OUR NATION'S NUCLEAR WARNING SYSTEM:
WILL IT WORK IF WE NEED IT?

HEARING
BEFORE A
SUBCOMMITTEE OF THE
COMMITTEE ON
GOVERNMENT OPERATIONS
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I am not a technical expert. I am not saying I can give you the definitive technical answer. My recommendation is that, clearly, these things need to be analyzed and weighed.

Mr. SAXTON. One final question, Mr. Chairman.

Is it your feeling, then, that our present system has not been adequately maintained or that the technology is not state of the art to the extent we want, to feel we can depend on it?

Mr. Ford. I think the present system is a mess.

Mr. SAXTON. Is it because we don’t have the technology, the technology is not in place to do a good job; or because we have neglected the technology that is available?

Mr. Ford. Maybe you were not here at the outset. I said at the outset there were various premises upon which the planning was done, and we clearly did neglect the technology; we neglected the system. The military has been much more interested in other systems, has assigned a very low priority to this area. This country has fantastic technology, and it is an embarrassment to this country to have such shoddiness throughout the command and control system.

We ought to be able, with all the technical and scientific and financial resources we have, to build a first-class system. We don’t have a first-class system. I think that is wrong.

Mr. SAXTON. Thank you, Mr. Chairman.

Mr. Brooks. Thank you very much, Mr. Saxton.

I want the other question. What did you find to be the survivability of the Looking Glass? Is its communications system adequate to be the final arbiter of doomsday?

Mr. Ford. Well—

Mr. Brooks. You talked about the Air Force general and his battle staff in Looking Glass as the final alternative to pushing the button.

Mr. Ford. Looking Glass doesn’t have a very impressive communications capability. In the first place, in normal circumstances it is dependent on the telephone system. It looks into the telephone system by way of four ground entry points—the places in Kansas and Nebraska that I mentioned as possible targets in my testimony.

If you look at the type of unclassified material you get from SAC—and I received this in an unclassified briefing—it identifies the ground entry points for Looking Glass. You know the entry points can be targeted. You know the land lines themselves are vulnerable to EMP, so there is a problem with that communication link.

There is a problem with other radio frequencies because of how they would be affected by nuclear detonations. The plane has limited satellite backup, but one that has its problems.

The one system that I was fascinated by is the very low frequency antenna that can unreel behind the plane when necessary; this antenna, when fully deployed, is 25,000 feet long. It is a heavy, copper-jacketed steel wire that weighs almost a ton.

When I was onboard the standby Looking Glass plane that SAC let me look at, I talked to the crew and the battle staff and to the pilot. I fly, myself, a little Super Cub, and I was talking to him sort of pilot to pilot, and I said, “How do you fly the plane with 25,000 feet of wire behind it?” He said, “Well, you know, it can be difficult and we have to keep to straight level and gradual turns.”

One of the communications technicians volunteered the observation, “We never let this thing out when we are over land in peacetime.” And I said, “Why not?” And he said, “Well, you know, people could be hurt if it falls off.”

I asked, “Does that happen?” He says, “Oh, well, we lose a wire from time to time.”

I checked and found that that indeed happened. Air turbulence is the problem. I was amazed.

This thing is called the Survivable Low Frequency Communication System, and because of its range and because of its relative resistance to jamming, if all these other communication systems onboard the plane fail, then this would become the primary means of issuing the emergency action messages and of doing things like communicating with the Navy’s SACCOM planes. And it falls off. Of course, it is too big; they don’t have room to carry a spare.

I just at that point was amazed that this is the airborne command and control capability that we have on a day-to-day basis to protect us against surprise attack. I couldn’t believe it, but it was true.

Mr. Brooks. Mr. Horton.

Mr. Horton. You mentioned, Mr. Ford, the telephone incident. Did you do any research into the ways in which the President could be informed about a situation which might arise? In other words, is that the only means?

Mr. Ford. In addition to telephone land lines, there are other systems and satellite systems and there have been ways to avoid the problem of electromagnetic pulse.

I looked at that and talked to experts about that, and the feeling seemed to be that the problem was that all of the means for communicating the information to the President, all of them, the primary means and the backups, could be destroyed in a relatively small but well-targeted Soviet attack.

Mr. Horton. Thank you.

Mr. Brooks. Thank you very much, Mr. Ford.

Our last witness this morning is Dr. Bruce G. Blair, author of a book entitled “Strategic Command and Control.”

Dr. Blair is an expert in the area of the strategic command and control. He has served as an officer in the Strategic Air Command, a project director at the Office of Technology Assessment, and, until recently, as an official within the Department of Defense.

Dr. Blair is also the author of the Office of Technology Assessment study that the Department of Defense asserts is too classified for the Congress or for Congressmen to see. For that matter, the DOD claims that Dr. Blair is not cleared to see it. He probably doesn’t need to because he wrote it, but it is an interesting evaluation of his material. You may proceed as you see fit. Your statement will be made a part of the record.

STATEMENT OF BRUCE G. BLAIR, AUTHOR, “STRATEGIC COMMAND AND CONTROL”

Mr. Blair. Thank you, Mr. Chairman.
Mr. Chairman, a gross imbalance in attention and resources within our Defense Department during the past 25 years has produced a powerful survivable nuclear arsenal but placed it under weak, vulnerable control. Today's hearing reflects a growing awareness of the need to rectify this imbalance.

