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Senator John Warner, Chairman  
Committee on Armed Services  
United States Senate  
232 Russell Senate Office Building  
Washington DC 20510

Dear Mr. Chairman:

I'm writing to correct the record, relative to recent testimony before the Senate Armed Services Committee by Defense Secretary William S. Cohen that the technical basis for emphasizing ground-based missile defenses was based on choices made in 1991 by the Bush Administration. According to a report in the July 26, 2000, *Washington Post*, he told your Committee that the Bush Administration selected ground-based missile defenses in 1991 as more technically mature and capable of more rapid development than space-based and sea-based alternatives. This is entirely untrue—it is contrary to history with which I am most familiar and indeed helped write.

I was Director of the Strategic Defense Initiative Organization (SDIO) from mid-1990 until January 1993; thus, I had immediate cognizance of all ballistic missile defense matters in the era referenced by Secretary Cohen. Before then, as you know, I closely followed SDI developments from my U.S. Negotiator post at the Geneva Defense and Space Talks from 1985 through 1989. In early 1990, I conducted an independent review of the SDI program for then Defense Secretary Dick Cheney under a mandate from then President Bush and, in my March 1990 report to him, I recommended its redirection to the GPALS (Global Protection Against Limited Strikes) architecture. President Bush formally adopted this plan in January 1991—and I had by then been working vigorously to redirect the SDI program for over six months. GPALS included a National Missile Defense (NMD) segment consisting of 5-6 sites of ground-based interceptors, a Global Missile Defense (GMD) segment consisting of 1000 space-based interceptors, and a Theater Missile Defense (TMD) segment consisting of several systems with sea-, air-, and mobile ground-based interceptors. A global command-and-control system was envisioned to integrate these segments and robustly protect Americans at home as well as our overseas troops, friends and allies from up to 200 ballistic missile warheads launched by any nation.

In my 1990 independent review, I was briefed that the technology for space-based interceptors — Brilliant Pebbles—was technically mature and ready for formal development. This SDIO assessment was supported by independent reviews of the Defense Science Board, the JASONs and other technical groups. Furthermore, because of the global coverage of such space systems, it was clear that Brilliant Pebbles would be the lowest cost and the most militarily effective means of defending both the United States and our overseas troops, friends and allies. It could provide intercept opportunities against attacking ballistic missiles beginning as early as in their boost-phase, throughout their exo-atmospheric mid-course phase, and even into their high-altitude endo-atmospheric reentry phase. [An architecture consisting only of ground-based defenses would clearly be a prohibitively expensive way to attempt to provide such global defensive coverage.] In any case, I recommended that GPALS consist of layered defenses, including space-, air-, sea-, and ground-based segments. Brilliant Pebbles was the most cost-effective GPALS component, by far.

Focused R&D on the Brilliant Pebbles space-based interceptor system was begun by LtGen Jim Abrahamson, the first SDIO Director, in 1987. It was formally designated the "first to deploy" component of American strategic defenses by my immediate predecessor as SDIO Director, LtGen George Monahan, and so announced in a Pentagon press conference which he convened in March 1990—roughly simultaneously with my independent report to Secretary Cheney. Ground-based defenses were assigned to a follower role. Moreover, their programmatic success was expected to be dependent on widespread adoption of the cutting-edge technology being exploited by Brilliant Pebbles—an expectation which, regrettably, has never been realized.

LtGen Monahan established a Brilliant Pebbles Task Force within the SDIO to manage the weapons system acquisition and, on my watch beginning in about May 1990, a competition narrowed the contractor teams to two: ones led by TRW/Hughes and by Martin Marietta. In addition to my supervision as the Acquisition Executive for all missile defense programs, this acquisition process was under Defense Acquisition Board (DAB) oversight. With the approval of the Defense Acquisition Executive, Brilliant Pebbles became SDIO's first approved Major Defense Acquisition Program (MDAP) in 1991. Had this program been allowed to continue, the life cycle cost of the resulting constellation of 1000 Brilliant Pebbles was then expected to be about \$11 billion (in 1991 dollars), which included replacing each satellite once and the costs of full system operations for 20 years. These cost estimates underwent the usual scrutiny of the formal DAB process. If we had been provided the needed enabling policy (freedom from Article V of the ABM Treaty) and the necessary funding, I anticipated that first generation Brilliant Pebbles could have achieved initial defensive capability as early as in 1996.

The ground-based defense segment was not firmed up to anything like an equivalent status until well over a year later, and our progress was interlaced with the heated debate on Capitol Hill which led to the Missile Defense Act of 1991. I'm sure that you recall this period—since you were the primary author and a major proponent of that most welcome initiative after the Gulf War. Under intense Congressional pressure, memorably articulated to me personally by then SASC Chairman Senator Sam Nunn, I very reluctantly agreed to remove Brilliant Pebbles from its eminently deserved acquisition program status in 1992, in return for a Congressional commitment to begin deployment of a ground-based system “by 1996 or as soon as technologically possible” and, within the same statute, a formal promise that Brilliant Pebbles would receive “robust funding” as a technology demonstration program. Removing Brilliant Pebbles from its leading role most definitely was not a free will decision by the Bush Administration, contrary to Secretary Cohen's recent suggestion.

