

~~TOP SECRET~~

DECLASSIFIED
R. DAVIS OL-UJAFSHRC (110)

B-60725

THE OPERATIONAL SIDE
OF
AIR OFFENSE

Remarks By
GENERAL CURTIS E. LeMAY
TO
THE USAF SCIENTIFIC ADVISORY BOARD
AT
PATRICK AIR FORCE BASE, FLORIDA
21 MAY 1957

Reproduction of this document in whole
or in part is prohibited without the
permission of the office of origin

COPY 26

~~TOP SECRET~~

B-60725

THE OPERATIONAL SIDE OF AIR OFFENSE

I.

INTRODUCTION

II.

SAC'S JOB

- A. Deterrence/Air Power Battle
- B. Target Systems (JCS)
 - 1. Numbers
 - 2. Toughness
 - 3. Immediacy
 - 4. Future Systems - more and tougher

III.

ATTRIBUTES OF AIR OFFENSE SYSTEMS

- A. Range
- B. Penetration
- C. Accuracy/Yield - % Damage
- D. Speed of Reaction
 - 1. Response (Strategic Vs Tactical Warning)
 - 2. Time to target
- E. Reliability
- F. Confidence

IV.

DYNAMICS OF PROBLEM (TIME)

- A. Targets
- B. Defenses
- C. National Policy

DECLASSIFIED

~~TOP SECRET~~

B-60725

V.

EXISTING AIR OFFENSE SYSTEMS
(Measured Against P. III)

VI.

FUTURE AIR OFFENSE SYSTEMS
(Measured Against P. II)

A. Aircraft

1. B-58
2. B-110A
3. B-125A

B. Missiles

1. Snark
2. Navaho
3. IRBM
4. ICBM

C. Reliability Growth

VII.

STRATEGIC SYSTEMS PRIORITIES

VIII.

INFLUENCE OF BUDGETARY CONSIDERATIONS

DECLASSIFIED

~~TOP SECRET~~

B-60725

INTRODUCTION

You have asked me to discuss the Operational Side of Air Offense, with particular reference to those operational considerations which should underlie an evaluation of manned bombers in comparison with strategic missiles. I welcome the opportunity to do this; and will preface my remarks with two explanations:

First, my discussion of existing U. S. air offense forces deals almost wholly with the B-47/B-52 force. I am fully aware of the existence of rather considerable numbers of air offense units in the Theater Air Forces and in the Navy. But those air offense forces external to SAC actually can participate only to a very limited extent during the decisive first hours of the air power battle. This is evident from detailed examination of operational war plans of all U. S. air offense forces external to SAC.

By direction of the JCS, all JCS Unified and Specified Commanders for the past several years have convened to examine and compare their plans for the air offensive, target by target. In this process, my staff and I have conducted a thorough, detailed appraisal of this nation's total current capability to wage the Air Power Battle. During the past twelve months four such conferences were held at which each commander was required to subject his detailed combat mission plans to the critical examination of all other JCS commanders. The result was a complete, candid revelation of what each command could actually do in its initial strike during the crucial early hours of the Air Power Battle, should it occur in the fall of 1957. Under the ground rules that each force must have an all-weather delivery capability and must be able to launch from its day-to-day positions with no more than tactical warning, the capability to underwrite the destruction of the urgent Air Power Battle DGZ's stood as follows:

DECLASSIFIED

~~TOP SECRET~~

B-60725

SAC Alone	100%
All other JCS Commands including Navy	11%
Navy Alone	5%

Even under an assumption of strategic warning, and making no deduction for normal operational factors such as ground and air aborts, etc., the initial all-weather strike capability of all U.S. air offense forces external to SAC could underwrite the destruction of only 14% of the urgent Air Power Battle DGZ's.

Secondly, I should point out that my evaluation is based on purely operational considerations, unaffected by budgetary influences. But I feel compelled to conclude these remarks by stating my views concerning priorities within the limitations of resources which the Defense establishment can reasonably anticipate. In my opinion, competition for Defense resources should not exist between manned bombers and strategic missiles. Instead, a choice must be made between those weapon systems which cannot contribute immediately and directly to winning the Air Power Battle, and those which can. In my view, the fate of this nation may hinge on this choice.

So much for the explanations.

II.