The pace of modernization of strategic command and control communications and intelligence has not been fast enough due in part to the fact that grave weaknesses in our control system have not been adequately appreciated outside a narrow circle of specialists. Now, there are some knowledgeable individuals who will say that these weaknesses have been blown out of all proportion. I am the first to admit that the complexity of our control apparatus and uncertainties of its performance while under attack leave ample room for disagreement among expert analysts. In many respects, the enormously complex system that has been created to manage nuclear forces just defies comprehension. Yet, even allowing for a wide band of possible error, the system, frankly, does not inspire very much confidence in its ability to function coherently during wartime.

Evidence drawn solely from the public record supports the following five judgments: One, existing deficiencies cast fundamental doubt on the ability of the United States to implement the traditional simpler doctrine of comprehensive retaliation. Our ability to retaliate is less certain than is commonly believed or officially asserted.

Two, existing deficiencies cast very strong doubt on our control system's ability to support our current up-to-date nuclear strategy of flexible response and controlled escalation. It is quite obvious that American nuclear doctrine has been racing way ahead of actual command and control capability.

Three, a large discrepancy exists between the retaliatory character of our declared doctrine and the massive degradation of U.S. second-strike capability that would occur if the command system tries to ride out an attack. Declaratory doctrine is a poor guide to actual employment doctrine. At present, we are operationally geared for launch on warning, a reflection of the low confidence we have in our ability to absorb the brunt of an attack before retaliating.

Four, launch on warning using the present defective control system does not allow decisionmakers sufficient time and information to weigh options rationally. The time available for decisionmaking could be as short as a couple minutes and our warning system cannot give the President or the decisionmaker an accurate prediction of what targets are under attack. In addition, the severe time and information constraints that launch on warning imposes on decisionmakers can only heighten the risk of inadvertent war due to false alarms, misperceptions, or miscalculations.

Five, and lastly, modern nuclear forces have created a problem of unprecedented difficulty for command and control, and that is, ensuring the survival of legitimate nuclear decisionmaking authority, and providing that decisionmaker with the means necessary to exercise this authority, while at the same time ensuring that nuclear weapons cannot be used in the absence of legitimate authority. Though this problem cannot be publicly examined in full, there is no doubt it is a very knotty one. Suffice it to say that the President and all of his legal successors are exposed to sudden attack; that a conditional delegation of nuclear release authority appears to be necessary to cover contingencies in which the statutory succession list is decimated; and that the President is constitutionally empowered to delegate nuclear release authority to any individual he chooses, regardless of his or her qualifications to succeed to the Presidency.

In this arena, basic legal questions have not been fully resolved. For example, does pre-delegated authority legally survive a deceased President if statutory successors defined by the Presidential Succession Act of 1947 are available?

I would like to enlarge on only one of the above judgments, specifically the subject of launch on warning since our deterrent threat presently leans so heavily on it.

Launch on warning requires a rapid transition from a state of tight, negative control designed—

Mr. Horton. Tight what?

Mr. Blair. Negative control designed to prevent accidental or premature release of nuclear weapons, to a state of maximum positive control designed to ensure coordinated retaliation. Now, this transition must occur in just a scant few minutes, and there is obvious potential for enormous friction and tension between these priorities. The problem of balancing these paramount objectives imposes very elaborate operational requirements on the control system—largely to effect a smooth transition in the event of actual attack, while preventing false alarms from inducing a spontaneous shift. These requirements subject command and control to unusual stress. This stress is especially acute within the tactical warning system. Organizations responsible for alerting the strategic forces to attack, alerting the military commanders and national command authorities to impending nuclear attack, utilize both tactical and strategic warning indicators and require positive attack reports from at least two different types of sensors: for example, satellite infrared and ground radar.

Called dual phenomenology, the use of multiple independent tactical warning sensors together with confirmation provided by human operators of the sensors can and does increase the fault tolerance of the warning system. However, sensor design deficiencies, equipment malfunctions, glitches in computer software, maintenance problems, vulnerability to nonstrategic attack or unintended collateral damage, and psychological stress on personnel charged with the responsibility for reaching definitive judgments within a very few minutes, combine to diminish significantly, in my opinion, the confidence that the overall tactical warning system warrants.

The level of confidence the system warrants is high, I think, but certainly not high enough to justify the degree to which the United States relies on launch on warning.

Other major uncertainties that plague launch-on-warning strategy concern, first, the integrity of terrestrial communications used for decision conferences between the national command authorities and his senior military advisers as well as for the rapid dissemination of launch orders, and second, the vulnerability of national
command posts to submarine-launched ballistic missiles with very short flight times.

Terrestrial communications relied upon for launch or warning might be severely disrupted by high-altitude nuclear explosions as early as 4 minutes into the attack. The communications network also contains critical nodes whose loss to sabotage could cause widespread outages.

The primary communications links are also insecure. They can be eavesdropped upon by the Soviet Union in real time and it is not inconceivable that Moscow could know about our retaliatory decisions and orders before our own forces received the order.

Concerning the command posts, those most capable of supporting the national command authority and launch-on-warning strategy might be quickly disabled by blast effects produced by sub-launched missiles arriving roughly, say, 7 minutes into the fight. The more survivable airborne command posts would probably have to assume primary responsibility for implementation of launch on warning and there is considerable doubt whether this system could carry out this responsibility.

Now from the perspective of conservative Soviet planners, the capability of the United States to launch on warning is probably very credible. The advantage of this perception to the United States is that it reduces the appeal of Soviet preemptive. If conservative Soviet calculations discount the vulnerability of U.S. forces and command control because U.S. launch on warning appears credible to them, American reliance on this strategy does have its advantages. It would reinforce the credibility of the American threat to retaliate, and it would also bolster Soviet confidence in a nuclear crisis inasmuch as the strategy explicitly conceals the nuclear initiative of the Soviet Union. Credible reassurance in a crisis is fostered by a posture that permits a shift from negative to full positive control only upon receipt of verified tactical warning of Soviet attack.

