

“Nuclear Primacy” is a Fallacy

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It is of the utmost importance that both the U.S. and the Russian Federation permanently demonstrate to the satisfaction of each other that a nuclear war cannot be won and must never be fought.

✘ The March/April 2006 edition of Foreign Affairs featured an article by Lieber and Press, entitled “The Rise of U.S. Nuclear Primacy”, which stated, “It probably will soon be possible for the United States to destroy the long-range nuclear arsenals of Russia or China with a first strike.” The authors conclude: “the age of MAD [Mutual Assured Destruction] is nearing an end.”

Because the article was published by the Council on Foreign Relations, it was viewed as an outline of the official position of the Bush Administration. Hence it has drawn sharp and widespread criticism throughout Russia .

We believe such reactions can lead to a deterioration of relations between the U.S. and the Russian Federation , particularly in the area of nuclear arms control. This is both unfortunate and unnecessary, because the “Nuclear Primacy” argument is based upon flawed logic and questionable methodology.

The conclusions reached by Lieber and Press about a U.S. “Nuclear Primacy” over Russia and the corresponding results of their calculations in tables are erroneous. Although their set of initial data is sufficiently full and correct (Russian nuclear forces and American offensive means), both their model and method of assessing final results are incorrect. We share their concern about the (potential) danger of such a phenomenon as U.S. “Nuclear Primacy” over Russia , but nevertheless we believe that it is absent today and cannot exist in the future.

Our arguments are as follows.

One should not estimate the strategic military results of a massive nuclear strike without first conducting a preliminary assessment of the ecological consequences of such an attack, because these consequences can be clearly unacceptable for both an attacker and the world as a whole. Lieber and Press ignored this consideration.

An ecological examination must include an assessment of all possible aspects of this attack, including the consequences of: hundreds of American nuclear warheads detonating on Russian soil; the destruction of thousands of Russian nuclear warheads and the corresponding secondary effects; the interception of Russian retaliation warheads by U.S. Ballistic Missile Defenses (BMD); and the explosions of Russian warheads on American territory, if U.S. BMD failed. In any case, the results of this examination must be made

public, because the final decision about their admissibility must belong to the people rather than to a handful of politicians and high-ranking military officers.

Lieber and Press examine only one scenario: a Surprise Attack at Peacetime Alert levels (SAPTA). Although they concede that this event is not “likely”, they use this variant as the basis for all their serious conclusions. We will not talk about the moral and ethical reasons, but rather focus upon the political and military-technical issues which render this approach unworkable.

First, to implement SAPTA the National Command Authority (NCA) must have in place a set of legislatively approved special conditions authorizing this action. No such set now exists.

Secondly, the NCA is obliged to inform the nation about this critical decision before a first strike is launched. This must be done if only to provide a time-buffer in which its citizens could implement some measures of protection against the possible negative consequences of the attack.

Third, in order to conduct a first strike it is necessary to implement a number of organizational and technical procedures within the strategic nuclear forces. This is because in peacetime there are numerous procedural and technological blocks in place which are designed to protect nuclear weapons against human error, accidents and sabotage. In order to remove such barriers as a preliminary step towards launching a nuclear first strike, it would require the participation of a significant number of crews on duty working at different operational levels.

The implementation of all the above mentioned circumstances as preparations for a “surprise” first strike would be technically impossible to hide. Therefore, the opposite side would have a certain amount of time to raise the combat readiness of its strategic nuclear forces. If Russia did that, then, as Lieber and Press recognize themselves, nuclear retaliation is inevitable.

Lieber and Press also assume that the Russian Early Warning System will be completely unable to reveal a massed American attack capable of destroying all Russian nuclear forces. “A critical issue for the outcome of a U.S. attack [they say] is the ability of Russia to launch on warning (i.e., quickly launch a retaliatory strike before its forces are destroyed). It is unlikely that Russia could do this.”