[I hoped to return Brilliant Pebbles to a formal acquisition status as soon as I could persuade the Congressional powers-that-be of the unique maturity, effectiveness and cost efficiency of the technology. The statutory promise—formalized in the Missile Defense Act of 1991—of “robust” funding for this most promising space-based defensive layer was dishonored in 1992, as the legislative record unequivocally reads. Nevertheless, because of its technological maturity, Brilliant Pebbles could have been revived and built faster than the first ground-based NMD site. However, this point was rendered moot by Defense Secretary Aspin's direction to completely terminate the program in early 1993—as he said, “taking the stars out of Star Wars.”]

Of course, I am recapitulating political, not technical or scientific, issues that limited development of Brilliant Pebbles. The undeniable scientific fact is that the Brilliant Pebbles technology was mature in 1991—as the *Clementine* deep-space mission so clearly demonstrated in 1994. This very

successful technology demonstration program was formulated in my office immediately after the Senate floor debate on the 1992 Defense Authorization and Appropriation Bills made abundantly clear that Senator Nunn and his like-minded colleagues were committed to destroying the Brilliant Pebbles program. Barely two years later and at a cost of about \$75 million, the *Clementine* deep-space probe space-qualified the first generation Brilliant Pebbles hardware (scavenged from the then-defunct Brilliant Pebbles program) and software in the first return to the Moon in 25 years — gathering over a million frames of high-resolution imagery in 15 spectral bands and discovering water in the polar regions of the Moon. The small *Clementine* team, which pioneered the “faster, cheaper, better” approach of which NASA Administrator Dan Golden is so fond, was given awards by NASA and the National Academy of Sciences for this most impressive achievement.

But to prove once again that no good deed goes unpunished, President Clinton used his short-lived line item veto authority in October 1997 to kill the proposed *Clementine* follow-on science program, a program roundly supported by the scientific community. In the associated press conference, National Security Council senior staffer Bob Bell made explicitly clear that the President’s veto was because the *Clementine* follow-on program was continuing to demonstrate ever more mature and capable technology that also could be applied to space-based defenses.

Meanwhile, the acquisition program for the ground-based defensive segment has also had a tortuous history. Because of the Congressional mandate in 1991, I worked throughout the Spring of 1992 with the DAB process to gain approval for the National Missile Defense segment of GPALS. As I testified in 1992, we were not able to frame a program to deploy at the first site by 1996; but with the needed funding, we believed we could begin operations with prototypical hardware at a Grand Forks, North Dakota site as early as in late 1997. Fully developed hardware could have been operational as early as in 2002. This program plan was fully coordinated through all of the DoD acquisition offices and submitted to the Congress on July 2, 1992, along with then Defense Secretary Cheney’s indication that he had directed it be implemented as a top national priority.

Congress did not provide the funds needed to reach this objective, but did appropriate \$1.8 billion for FY1993. Notably, Congress dropped a specific date objective (1996 in the 1991 Act) and called for deployment “by the earliest date allowed by the availability of appropriate technology and completion of adequate integrated testing of all system components.” This funding shortfall and redirection from Congress led to a programmatic restructuring and an 18-month slip in the event-driven program strategy demanded by the DAB. The Defense Authorization Conferees did endorse the DAB’s event-driven strategy as an appropriate low-to-moderate concurrency and risk program, observing that this plan could lead to deployment in about 2002. While noting that the Conferees did not yet endorse a decision to fabricate field prototypical elements at the initial site, the Conferees indicated they had no objection to planning for such a contingency as early as 1997 at the initial site. Of course, the Bush Administration’s 1992 plans to reach these 1997 and 2002 dates were contingent on Congress providing the necessary funds—which Congress did not do.

Before the end of my watch, I had re-framed the NMD program to be consistent with the FY1993 appropriations and the Missile Defense Act of 1992. As indicated in my January 20, 1993, End of Tour Report, the DAB had approved a program that, if fully funded, could have begun defensive system operations in North Dakota with fully developed hardware as early as in 2004 (an 18-month slip because Congress did not provide the FY1993 funds necessary to keep the schedule proposed in the July 2, 1992, Report to Congress)—and with prototypical hardware as early as in 2000. The total investment to begin operations at the first site was expected to be around \$22-24 billion in

FY1991 dollars. Brilliant Eyes, the associated space-based sensor system, was expected to cost \$4-5 billion. And the full multi-site NMD system was expected to cost an additional \$16-18 billion — again, in FY1991 dollars. This program plan was fully staffed through the Pentagon’s DAB with costing by independent OSD, Army, and Air Force—as well as SDIO—cost estimators. [Note that the first ground-based site was expected to cost about twice as much as the estimated life cycle cost of the Brilliant Pebbles segment of GPALS, which could have protected the entire world against limited attack. Simulations in 1991, using actual DSP data from the Gulf War, demonstrated that every SCUD launched by Iraq could have been intercepted by the Brilliant Pebbles constellation.]