In summary, I reassert the fact that the United States relies heavily on launch on warning for positive control, for force coordination and for retaliation. Fortunately, our tactical warning system on which launch on warning depends is fairly fault tolerant. But, again, it is not as tolerant as it should be to justify U.S. reliance on it.

Furthermore, launch on warning requires a rapid and smooth transition from negative to positive control, a requirement which, for psychological and technical reasons, is very difficult to meet with high confidence.

It is much harder to propose solutions to some of these broad problems than to identify them but I will outline several basic ones that seem essential to sustain progress. I will discuss three.

One, revisit management structures within the Defense Department.

Two, pursue with renewed vigor a political consensus on the priority of command and control and tactical warning improvement.

And, three, adopt a strategy and develop a corresponding command system to provide the President with the option of withholding all or part of the nuclear arsenal in the wake of a Soviet attack with the assurance that withheld forces could later be directed to coherent national purposes.

Regarding management structures, I think it is fair to say that while the nature of the command and control beast demands careful integration at an early stage of design and development, the planning, programming, and budgeting practices of the Defense Department have historically encouraged a piecemeal approach. As senior officials from every administration from Kennedy to Carter have testified, the PBO, as practiced, has been the nemesis of overall systems integration. Attempts at overlaying corporate management have simply run afoul of the legal foundations and the core institutional traditions of the Defense Department. Therefore, a consolidation of budget and programming authority within a single agency is to be recommended, as was proposed by a Defense Science Board task force in 1978. Such an agency could overcome the perennial resistance of the services to fund vital programs like the modern aircraft once slated to replace our obsolete aircraft relied on to relay launch orders to the submarine forces.

Regarding political consensus, which is probably necessary to implement it, the change just noted, the most encouraging development in recent years was the President's announcement in October 1981 that C3I modernization would henceforth take precedence over other programs. This represented something of a watershed. And hope was raised further when the Secretary of Defense, in his report on C3I modernization, reiterated the President's words that the C3I modernization continue to have the highest priority. But if the President's words laid the groundwork for shifting the focus of concern, it still fell to others to drive the wedge into established policy. That has not been accomplished.

Despite several years of relative prominence, the command problem still has not been vested with the policy significance it deserves, and we are nowhere near galvanizing the broad spectrum of groups whose support is essential. Fissures exist within the Pentagon itself and we still face the uphill battle for domestic consensus. The general public, among others, and C3 specialist communities are barely acquainted. The community of specialists concerns itself with its strengths and weak points in positive control, that is, vulnerability and other deficiencies that undermine the ability of the United States to retaliate effectively in the wake of an attack. The public harbors fears of catastrophic failure of negative control, that is, breakdown of safeguards against accidental or unauthorized weapons release. The threat of inadvertent nuclear war produced by human error or computer error or false alarms or willful acts by those entrusted with custody of nuclear weapons which has just, frankly, been firmly planted in the public psyche. Although these worries are largely unjustified, they are not entirely baseless, and I believe, our brief for command modernization ought to acknowledge that the demands of both positive and negative control are not fully satisfied in practical terms, though the public should have reasons to feel confident that our controls are being designed to minimize risks in both dimensions.

The sticky wicket in the formulation and presentation of our brief for command modernization is the high level of security classification that we are forced to wrap around the subject. This is a severe handicap. Forging a broad consensus necessary to implement any
nuclear policy requires a forum for meaningful discourse. The dilemma for this topic is that its sensitivity dictates a high degree of secrecy and that massively dilutes the dialog. The flow of information, exchange of ideas, clash of perspectives, and the rest are severely restricted, and as a consequence, informed consensus seems a somewhat remote prospect.

This unavoidable imposition means that the consensus necessary to vest command modernization with the policy significance it warrants will rest to a considerable extent on faith. How this can be managed in a political climate hardly conducive to inspiring trust is anyone's guess. All the more reason why we ought to pause to reflect on our aims, methods and responsibilities in this matter of consensus building.

Turning finally to the third recommendation, perhaps the more radical one, which is to adopt a strategy and command system that could relieve pressures on decisionmakers to authorize retaliation before they could possibly have a chance to comprehend what is happening and rationally formulate a response. If deterrence of strategic attack would some day fail, and weaknesses in C3 can only increase this risk, then surely the situation would demand urgent but also deliberate, informed reconsideration by national leaders of American national security interests and of the proper role of nuclear weapons in serving them. Forcing decisionmakers to decide such matters in a few minutes or even a few hours only diminishes the roles and responsibilities of national leaders in time of great national emergency.

Consensus on this, of course, is a long way off, given, among other things, the really frightful financial burden that such a structure would carry, but I believe that this consensus is the most essential of all. And, further, I believe that it is very compatible with the traditional second-strike principles that emphasize the importance of being able to respond to an attack in a careful, deliberate manner. These principles have long been familiar to and accepted by the Congress, the press, academia, and the attentive public. They remain worthy aims.

Meanwhile, our forces are going to remain on more or less hair trigger, a fact that recommends making NORAD and the unified space command the focal point in the modernization effort. General Herres ought to be given whatever resources and authority are necessary to turn his command into the most modern, effective intelligence fusion center in the world.

Mr. Brooks. Thank you very much.