SAC'S JOB

The objective of our national defense policy is deterrence. In the public mind -- both ours and the Soviets -- deterrence is rooted in fear of nuclear devastation of population centers. However, in the professional military mind -- again, both ours and the Soviets -- deterrence is measured in terms of ability to destroy the enemy's means of long-range delivery of nuclear weapons. This ability -- the deterrent margin -- is determined by that margin of combat-ready capability which one side holds over the other. It cannot be precisely measured. However, unless our forces are clearly capable of winning under operational handicaps of bad weather and no more than tactical warning, and despite any action

DECLASSIFIED

~~TOP SECRET~~

B-60725

the enemy may take against them, our forces are not a genuine deterrent. By "Winning" is meant achieving a condition wherein the enemy cannot impose his will on us, but we can impose our will on him.

The Joint Chiefs of Staff have directed SAC to destroy, as a matter of first priority, "the Soviet capability to launch weapons of mass destruction against areas or forces vital to the United States and allied war effort." In my view, our deterrent strength resides primarily in our recognized capability to win the Air Power Battle. Unless and until the Air Power Battle is won, there is no hope of successful operation by major surface forces. This requires, of course, a successful strategic air offensive. No presently known defensive weapon systems can prevent the success of a properly planned and executed air offensive. This is not to say that air defense systems are worthless; but at the present state of the art, the most important contribution of air defense systems is provision of warning to enable the air offense forces to get underway before they are destroyed at base.

Within the total Soviet target system delineated by the JCS to its commanders, SAC has identified a list of targets which we call the "Air Power Battle Target System." This system includes the Soviet long range air armies (their SAC in being), their bases, their supporting POL and materiel resources, governmental and military control centers with their allied communication networks, and nuclear weapon stockpile and production facilities. Destruction of this Air Power Battle Target System is currently based on 1539 desired ground zeroes, of which 954 require immediate attack in order to minimize the enemy's capability for initial strike. I anticipate a substantial increase in the number of DGZ's during the next five years, inasmuch as our national intelligence estimates indicate that the Soviets are pointing toward a peak in their air offense and defense capability in 1962.

In addition to the number of targets, a primary concern of the operational commander is the toughness of the target -- that is, its resistance

DECLASSIFIED

~~TOP SECRET~~

B-60725

to the effects of the weapons under his control. As you can well realize, the targets mentioned above lie in the category of targets requiring high over-pressures for reasonable probabilities of destruction. This means that weapons must be delivered with either very high accuracy or very high yield, or both.

III.

ATTRIBUTES OF AIR OFFENSE WEAPON SYSTEMS

Keeping in mind the job to be done as detailed in the Air Power Battle Target System just discussed, what are the characteristics of air offense weapon systems which would afford the operational commander the highest assurance of being able to do his job? They are:

- A. Adequate range
- B. Penetration capability
- C. Accuracy/yield relationships
- D. Speed of reaction
- E. Reliability
- F. Confidence

I will discuss each of these in turn.

Adequate range. In view of the possibility that overseas bases could eventually become untenable through either military or political action, the ideal air offense weapon system should have range adequate to strike all targets from its secure day-to-day location in the continental United States.

Penetration capability. This is the ability of the air offense vehicle to cope with the enemy's air defense system. It is the product of such attributes as speed, high or extremely low altitude performance, all-weather operation, electronic countermeasures, and compatibility with other penetration aids.

Accuracy/yield. As I mentioned earlier, the probability of achieving the desired level of target destruction depends not only on the probability of the weapon reaching detonation point, but also on the accuracy with which

DECLASSIFIED

~~TOP SECRET~~

B-60725

it is delivered and the magnitude of the weapon effects. For example, small and tough targets require either extreme accuracy of delivery or extremely high weapon yield, or both.

Speed of Reaction. Since current national policy affords the Soviet the opportunity of attacking with only tactical warning, an air offense weapon system must possess the capability of reacting within the warning time available. We may be so fortunate as to receive strategic warning, but we cannot afford to stake the survival of the nation on the assumption that we will; or that if we do receive it, the national decision-making echelons will act upon it promptly and positively. Moreover, it is unnecessary to risk such an assumption because it is entirely within this nation's capability to maintain a force of proven effectiveness under any weather condition and with no more than tactical warning. It requires, however, organizational and command arrangements which will assure that the complex, worldwide operations of such a force are properly coordinated and controlled so as to exploit the inherent flexibility of offensive air power.