We believe this important conclusion demands more serious calculations than the mere statement that “it is unlikely”. It’s necessary to prove that the Russian EWS will be completely incapable of revealing such massed American attack which is capable of destroying all Russian nuclear forces.

Admittedly, the Russian EWS is now weakened. However, if it is able to detect even a small part of the American attack, then it is impossible to rule out the possibility that Russia will react by utilizing the policy of Launch on Warning (LoW), i.e., launching its missiles before the attack is confirmed by nuclear detonations. The number of nuclear warheads in a Russian LoW strike will be far more than in case of a pure LuA (Launch under Attack) variant.

Thus, the implied ecological admissibility of a nuclear strike, the procedural and technical complexities of ordering and executing a surprise attack, and the assumed full inability of

Russian EWS together constitute too many assumptions to be built into such a definitive definition of “Nuclear Primacy”.

A more detailed and technical version of the Foreign Affairs article can be found in the spring 2006 edition of *International Security* (see “The End of MAD? The Nuclear Dimension of U.S. Nuclear Primacy”). Yet even in this longer version of their article, a language of assumptions remains the characteristic feature of the methodology of Lieber and Press.

For example, they write, “The Russian early warning system would PROBABLY not give Russia ‘s leaders the time they need to retaliate; in fact it is questionable WHETHER it would give them any warning at all. Stealthy B-2 bombers COULD LIKELY penetrate Russian air defenses without detection. Furthermore, low-flying B-52 bombers COULD fire stealthy nuclear-armed cruise missiles from outside Russian airspace; these missiles — small, radar-absorbing, and flying at very low altitude — would LIKELY provide no warning before detonation.” We think this isn’t the language of serious proofs, especially on such an important theme.

Lieber and Press state that, “Our model does not prove that a U.S. disarming attack against Russia would necessarily succeed. Nor does the model assume that the United States is likely to launch a nuclear first strike. Even if U.S. leaders were highly confident of success, a counterforce strike would entail enormous risks and costs.” We must ask: if this is so, then how can they predict that “a surprise attack at peacetime alert levels would have a reasonable chance of success”?

As for our own assessment of the model, which is described in detail in *International Security*, it is as follows:

The authors have used an analytical type of model, in which a studied process is imitated with the help of formulas. However, it is well known among experts that creating a more or less correct description of a nuclear war through an analytical model is a hopeless task.

It is necessary to take into account an enormous number of different factors. Even if someone is able to offer a formula (or set of formulas) for each of these factors, it will be impossible to combine them as a whole within the framework of such a complex process.

In any case, such an “analytical conglomeration” will be incredibly difficult to accurately evaluate. We believe a statistical imitation model (SIM) is the preferable medium for such studies.

Apparently, Lieber and Press understood this difficulty very well, for there are only two simple formulas in their calculations: one formula to determine a “lethal range” against a given Russian target, and a second formula to calculate a “single-shot probability of kill” for the selected American warhead. They model only an immediate process of destroying Russian targets, and only for concrete types of “warhead-target” pairs. The authors offer an artificial picture such as the following: American warheads “lie” near Russian targets, and at “X” moment all of them are detonated simultaneously. It isn’t clear from their explanations how individual assessments are combined to tables of results for all Russian nuclear forces.

Therefore, one can say that the authors tried to imitate only the small, final part of the huge process of a nuclear war. Many other serious elements also remained beyond the scope of their research. One should not assume that there will be a 100% probability of such events

as:

a) the strict implementation of launch order by all American duty crews in full accordance to the selected structure of a nuclear first strike (and this structure itself also isn't clear in the given case); i.e., a human factor may be decisive for the real size of an American first strike. Will ALL American duty crews be able to push the button against Russia on one of the cloudless days of peacetime?