[Mr. Blair's prepared statement follows:]

Statement of Dr. Bruce Blair
Legislation and National Security Subcommittee
Hearing: Our Nation's Nuclear Warning System: Will It Work
If We Need It?
Thursday, September 26, 1985

Since the beginning of the nuclear age, a very narrow view of nuclear capabilities has dominated the strategic debate in the United States. This view focuses typically on the number, technical characteristics and cost of nuclear weapons. It excludes the technologies and procedures created to manage those forces and barely acknowledges the seemingly obvious fact that if command-and-control fails, almost nothing else matters. This imbalance in attention and resources during the past 25 years produced a powerful, survivable arsenal, but placed it under weak, vulnerable control.

Today's hearing reflects a growing awareness of the need to establish a broad consensus on the importance of improving strategic command, control, communications, and intelligence (C3I). This process of consensus-building begins with an appreciation of weaknesses in the overall performance of the command-and-control system. There is ample room for disagreement on this score, because the complexity of C3I defies full comprehension, but even allowing for a wide band of uncertainty, the analysis of information and the public record does not inspire high confidence in the coherent functioning of the C3I system in a nuclear environment. Weaknesses in the system cast fundamental doubt on its ability to support the simpler, traditional nuclear strategy of swift and comprehensive retaliation, and cast very strong doubt on its ability to support our current national strategy of flexible response.

Thus, one of the broad conclusions arrived at is that American nuclear doctrine has been racing way ahead of C3I capability. As doctrine evolved from massive retaliation toward notions of flexible warfighting, C3I stood virtually still.

Another conclusion grows out of the discrepancy that is found to exist between the retaliatory character of our doctrine and the vast destruction of U.S. second-strike capability that might occur if the command system tried to ride out a
Soviet attack, particularly a surprise attack. C3I weaknesses have created strong disincentives to absorb the full weight of attack before retaliating and has resulted in a C3I system geared, though not optimally, for launch-on-warning. And because launch-on-warning is less likely to allow decisionmakers sufficient time and information to weigh options rationally, the control system itself has introduced a volatility into crisis decisionmaking. Longstanding C3I deficiencies, not recent Minuteman vulnerabilities, should be underscored in historical assessment of crisis stability. In fact, it seems reasonable and fair to assert that these deficiencies have been so severe for so long that developments in the areas of perceived importance—remember that strategic debate has been keyed to nuclear weapons rather than the means of their control—that these developments long ago became practically irrelevant to the nuclear confrontation.

Let me now enlarge on the conclusions sketched above, beginning with the contention that our C3I cannot mount a coordinated second strike after the brunt of a Soviet attack is received. Under most scenarios, C3I damage suffered during the first half-hour would be so severe that retaliation would have to be ordered in the immediate wake of the assault. Furthermore, retaliation would have to be organized around a large option involving thousands of nuclear warheads, for two reasons. First, the U.S. assessment system is presently incapable of accurately depicting the character of an attack by modern Soviet forces. Such systems would also probably cease to function altogether by 20 minutes into an attack, and perhaps earlier. Decisionmakers might be provided with a fairly reliable estimate of the size of the initial salvo, but neither the full magnitude of the attack nor the exact weapon aimpoints would be determined. Too much would be at stake to give the attacker the benefit of the doubt.

Second, decisionmakers would be forced to write-off forces that they withhold, due to the short endurance of the airborne command network. The coherent endurance of this network could not be confidently expected to exceed several hours. Electing to exercise a small SIOP option means that all other options are forever relinquished; that small option would represent everything that decisionmakers could expect to accomplish militarily for the duration of the war. The situation would thus encourage selection of a major attack option.

Necessary arrangements for implementing this prompt large-scale response in the immediate wake of a Soviet nuclear attack cut across three distinct functions: attack warning, decisionmaking and communications. Past and current U.S. arrangements, however, have not been adequate to ensure successful implementation under all plausible conditions. Serious deficiencies persist in all three functional areas:

**Warning.** Credible, timely, and reliable tactical warning is needed to assure the safe relocation of mobile force and C3 elements that depend on tactical warning of an in-progress attack for their survival. These elements are, notably, strategic bombers and C3 aircraft. My summary judgment is that tactical warning systems are not adequate to ensure the pre-launch survival of these aircraft, the loss of which would severely undermine force coordination.

The main deficiency in the warning system, particularly reawakening communications (sensor-to-decisionmaker), is vulnerability to electromagnetic pulse effects. Early EMP events threaten to shut down communications used to order these aircraft to launch for survival. Putting mobile assets on airborne alert to compensate for this deficiency in a crisis would strengthen the credibility of our threat to retaliate during the initial period of crises, but airborne operations would be difficult to sustain beyond several days and severe penalties would be incurred after 7-10-days.
Decisionmaking. The President or his successors, and any individuals who possess legitimate delegated authority to order the implementation of the SIOP, must be adequately protected from Soviet nuclear attack. Adequate protection means that the release authority can survive long enough to consider options and issue instructions. In the likely event of incapacitation of the President during the initial attack, the command-control system must permit an orderly and timely transfer of authority to a successor. Key military commanders and other advisory staff, as well as commanders of the executing forces, also need adequate protection from attack. Finally, an element of the National Military Command System (NMCSS, ANMCC or other designated back-up NMCS command centers) must survive long enough to construct the appropriate emergency action message and disseminate it to the executing commanders.

These requirements raise questions that cannot be definitively answered on the basis of the public record, but there is little doubt that the problem of protecting key decisionmakers is a knotty one. The ground command posts that support them are acutely vulnerable to sudden destruction and the airborne command centers are significantly vulnerable to a variety of nuclear hazards. Key command aircraft on ground alert have small margins of safety to escape their bases prior to destruction by incoming SSUSS. Continuous airborne alert could not be maintained long in a nuclear crisis. The telecommunications links connecting the decisionmakers during the SIOP decision process are not as robust or reliable as circumstances demand them to be. My summary assessment is that deficiencies in this area cast doubt on the credibility of any threat to retaliate after absorbing the brunt of an attack.