In addition, particularly in winning the Air Power Battle, an effective air offense weapon system should consume the minimum possible time from launch to weapon delivery at the target.

Reliability. Reliability is the probability that a weapon system will perform without malfunction. The higher the reliability of an air offense weapon system the fewer number of vehicles required to do a specified task.

Confidence. An operational commander must have a current estimate of the combat capability of the weapon systems available to him. On the basis of this estimate he decides which weapons and how many he must launch against a given target. If experience with the weapon system is limited, the combat commander will be prone to assign more weapons to a given target in order to avoid too low a probability of its destruction. With extensive experience and consequent higher confidence in his estimates

DECLASSIFIED

~~TOP SECRET~~

B-60725

of system performance, the commander would be able to apply the principle of Economy of Force and thus cover more targets with a given supply of weapons.

IV.

DYNAMICS OF THE PROBLEM

Optimum attributes of an air offense weapon system are related to the time period during which it will be employed. So this is a dynamic rather than a static problem. Despite the advances we have made, witness the narrowness of our margin of combat capability over the Soviet today as compared with that of ten years ago. This means that our force in being today must be progressively strengthened if it is to continue as an effective deterrent. Further, as the number and toughness of the targets increase, the accuracy-yield ratio of an optimum air offense weapon system must increase. Finally, an optimum air offense weapon system must be responsive to changes in national policy, which itself is dynamic.

V.

EVALUATION OF THE EXISTING AIR OFFENSE SYSTEMS

I shall discuss the B-47/B-52 bomber force in terms of the attributes outlined earlier.

Range. In the absence of a truly intercontinental air offense weapon system, thus far we have had to rely on air refueling of the B-47/B-52 bombers and this in turn makes necessary a system of overseas bases. Even with the Model Improved B-52 there would still remain a requirement for air refueling to attack a portion of the Soviet target system.

Penetration. At the present time the losses which the Soviet air defense system can inflict upon the B-47/B-52 force would not prevent us from winning the Air Power Battle. However, unless we improve the penetration capability of the B-47/B-52 force progressively and markedly during the next five years, the attrition rate will increase to a point where by 1962 I could not be confident of winning the Air Power Battle.

DECLASSIFIED

~~TOP SECRET~~

B-60725

Accuracy/yield ratio. Weapon technology, as you well know, has made such rapid advances in recent years that thermonuclear weapons are available today for the B-47/B-52 force. There can be no doubt of the precision with which my combat-ready crews can deliver these weapons to the bomb release line today. Accordingly, I would say that acceptable accuracy/yield ratios currently exist in the manned bomber force. However, we expect to be faced with increasing Soviet capability to interfere with our bombing radar and this requires continued emphasis on electronic counter-countermeasures to insure that the present accuracy/yield ratio is maintained.

Speed of Reaction. Our air offense weapon system must be able to react so swiftly that it will not be caught on the ground and destroyed by the enemy. I am confident that today, under any weather conditions and with no more warning time than that provided by friendly radars, a decisive B-47/B-52 force can be launched against the Soviet Air Power Battle Target System. Bearing in mind the increasing air offense capability of the Soviets and the resultant decrease in warning time likely to be available to us, we have set ourselves the goal of being able to launch at any time, without prior notice, one-third of the SAC force within fifteen minutes. An extensive and thorough test recently completed indicates that this is a reasonable goal if we are provided adequate base facilities to permit wider dispersal in an alert configuration. Once launched, these bombers go directly to target.

Reliability. The current high reliability of the B-47 is the result of four years of intensive field operations, during which we have progressively improved the aircraft sub-systems and our procedures in operations and maintenance. The reliability of the B-47 now stands at 85%. We expect to increase the reliability of the B-52 in the same way.

Confidence. My high confidence in the capability of the present manned bomber force is based upon literally hundreds of thousands of practice combat missions under the toughest, most realistic conditions we have been able to devise.

DECLASSIFIED

~~TOP SECRET~~

B-60725

VI.

FUTURE SYSTEMS

We must evaluate all future weapon systems against the same set of criteria we used to evaluate existing systems. Furthermore, we must bear in mind the increasing Soviet threat as mentioned earlier in the discussion of the dynamics of the problem. I shall now discuss each of the presently proposed manned bombers and strategic missiles in turn.

