 7, 1997], General George Lee Butler explained part of his psychological evolution from nuclear warrior to disarmament champion as a consequence of his first visit to the Soviet Union. Smith writes of his arrival:

"But now he felt these jolts...these first impression on the ground. From thousands of satellite photos and 30 years of classified reports, he had expected to find a country far more modern and functional than it was. Instead, he saw 'severe economic deprivation...More than that, it was the sense of defeat in the eyes of the people...It all came crashing home to me that I really had been dealing with a caricature all those years.'"

FAS members will recall, in this connection, the FAS efforts in 1972 to pass the Gravel bill funding Congressional trips to the Soviet Union and, after many such efforts, the campaign waged, in the eighties, to visit every Congressional office to ask the embarrassing question: "Well, have you ever been there?"—which produced 26 Congressional delegations to the Soviet Union. It appears from General Butler's conversion that we were definitely on the right track.

like the oceans. Verification would be monitored and verified by intrusive means including the possibility of a joint U.S.-Russian team inhabiting the launch control centers. Detargeting is not, however, strictly defined, a meaningful option for U.S. submarines which have the inherent capacity to generate targeting data and load it into the missile guidance set. But detargeting, more broadly defined, could mean that submarines would stay out of range of targets during their patrols.

Additional steps to dealert ICBMs could involve having maintenance crews enter each silo and insert a special pin into the motor ignition mechanism—a procedure time-consuming to reverse. One could shut off power to the missiles which would take a very long time to reverse, probably three or four days. If submarine crews refrained from performing the complex and time-consuming procedures required to prepare their missiles for rapid launch, a U.S. subma-

rine's reaction time could be lengthened from fifteen minutes or so to eighteen hours. And the at-sea alert rate of strategic submarines could be cut back as a part of a dealerting policy.

More radical measures could involve transparent arrangements that would take weeks or months to complete. Here a major problem is a lack of workable proposals on how to deploy the forces so that they cannot be employed quickly, and lend themselves to verification of that constraint, yet remain sufficiently survivable and reconstitutable that they could support a strategy of delayed retaliation.

## Safety, the Primary Goal

Safety is not now the primary goal of nuclear security policy but a wiser policy would make it so. Lengthening the fuse could even grow to years. For example, if all warheads were removed from Minuteman missiles, the Air Force estimates that it would require more than four years working at breakneck speed under emergency conditions to reinstall 3 warheads on each of the 500 missiles deployed under START II.

The principle of safety and the enabling arrangements ought to be the core themes of new, top-level political guidance and the key items on the agenda of future nuclear negotiations among the declared nuclear states. □

## Ten Minutes To Discuss

Russian ICBMs can reach the U.S. as quickly as 25 minutes leaving about 20 minutes between picking up their launch and the initial impacts. This would allow high-level participants about ten minutes in deliberations if they wish to be able to launch U.S. strategic forces before the command and control system and land-based missiles sustained damage. This is because the decision has to be made at least five minutes, and optimally ten minutes, before the arrival of opposing missiles to permit two minutes for transmitting launch orders, three minutes for the firing of Minuteman missiles, and several more minutes for the missiles to fly a safe distance away from their home bases, which might have been targeted.

—*The Logic of Accidental Nuclear War*

## FAS Provides Unprecedented Second Award to Garwin

The following citation was provided to Garwin at the FAS Annual meeting on December 12, 1997.

Richard L. Garwin is a truly legendary person—in no less than four entirely different dimensions. Both as a scientist and as an inventor, his accomplishments are so great that he was, this year, awarded America's most desired scientific honor: the Fermi Award. And the number of people who urged the Government to provide this award to him was so large that the Department of Energy has changed its rules to prevent any such future outpouring of respect and affection.

As a contributor to problems of intelligence, he had still another stellar, if subterranean, career for which he has been awarded the R. V. Jones award, named after the famous British scientific wizard of World War II. On its presentation, R.V. Jones commented that when he compared his work to that of Garwin he (Jones) felt a bit like John the Baptist, who said that he would be followed by a greater one "whose shoes I am unworthy to lace."

In the public interest community, Richard Garwin is renown for an entirely different—but equally phenomenal—career along a fourth dimension, that of public policy. Few, if any, public interest groups, in their entirety, have contributed as much as Richard

Garwin, working alone. His contributions to public policy fill hundreds of papers in every area of nuclear policy and disarmament and in many other fields. Omnipresent, it is said that an effective committee is a collection of people including Richard Garwin. And in these committees, if Dick says  $2+2=5$ , even Nobel Prize winners recalculate before replying.

Richard Garwin is a person optimized for his work. Called by Enrico Fermi "the only true genius I have ever known", Dick is tireless, always on-line and always willing to travel. Fearlessly independent, Cartesian and constantly ready to mentor, he is, above all, kind. Such a person can effect an enormous amount of change for good. FAS is particularly indebted to him.

In 1971, a quarter-century ago, FAS gave Dick its first public service award for his unique contribution toward the defeat of the Supersonic Transport, which required, besides his skills, the courage to defy the Nixon Administration by testifying before Congress. Today, we provide an unprecedented second such award for his life's work. Richard Garwin is, truly, a four-dimensional man whose accomplishments in science, technology, national security and public policy will live on forever in space and time.



FAS Chairman Carl Kaysen presents award to Richard Garwin

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