Communications. The orders to retaliate must be successfully disseminated to the executing forces. Dissemination of the IAM relies on a large network of redundant communications channels. Most of this network, however, would not survive beyond the first ten minutes into an attack. The most survivable network, called the Minimum Essential Emergency Communications Network (MEECN), is designed to provide low data rate, one-way EAM dissemination to the forces in a nuclear environment. This network consists of several discrete communications systems--satellites, aircraft, and communications rockets.

Deficiencies in the MEECN network also cast doubt on our ability to ride out an attack before retaliating.

In sum, the ability of current U.S. C3I arrangements to provide positive control of retaliatory forces in the wake of a Soviet nuclear attack is highly questionable. Since the U.S. C3I system cannot ride out an attack with high confidence, we depend heavily on our retaliatory credibility on strategies that utilize the U.S. C3I system while it is still substantially intact.

Three strategies that exploit an intact C3I network are first strike, preemption and launch-on-warning. Since the United States Government has not been attracted to nuclear strategies based on first strike or preemption, then, by default, the U.S. strategic posture would be geared for launch-on-warning.

A launch-on-warning response would be large in scale regardless of the size and pattern of the Soviet attack. The situation is very similar to that discussed earlier, except that the bias toward large-scale response is even stronger in the L-O-W case than the ride-out case due to the greater ambiguity surrounding the character of the Soviet attack and the shorter list of options that decisionmakers could consider in the few minutes available.

Launch-on-warning requires a rapid transition from a state of tight negative control designed to prevent accidental war to a state of maximum positive control designed to ensure retaliation. There is obvious potential for enormous tension and
friction between these priorities. The problem of balancing these paramount objectives imposes elaborate operational requirements on the C3I system—largely to effect a smooth transition in the event of actual attack, while preventing
false alarms from inducing a spontaneous shift. When the dominant priority of
strategic organizations is shifting away from negative to positive control,
the requirement would be subjected to unusual stress.

This tension is especially acute within the tactical warning system.
Organizations responsible for alerting the strategic forces, military commanders
and national command authorities to impending nuclear attack utilize both tactical
and strategic warning indicators, and require positive attack reports from at least
two different sources of tactical warning, e.g., satellite infrared and ground radar.
Called "dual phenomenology," the use of multiple, independent tactical warning
sensors together with confirmation provided by human operators of the sensors
inspires confidence in the fault-tolerance of the overall system.

Sensor design deficiencies, equipment malfunctions, glitches in computer
software, maintenance problems, vulnerability to non-strategic attack or unintended
collateral damage, and psychological stress on the personnel charged with responsibility
for reaching definitive judgments within a very few minutes, combine to diminish
significantly the confidence that the overall tactical warning system warrants.
The level of confidence the system warrants is high, but not high enough to justify
the degree to which the United States relies on launch-on-warning.

If less than complete confidence in the tactical warning system impedes the
shift to positive control in the actual event of Soviet nuclear attack, reliance
on L-O-W would be less desirable on the grounds that it is less feasible. However,
L-O-W is technically more feasible than the principal alternative—ride-out, due
due to the greater physical coherence of the C3I system during the pre-impact phase
of the attack. Major uncertainties nonetheless plague L-O-W. They concern (1) the
integrity of terrestrial communications used for the SIOP technical conference
between the NCA and his senior military advisors, and for the rapid dissemination
of the SIOP execution message to the forces; and (2) the vulnerability of the
national command authority to Soviet SLBMs with short flight times. Terrestrial
communications relied on for L-O-W might be severely disrupted by precursor
EMP events (4 minutes into the attack) in the atmosphere. The network also
contains critical nodes whose loss to sabotage could cause widespread outages.
The command post most capable of supporting the NCA and L-O-W strategy might
be quickly disabled by blast effects produced by early SLBM arrivals (7 minutes
into the attack). In either event, the airborne command system would assume
primary responsibility for implementation of L-O-W. There is considerable
doubt whether this system could carry out this responsibility.

From the perspective of a conservative Soviet planner, the capability of
the United States to launch-on-warning is probably very credible. The advantage
of this perception to the United States is that it reduces the appeal of Soviet
preemption. If conservative Soviet calculations discount the vulnerability of U.S.
forces and command-control because U.S. L-O-W appears credible to them, then
American reliance on this strategy does have its advantages. It would reinforce
the credibility of the American threat to retaliate. It would also bolster Soviet
confidence in a nuclear crisis launch as the strategy explicitly concedes the
nuclear initiative to the Soviet Union. Credible reassertion is fostered by a
posture that permits a shift from negative to full positive control only upon
receipt of verified tactical warning, i.e., confirmed warning that a nuclear attack
is in progress.
In summary, I restate the fact that the United States relies heavily on L-O-W for positive control. Fortunately, our tactical warning system on which L-O-W depends is fairly fault tolerant. But it is not as tolerant as it should be to justify U.S. reliance on it. Furthermore, L-O-W requires a rapid and smooth transition from negative to positive control, a requirement which for psychological and technical reasons could not be met with high confidence. Nevertheless, L-O-W is probably credible to Soviet planners, in which case it acts as a deterrent and as a potential source of reassurance in a nuclear crisis.