MANNED BOMBERS

B-58. The B-58's now on order for test are unsuitable, in my opinion, as a follow-on to the B-47's and B-52's because of limited range and limited penetration capability. Convair has provided a minimum military load in the B-58 in order to provide maximum fuel capacity. Although the present B-58's Mach 2 dash capability is in itself a measure of penetration capability, the dash is so short that the benefits to be derived from it are of doubtful value and will certainly decrease rapidly during the early 1960's when this bomber could first become operationally available.

Model Improved B-58. If the performance predicted by the manufacturer for the Model Improved B-58 actually proves out in test, this weapon system could be useful to SAC. However, the Model Improved B-58 falls far short of being a truly intercontinental vehicle. Further, it cannot carry the desired quantities of penetration aids. Further, this model improvement exhausts the growth potential of the B-58; thus its capability to cope with the increasing enemy defenses would diminish unless range were sacrificed.

WS-110A. As you know, the 110A is still in the study phase. Performance estimates are encouraging -- 3,000 nautical mile radius at Mach 3 all the way. Its radius can be increased to about 4,000 miles by using high energy fuels. If the 110A lives up to its design specifications, it will be an extremely useful vehicle for SAC. However, it cannot become available until the distant future; even if we go ahead now, the first wing of 110A's could not be operational until 1965 -- and this is

DECLASSIFIED

~~TOP SECRET~~

B-60725

considered optimistic. Here again, this weapon system is not truly intercontinental.

WS-125A. As you know, this nuclear powered bomber system is in very preliminary study status and component preliminary design stage. It, for the first time, will offer us truly intercontinental range. However, it is not certain that achievement of this intercontinental range is worth the price we must pay in sacrifice of other essential attributes -- specifically, in speed of reaction, reliability, and penetration capability. Furthermore, the 125A cannot enter inventory early enough to be the successor to the B-52.

It is clear that existing and proposed manned bomber systems which I have discussed are deficient in some of the important attributes of air offense weapon systems and will continue to be so. Missile systems currently in development show great promise of augmenting the capability of the manned bomber force by providing those capabilities in which the manned force will continue to be deficient. These systems will have truly intercontinental range. Most of them will have a very high penetration capability primarily because of supersonic speed and altitude. I expect most of these missile systems to attain eventually the necessary speed of response. The ICBM's very short flight time to target has important operational significance. However, as each of the missile systems is measured against the standard attributes, you will see that there are some short-comings which must not be overlooked.

AIR-BREATHING MISSILES

Snark. Although the Snark measures up well against some of the attributes, its lack of penetration capability during the time period in which it will be available is enough to disqualify it as a useful SAC system.

Navaho. If the Navaho is funded so that it will be available in 1962, it could be very useful. Its range, penetration capability, speed of reaction -- all appear to be adequate. Its accuracy/yield ratio

DECLASSIFIED

~~TOP SECRET~~

B-60725

is very good indeed. However, there are those who question the ultimate reliability of the system because of its great complexity.

BALLISTIC MISSILES

IRBM. The favorable characteristics of the IRBM as measured against most of the attributes discussed above are over-balanced by the operational and logistical complexities imposed by its 1500 mile range -- necessitating overseas basing.

ICBM. The nominal 5500 mile range of the ICBM is adequate to afford coverage of the Soviet target system, although it imposes some difficulties in base area selection. As I mentioned earlier, I am confident that this system can be developed to respond within the tactical warning time available. For a long time there should be no question of its penetration capability; and if applied to a proper target system its short time of flight to target can be exploited. Since the initial ICBM will have only a 1 MT warhead delivered with a CEP of 5 nautical miles, the single shot probability of destroying some types of targets is unfortunately very low. Continuing analytical studies in my headquarters are being conducted for the purpose of determining the optimum application of ICBM's to the urgent Air Power Battle target system. It appears now that the prime characteristics of the ICBM can be exploited best by using it initially to damage and disrupt Soviet air offense and defense systems on the ground, holding them down until they can be destroyed by the manned bomber. The ICBM will also be useful in disrupting control centers and their communications and defense networks.