b) the inability of the Russian side to use either a LoW or LuA response. Each of many possible variations of a first strike must take this likelihood into account. For example, if all American warheads are launched simultaneously, then they reach targets at different times, and Russia can use information about nuclear explosions for its response. On the contrary, if the structure of the first strike provides a synchronous arrival at Russian targets, then the total flight time required for the American strike is sufficiently large enough to allow Russia a better possibility to detect the initial U.S. launches;

c) the somnolence of all Russian nuclear forces. As we have noted, the slightest sign of a U.S. preparation for a first strike will immediately lead to an increase of combat readiness of at least some part of Russian strategic nuclear forces. Thus, the probability of their survival will be far greater than in case of the variant offered by Lieber and Press;

d) the destruction of the Russian nuclear command and control system (C3). The authors believe that this system will be completely neutralized. However, some portion of the Russian C3 could survive to launch all remaining missiles even after absorbing a U.S. first strike.

It is extremely important to note that the method of "fixed" assessment of results used by Lieber and Press is essentially incorrect. They contradict themselves. On the one hand, they discuss a "95 percent confidence interval" for all these calculations. On the other hand, they say nothing about "non-typical" results within the remaining 5%. However, these "non-typical" results are far more important for a correct assessment of a risk of a first strike than all others listed in Table 4 (Model Results) and in Figures 1-3.

Usually, for ordinary studies of a process with an accidental nature, it is correct to utilize the most probable results for assessment, and ignore the non-typical ones. Lieber and Press transmit this correct rule to their modeling of a nuclear war. This is a serious methodological mistake.

The absolutely unique consequences of nuclear war dictate the need for a quite opposite approach: we are obliged to estimate a risk through the most unacceptable results, even if they are non-typical. Lieber and Press must study this 5% in the first place, but instead they ignore them! This calculation involves the death of many millions of people and quite possibly the destruction of civilization — it cannot be made lightly.

They write, "some probability of nuclear retaliation far below 100 percent should deter almost any prospective attacker. They [critics] err, however, by assuming that any level of first-strike uncertainty will create a powerful deterrent effect. There is no deductive reason to believe that a country with a 95 percent chance of successfully destroying its enemy's nuclear force on the ground will act as cautiously as a country that only has a 10 percent chance of success."

In our view, this is the main error of Lieber and Press. The decisive factor is the EXISTENCE ITSELF of unacceptable results of retaliation, independent of their probability and size. This is because the individual probability of unacceptable results among all possible results of modeling does not play the decisive role; ANY of the calculated results IS possible if a real nuclear war occurs; i.e., IS, but not ARE, because a real nuclear war is possible only one time.

In 1987, American experts stated that, “Dramatically different outcomes might not be downright unlikely, but only less than the expected outcome. The expected outcome, thought the most likely, might nonetheless be unlikely . . . most sinister of all, but almost surely present, are the ‘unknown unknowns’ of which operational planners are not even aware.” (*Managing Nuclear Operations*, by A.Carter, J.Steinbruner and C.Zraket, 1987, p.612)

Finally, Lieber and Press too often refer to history to confirm the correctness of their conclusions. As they suggest, the experience of the Cold War gives them the right to believe that “the possibility of a U.S. nuclear attack should not be entirely dismissed.” We think, however, that historical parallels are always dangerous. But in the given case they are absolutely inadmissible. At least, such conclusions should not be used as the basis for a scientific argument.

OUR CONCLUSION:

We believe the noted shortcomings of both the mathematical modeling and the approach to the assessment of modeling results are enough to consider the main conclusion of Lieber and Press as incorrect. The U.S. cannot eliminate Russian nuclear forces by means of a surprise attack without causing unacceptable damage to itself. We are confident that neither the U.S. nor Russia will obtain “Nuclear Primacy” in the future.

However, in order to adequately resolve this ultimate question, a joint working group of American and Russian official experts should be organized to model all possible present and future scenarios of a nuclear war. Such joint modeling is possible, with the help of already known data plus conditional ones, without inflicting any damage on the national security of both countries. And the results of this cooperation must be open to the public.

It is of the utmost importance that both the U.S. and the Russian Federation permanently demonstrate to the satisfaction of each other that a nuclear war cannot be won and must never be fought.

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