It is much harder to propose solutions than to identify problems, but I'll outline several basic changes that seem essential to sustained progress. I'll discuss three: (one) revise management structures within the Defense Department, (two) pursue with renewed vigor a political consensus on the priority of C3I improvement, and (three) adopt a strategy and develop a corresponding command structure to provide the President the option of withholding all or part of the nuclear arsenal in the wake of a Soviet attack, with the assurance that withheld forces could later be directed to coherent purposes.

Regarding management structures, it is argued that while the nature of the C3I beast demands careful systems integration at an early stage of development, the planning, programming and budgeting practices of the Defense Department have historically encouraged a piecemeal approach. As senior officials from every Administration from Kennedy to Carter have testified, the PRBS, as practices, have been the nemesis of overall system development. Attempts at overlaying corporate management have simply run afoul of the legal foundations and core institutional traditions of the Department. Therefore, a consolidation of budget and programming authority within a single agency is recommended, as was proposed by a Defense Science Board Task Force in 1978.

Regarding political consensus, which probably is necessary to implement the change just noted, the most encouraging development in recent years was of course the President's declaration in October 1981 that C3I modernization would henceforth take precedence over other strategic programs. This represented something of a watershed and hope was raised further when the Stowcraft Commission issued its report urging that C3I modernization continue to have the highest priority.

But if the President's words laid the groundwork for shifting the focus of long-term concerns, it still fell to others to drive the wedge into established policy. And that hasn't been accomplished. Despite several years of relative prominence, the command problem still hasn't been vested with the policy significance it deserves. And we are nowhere near galvanizing the broad spectrum of groups whose support is essential to progress.

Fissures exist within the Pentagon itself. Factors that militate against consensus include a tension between competing principles of stability, between approaches to assessing nuclear capability, between demands for C3I survivability versus endurance, and between advocates of enhanced firepower versus improved C3I.

If consensus on behalf of C3I modernization can be mustered within DOD, C3I advocates still face the uphill battle for domestic consensus. The general public, among others, and the C3I community are barely acquainted. While the latter--C3I advocates--concern themselves substantively with weaknesses in positive control—that is, vulnerabilities and other deficiencies that undermine the ability of the United States to alert itself to impending or actual attack, to take necessary protective measures, and to effectively prosecute a nuclear campaign--the public harbors fears of a catastrophic failure of negative control—that is, a breakdown
of safeguards against accidental or unauthorized weapons release. The threat of inadvertent nuclear war produced by human or computer error, false alarms, or willful acts by those entrusted with custody of nuclear weapons, has been firmly planted in the public psyche. And although these worries are largely unjustified, they are not entirely baseless; after all, safeguards cannot be perfect.

Our brief for command modernization ought to be permeable to such concerns. We should recognize and acknowledge that the demands of positive and negative control are not fully compatible in practical terms, and the public should have reasons to feel confident that our controls are being designed to minimize the risks in both dimensions.

Congress needs similar assurances. Needless to say, it is a powerful vehicle of public concern over matters such as negative control. It comes as no surprise to find that the most widely cited congressional reports on nuclear command-control issued during the past ten years mainly delved into the question of negative control. It may come as a surprise to discover that congressional interest in command-control is in fact wide-ranging and well-healed. Significant expertise now resides within committee staffs, the Congressional Budget Office, Office of Technology Assessment, and General Accounting Office.

Advocacy on behalf of C3I modernization receives mixed reviews from another quarter whose verdicts carry significant weight in policymaking arenas: academia. Among the various schools of thought, there exists one, now flourishing, where command-control issues overshadow matters of force structure. Here, the traditional principle of stability, which emphasizes invulnerable forces, is definitely yielding to the broader conception that sees C3I performance as the key determinant of real nuclear capability. In fact, scholars of this persuasion first put forward the proposition that underlies our entire case: that if command and control fail, almost nothing else matters.

While certain academic views are converging on the C3I developer's, others diverge. For instance, many scholars attach a greater risk to the possibility that during a crisis, decentralized activities would aggregate to a point where they override rational decisions and produce inadvertent war. Whereas C3I developers emphasize strains on positive control, academics emphasize strains on negative control. Another difference of considerable consequence is the inclination of many scholars to associate C3I modernization with a doctrine of fighting and winning a nuclear war. Arguments for command endurance are thus commonly viewed with great suspicion as thinly veiled bids to prepare the C3I system to fight and prevail in a protracted nuclear conflict. The case for endurance, however, can and should rest squarely on other doctrinal premises that intersect the two communities.

The sticky wicket in the formulation and presentation of our brief for command modernization is the high level of security classification that we are forced to wrap around the subject. This is a severe handicap. Forging the broad consensus necessary to implement any nuclear policy normally requires a forum for meaningful discourse. The dilemma for this topic is that its sensitivity dictates a high degree of secrecy, and that massively dilutes the dialogue. The flow of information, the exchange of ideas, the clash of perspectives and the rest are severely restricted. As a consequence, informed consensus seems a remote prospect.

This unavoidable imposition means that the consensus necessary to vest command modernization with the policy significance it warrants will rest to a considerable extent on faith. How this can be managed in a political climate hardly conducive to inspiring trust is anyone's guess. All the more reason why we ought to pause to reflect on our aims, methods, and responsibilities in this matter of consensus-building.
Turning finally to the third recommendation, which is to adopt a strategy and command system that could relieve pressures on decisionmakers to authorize retaliation before they could possibly have a chance to comprehend what’s happening and rationally formulate a response. If deterrence of Soviet strategic attack would some day fail (and C3I weaknesses can only increase this risk), then surely the situation would demand urgent but deliberate, informed reconsideration by national leaders of the American national security interest and of the proper role of nuclear weapons in serving it, forcing decisionmakers to decide such matters in a few minutes, or even hours, only diminishes the roles and responsibilities of national leaders in a time of great national emergency. A consensus on this goal is of course a long way off, given, among other things, the really frightful financial burden that such a structure would carry. But I believe this consensus is the most essential of all. And further, I believe it is very compatible with the traditional second-strike principles that emphasize the importance of being able to respond to an attack in a careful, deliberate manner. These principles have long been familiar to and accepted by the Congress, the press, academia and the attentive public.