Now I must dwell at some length on the main concern of any operational commander in establishing confidence in his estimate of the combat capability of his weapon systems. Initially, he must expect that any new weapon system will have very low reliability. It is inevitable that in field operational use, difficulties will be encountered which were unforeseen in the laboratories and not uncovered in the testing programs. Furthermore, the rate at which these difficulties will be encountered

DECLASSIFIED

~~TOP SECRET~~

B-60725

depends upon the pace of operational experience with the equipment. Since experience with manned bomber systems is accumulated rapidly, their reliability can be increased rapidly. On the contrary, I am confident that missile systems will not enjoy such rapid improvement in reliability. In the first place, because of their great expense, the rate of expenditure of missiles in training and simulated combat firings will necessarily be small. This means that difficulties will be uncovered over a longer period of time and the opportunity to test fixes will be correspondingly limited. Furthermore, we have had forty years' experience in the operation of manned bombers. Their initial operational problems have developed into recognizable standard patterns. We know how to anticipate trouble and in general we can forecast probable techniques for fixes. Since we are just now entering the missile era, we do not have this background. We cannot anticipate the areas in which to expect difficulties; we cannot now predict reasonable techniques for fixes. This, of course, will not always be the case. I agree that eventually missile systems will reach a satisfactory state of reliability, but I am certain that this will come only after long and bitter experience in the field.

VII.

PRIORITY STRATEGIC SYSTEMS

From these considerations, and based on operational considerations alone, I have recommended the following priority listing for expedited development:

- I. Model Improved B-52 and its penetration aids
- II. 110A Chemical Bomber
- III. Navaho
- IV. ICBM
- V. 125 Nuclear Bomber
- VI. IRBM

DECLASSIFIED

~~TOP SECRET~~

B-60725

You will notice that I have not included the Model Improved B-58 in the priority listing. In the event that programmed testing of the present B-58 should substantiate the manufacturer's claims for the performance of the Model Improved B-58, I may at a later date insert it -- but not as a replacement for the 110A.

Snark and Rascal should be cancelled. I have already discussed the Snark. An appropriate air to surface missile for the B-52 should be developed with high priority, but not from the current Rascal model, which has already been outpaced by the increasing Soviet defenses. A B-52 ASM is an important part of the penetration aids just mentioned in Priority I.

VIII.

INFLUENCES OF BUDGETARY CONSIDERATIONS

Thus far I have been evaluating air offense weapon systems without regard to the influences of budgetary considerations. This approach, of course, is unrealistic. However, in order to treat with this topic, I must go beyond the scope of the subject you assigned me.

As we all know, there is heavy public demand to reduce the total Federal budget and this, of course, would inevitably result in deep cuts in the Defense portion. In my view, some grave decisions must be made because even the present level of the Defense budget, is far below that which will be soon required unless many current weapon systems programs in all three services are promptly eliminated or drastically curtailed.

For example, within the Air Force alone, many weapon system programs initiated during the past 6 to 10 years are just now beginning to reveal their ultimate cost implications in money and in manpower. It is becoming increasingly clear that within the resource limitations which we can reasonably anticipate, the Air Force cannot support all of these programs to their proposed ultimate. In my view, if we do not severely prune out some of these programs, we won't be able to maintain even the manned bomber force at the required level of effectiveness. And that could have fatal end results.

DECLASSIFIED

~~TOP SECRET~~

B-60725

I am confident that the Defense establishment as a whole can produce much more effective combat potential with less money and manpower than we now require. But this can't be done until our national strategy and the resultant military concepts are more specifically designed to exploit the potentialities of modern weapon systems in either General or Limited War.

If I read the heat of the taxpayer's temper correctly, it is high time for the three Services to come up with a sound and specific Priorities Plan for pruning the Defense establishment so as to maintain effective deterrent strength within the limitations of a lower Defense budget. To that end, I propose that:

First, we discard any forces which are not clearly capable of prompt and effective combat in a very short war. This is consistent with present Air Force policy governing mobilization reserve materiel requirements.

Then we should prepare a detailed Plan for Force Reduction based on the following tasks in the priority indicated:

The first and overriding task -- winning the Air Power Battle. I contend that requirements for forces capable of direct and immediate participation in the Air Power Battle must be completely satisfied before we can sensibly invest a nickel in anything else. These forces include, of course, both the air offense forces and a reasonable scale of air defense.

Next -- winning the Undersea Battle. I place this task next after the counter-air task, because the continental United States is vulnerable only to air and undersea attack.