In any case, the NMD program was fully funded in the out-year Pentagon budget: the Ground-Based Radar and space-based sensor (Brilliant Eyes) programs already were proceeding under fully funded, DAB-approved MDAPs, and Requests for Proposal had been issued to develop Ground-Based Interceptors—formal proposals from the GBI contractors were to arrive in Huntsville, Alabama within 30 days as I departed from SDIO on January 20, 1993. So, the Clinton Administration inherited a fully-approved NMD program—reviewed by the Pentagon’s DAB and consistent with the law embodied in the FY1993 Defense Authorization Act—to build the first site to begin defending the territory of the United States as early as in 2000.

But the Clinton Administration—oblivious to the FY1993 Authorization and Appropriation directives—cut the \$1.8 billion appropriated to develop the ground-based NMD system to \$0.4 billion and returned unopened to the proposing GBI contractors their system development bids. The previously fully funded outyear NMD programs were cut by 80-percent. Ground-Based Radar development for NMD was discontinued—although related development continued because the THAAD GBR is part of the same radar family. Programs for space-based systems were sharply curtailed (as in the case of Brilliant Eyes) or eliminated completely (as in the case of Brilliant Pebbles). Even the Clinton’s administration avowed top priority Theater Missile Defense programs were cut by 25 percent—scuttling the Navy’s missile defense programs and boost-phase intercept technology demonstrations. Other technology programs to cope with the development of likely offensive countermeasures were also sharply cut—leaving current programs open to substantial criticism. Of great importance, the vision was lost for integrating the command-and-control system for forward-based TMD systems with a homeland NMD system.

In essence, these actions effectively destroyed the Nation's space-based missile defense options for the following decade. They also severely handicapped technical prospects for sea- and ground-based defenses, which could have benefited greatly from exploitation of the more mature key technologies that had been developed for space-based defenses in the 1980s and early 1990s.

It is simply incorrect to assert that technology for ground-based systems was more mature in 1991—the opposite was the case then and is, in fact, still the case. Indeed, ground-based systems could greatly benefit even today from exploiting the space technologies developed under the SDI program—which have continued to mature without support from the Pentagon’s missile defense programs. It is shameful that the Clinton Administration has blocked the transfer of such technologies—presumably because their “Star Wars” origins make them politically incorrect.

Incidentally, review of the tortured history (since my 1990 independent review for Secretary Cheney) of the development of sea-based defenses would demonstrate that they, too, can be built sooner, cheaper, and better than ground-based defenses. While being much more cost-effective than ground-based systems from a technical perspective, both sea- and space-based defenses suffer

from the same political problem—Article V of the ABM Treaty blocks their development, testing, and deployment, if they have NMD capability. So the fact that they are less expensive, more militarily effective, and can be built faster from a technical perspective will be of no defensive significance to the United States so long as the ABM Treaty continues to bind the hands of America’s engineers. Furthermore, the fact that sea-based systems can easily be given NMD capability has led to a “dumbing-down” of TMD systems we are building to protect our overseas troops, friends and allies—all to avoid their having any NMD capability.

While I would have preferred an agreement with Russia along the lines the Bush Administration was discussing with Russia after President Yeltsin’s January 1992 proposal to work together to build a joint global defense, I believe further negotiations about the ABM Treaty are no longer wise because of the imminent threat, as made clear by the Rumsfeld Commission. The Clinton Administration broke off those talks in 1993 and instead declared its allegiance to a restrictive interpretation of the ABM Treaty, which it has sought to “strengthen”—adding further restrictions that make more difficult even building effective theater defenses. We need now to build as soon as possible the most effective defenses we can for Americans at home as well as our overseas troops, friends, and allies. I believe this means moving away from the ABM Treaty immediately and building the most effective sea- and space-based defenses we can as soon as possible. If Russia wants to work with us to help build effective defenses for the world community—perhaps along the lines of boost-phase defenses as recently suggested by President Putin—that would be a welcome development. We should be willing to work together with all our friends and allies to build effective defenses for us all. But we need our enslavement to the ABM Treaty to end forthwith.

In summary, SDIO's history offers no support for the revisionist account of the relative maturity of ground- and space-based missile defense technologies in the early '90s recently offered to your Committee by Secretary Cohen (though I have no doubt as to his personal good faith in proffering such an account). Indeed, the historical truth is precisely the opposite of the impression his remarks conveyed. I urge the Committee to take into account this history in its future deliberations.

I appreciate the opportunity to correct the record on this potentially significant point. I would be pleased to discuss these issues further with you.

Sincerely yours,



Henry F. Cooper, Ph.D.

cc: The Honorable William S. Cohen  
Senator Carl Levin  
Senator Wayne Allard  
Senator Mary Landrieu  
Senator Thad Cochran  
Senator Daniel Akaka  
Senator Ted Stevens  
Senator Daniel Inouye  
Senator Trent Lott  
Senator Tom Daschle

Representative Floyd Spence  
Representative Ike Skelton  
Representative Duncan Hunter  
Representative Norman Sisisky  
Representative Curt Weldon  
Representative Owen Pickett  
Representative Jerry Lewis  
Representative John Murtha