Mr. Brookes. Do the weaknesses in our command and control system undermine our ability to avoid accidental nuclear warfare?

Mr. Blair. Command and control weaknesses have played a part in putting our forces on hair trigger, and a hair trigger is inherently dangerous in these terms, I believe.

It is a very difficult question to answer, in part because there is a lack of historical evidence to support claims one way or the other. But on the face of it, it seems too much has to happen too fast for anyone to believe that there is not a significant risk of some making a very tremendous mistake in causing or aggravating a nuclear conflict.

Mr. Brookes. Why are you so critical of DOD’s current plans for heavy investment in the MILSTAR satellite program?

Mr. Blair. MILSTAR is a multipurpose satellite system that supports numerous users, tactical and strategic that may or may not be defensible on the tactical side. I have not looked at that.

But its potential contribution on the strategic side does not appear to me to justify its high cost for two basic reasons. One, it is very, very expensive, and at a time of significant cost pressure on command and control modernization, in my opinion, it threatens to drain resources from other promising programs that in the aggregate would offer a good deal more improvement than the MILSTAR system alone.

The second is that I am not convinced that MILSTAR, which must have been designed 2 or 3 years ago approximately, would be able to cope with the kind of antisatellite threat that the Soviets could mount during the timeframe in which MILSTAR becomes operational and becomes the backbone of our communication system. That is roughly the mid-1990’s and beyond. I don’t think anyone can project a threat that far ahead, but we certainly can say that there is no serious prospect of an arms control treaty at the moment that would restrict Soviet development of antisatellite weapons that can reach high altitudes, and as a matter of fact, I think we can project an intensified competition in space which raises further concerns about MILSTAR’s vulnerability in the mid- to-late 1990’s.

Mr. Brookes. Dr. Blair, you have had an opportunity to review DOD’s sanitized version of your report. They cut a lot of things out that they didn’t think we should read. Would you give us an unclassified assessment of what DOD censored?

Mr. Blair. I have had a chance to briefly look through the document in its sanitized form and the material deleted in general relates to aspects of Presidential decisionmaking that bear on single integrated operational plan selection, consideration, and dissemination.

There were other deletions that would inform the reader, had they remained, of some of the ways that the Pentagon has in the last 5 years devised backups to compensate for various threats of decapitation.

So, in general, the deletions have to do with the question of Presidential authority, how that operates, and also what the time lines of decision are, particularly with respect to Minuteman launch on warning, launch under attack, and some details of the single integrated operational plan that bear on Presidential control.
Mr. Brooks. Thank you.

Mr. Horton.

Mr. Horton. Thank you, Mr. Chairman.

Dr. Blair, thank you for your thorough and sobering assessment. The difficulty— as you describe it, the possible launch-on-warning situation— seems to apply particularly in the case of a Soviet surprise attack. What in your judgment is the likelihood of such an attack launched without prior U.S. intelligence?

Mr. Blair. That depends on how you define “surprise.” Richard Betts wrote a fascinating treatise in which it becomes increasingly clear that the definition of “surprise” is not a simple one. Was Pearl Harbor a surprise? Well, yes, it came as a surprise but there certainly was ample intelligence available in advance that warned of the attack on Pearl Harbor and had that information been filtered and circulated to the proper users, there is a good chance Pearl Harbor may have been avoided.

There are all sorts of gradations of gray, and white, that—

Mr. Horton. Is it possible they could have an attack without us having information about it?

Mr. Blair. Sure it is.

Mr. Horton. What?

Mr. Blair. Sure it is.

Mr. Horton. It is.

Mr. Blair. Just as it is possible that we could mount an attack today without the Soviet Union knowing very much about it in advance, though certainly there are some potential areas in which security might allow news of that attack to get out.

Mr. Horton. If the Soviet Union went through that process, yet we had no prior intelligence, isn’t it likely that the attack would not be large enough to accomplish a decapitation of our U.S. command?

Mr. Blair. The primary threat of decapitation today consists of those four, five, six, or maybe seven Yankee class submarines and more recently in a case of two Delta class submarines deployed routinely off our coasts. They are deployed on a day-to-day basis. That threat would not change if we had several days notice because there would not be more submarines deployed off our coasts several days after we receive strategic warning. So that is a constant, basically constant threat. The main problem is that missiles fired by submarines off the coast can have flight times as short as 5, 6, 7 minutes to Washington, and that is simply, in my judgment, insufficient time really to be able to perform the functions necessary to launch forces on warning.

Mr. Horton. In your judgment, would the DOD’s measures for added redundancy in the C3 systems minimize the possibility of attack being attempted?

Mr. Blair. Did you say the programs under development?

Mr. Horton. I say with DOD’s measures for added redundancy to the C3 system, would that tend to minimize the possibility of an attack?

Mr. Blair. Of a decapitation attack?

Mr. Horton. Yes.

Mr. Blair. Well, the time line here is inherent. Seven minutes to Washington is inherent, and the most difficult problem as I noted in my opening statement is that one simply cannot assure the survival of the national command authorities, or at least the President and his legal successor as defined by the Succession Act of 1947. Nothing is going to alter that fact, short of altering our form of government.