Next - maintenance of "token" surface forces as required to "show the flag," and to help hold alliances together, and to insure that Soviet violation of Free World territory automatically becomes a clear-cut act of war.

Last - maintenance of such other ready forces as may be required for, and capable of, prompt, and decisive employment in the exploitation phase

DECLASSIFIED

~~TOP SECRET~~

~~TOP SECRET~~

B-60725

of a future war. Here let me emphasize that I am not talking about a protracted war. I cannot conceive of major protracted engagements by surface forces which have been previously disembodied by a properly executed nuclear air offensive. I recognize that some clean-up and policing may be required, although I don't foresee any justification for major force requirements for this task.

There is always disagreement over the details of any priorities list. But we can't get anywhere until we agree on a basic concept for applying the totality of U.S. military strength in war, and upon a clear-cut order of priority for the specific tasks that must be performed to carry out that concept. It is the duty of military leaders to reach such agreement without regard to self-interest of the Service they represent.

I have proposed that the Air Force lead the way by drawing up a Priorities Plan for Force Reduction within our own service.

To that end, I have recommended that the Air Force assume a ^{national} Defense policy embodying the following principal points:

1. In any war in which the United States becomes engaged, this nation will employ its best weapons in whatever strength deemed necessary to achieve prompt, favorable decision.
2. Whatever the choice of weapons, the long-range Air Offense Force is fully capable of decisive employment in Limited War without lowering our General War posture to an unacceptable degree. A separate set of specialized tools for Limited War is not required.
3. The overriding task is to win the Air Power Battle. This requires that all offensive air power be placed under centralized command control.
4. Regardless of weapons used or targets struck, Limited War will not expand into General War unless the Soviet Union refuses to accept the defeat of its Proxy, and is not deterred by our General War posture.
5. Force requirements based on the traditional concept and pattern of protracted war are no longer valid.

DECLASSIFIED

~~TOP SECRET~~

B-60725

I am convinced that the total Defense budget is headed downward. Total forces must be cut accordingly. If these cuts are applied in the right places, we can actually produce more genuine combat potential than we now have. Such action will not be taken, however, unless responsible officials in the top-level policy-making echelon issue the necessary policy guidance in more explicit language -- at least as explicit as the recent "Wilson Memorandum" on service responsibilities for guided missiles.

I am fully aware of the difficulties involved in issuing explicit directives under our present Defense organization wherein compromise is prerequisite to agreement among service chiefs and department heads, each of whom acts as a special pleader for his particular organization. In principle, I fully support compromise as an essential element of the decision-making process in our democratic society. But when the necessity for compromise plainly jeopardizes our capability to win the Air Power Battle, I feel compelled to speak up.

I repeat that until the requirements of air offense forces capable of immediate and decisive participation in the Air Power Battle are satisfied, we cannot sensibly invest a nickel in anything else. You have already seen that during the crucial early hours of the Air Power Battle, existing air offense forces external to SAC could actually contribute very little. I ask you to consider beyond that, the huge national investment in still other weapons systems which cannot even participate in the Air Power Battle. Furthermore, their force levels are predicated on the assumption that future wars -- either Limited or General -- may be protracted. In my view this is inconceivable, if the air offense forces do their job.

6. Forces incapable of prompt, effective employment in a very short war should be phased out. Thereafter, force priorities should be based on the following tasks in the order indicated:

A. Winning the Air Power Battle.

DECLASSIFIED

~~TOP SECRET~~

~~TOP SECRET~~

B-60725

- B. Winning the Undersea Battle.
- C. Token forces to "show the flag" in peacetime.
- D. Moderate surface forces for exploiting favorable decision in the Air Power Battle.

If our overall Defense policy is revised along the foregoing lines, we should be able to maintain the requisite combat-ready capability of the manned bomber force without unacceptably detracting from strategic missile development during the next 10 to 15 years. If we do not take drastic action along these lines NOW, either the total Defense budget must be appreciably increased or our margin of combat capability will be dangerously narrowed during a most hazardous decade -- the critical 1960's.

DECLASSIFIED

**NATIONAL
SECURITY
ARCHIVE**

This document is from the holdings of:

The National Security Archive

Suite 701, Gelman Library, The George Washington University

2130 H Street, NW, Washington, D.C., 20037

Phone: 202/994-7000, Fax: 202/994-7005, nsarchiv@gwu.edu