But in terms of the impact of the Pentagon’s command, control, communications intelligence modernization effort on confidence in the performance of our command system, with respect to any and all of the functions and strategies, I have to say that I think that it is worthy of very strong support. I think in many cases the lack of support for these programs comes from within the Pentagon, from within the Department of Defense. So my concern is, on balance, that we be very careful to be sure that those programs stay in the budget.

There are a couple exceptions. I mentioned reservations about MILSTAR. But in general, I strongly support virtually all the programs in the budget. However, I do think that a great deal more could be done and ought to be done and that we can afford as a nation to spend what is necessary to provide adequate redundancy in the system.

I do, however, just if I may add one last comment on that, I do think we need to shift more resources and investment into the warning area and take it out of the communications area, because as I have said in my statement, we rely so heavily on the initial warning and we are going to rely on it even more heavily in the future as new threats like the cruise missile come into being. We don’t have anything on the drawing boards to my knowledge that provides any kind of high confidence detection of cruise missile attack on the United States over the next 5 years roughly.

Furthermore, I think NORAD or whatever it is called now, ought to be able to tap into this Nation’s rather large and redundant strategic intelligence network, CIA, NSA, DIA, and all the rest, and that it ought to become a fusion center for strategic and tactical warning, given the really paramount importance of NORAD’s responsibilities.

At the moment NORAD, I think, is geared too much to tactical warning, that is detection of an actual attack, and is not integrated well enough into the strategic intelligence arena that might warn of an impending attack and prevent the surprise you referred to in your opening question.

Mr. Horton. In your statement on page 8 you point to the management structures and you make some basic criticism of management structures there. You also support consolidation of the budget programming authority within a single agency as proposed by the Defense Science Board Task Force in 1978.

Why do you feel that that is so important?

Mr. Blair. Well, because historically command and control systems integration has not been very successful. It is a unique problem. The technologies and procedures, which here relate to some of the comments we hear recently about JCS reform, the technologies and procedures really do require strong corporate top down oversight and the Defense Department simply is not structured to provide that kind of management guidance.
I am amazed frankly at how well this administration and past administrations have done given this highly fragmented diffuse bottom up system of procurement that is in place in the Pentagon.

Mr. Horton. Your recommendations for achieving crisis stability depend not so much on the command and control modernization as they do on changes in U.S. policy for employment of nuclear weapons. You propose a policy of avoiding any immediate response to an attack so that the process of directing nuclear retaliation could be more deliberate, would be relieved from the pressures of the so-called hair trigger.

Would changing to a policy of that sort make C3 assets any less attractive as targets for an attacker?

Mr. Blair. Well, if you assume that you are devising a command system that is able to endure for long periods of time in order to support that strategy of delayed retaliation, obviously you have to develop and deploy command systems that can survive or be reconstituted.

So, they certainly may continue to be prime targets but by definition, the argument says that we can and will develop survivable and enduring command systems. Let me add that this doctrine sounds a bit radical but in truth, the current doctrine of flexible response and controlled escalation for protracted conflict is no less radical in the sense that it requires a huge investment in command and control as well as in logistics and intelligence and so on for endurance and reconstitution and all the rest. What I am proposing in fact in many ways resembles that, but my argument is that the purpose of it is to provide decisionmakers with the option, not the necessity or requirement, but the option to ride out an attack and to determine what response best serves the security and the future of the United States.

I am talking about national leadership in the aftermath of an attack. That option used to exist, particularly given the fact that adequate information is simply not going to be available to them in the early minutes of an attack.

Mr. Horton. Of course the present system is not limited to that premise. I am intrigued with your point with regard to that doctrine. But how do you feel that could be implemented?

Mr. Blair. Well, I——

Mr. Horton. At the present time I understand that there is an option of immediate response. If we rely more heavily on a doctrine similar to what you are talking about, how will that tend to provide our deterrent?

Mr. Blair. Well, I think the timing of retaliation is more important for deterrence—I am sorry, the certainty of retaliation is more important for deterrence than is its timing, so if the Soviets know they can hit not only during the first 20 minutes of an attack on us but that in fact for any period in the next week or 10 days or 6 months they can get hit because the President and the surviving leadership of this country have after careful consideration decided that nuclear weapons have a very strong role to play in pursuit of our reformulated security interests, if they know that that can happen, that is a much more powerful deterrent than to have a system that depends on a hair trigger response.

A hair trigger is not only dangerous; it may not work when it should. There are serious questions that have to be raised about whether in fact launch on warning can be pulled off.

Mr. Horton. The question then comes up about survivability in order to launch that retaliatory action at a later date. A week, 2 weeks, whatever. How do you account for that? In other words, in your doctrine how do you provide for that survivability?

Mr. Blair. It requires an architecture, it requires a program, and a fair amount of money. Some of the groundwork for this has been laid by the current administration's program for ground mobile command centers and other enduring assets. Some of the forces already possess inherent endurance and survivability, such as the submarine force, which can endure 90 days normally or 120 days in dire circumstances. Furthermore, we have at least the basis of a political consensus behind this notion because after all, this has been sort of the underlying premise of U.S. nuclear doctrine since the early 1960's in the sense that at least our declaratory doctrine which most people were exposed to and came to understand and appreciate and accept, said we would be able to ride out the Soviet maximum attack, in fact even a greater-than-expected attack, and would be able to respond in a careful, deliberate fashion, and to do what is necessary to thwart the Soviet Union and to pursue our national interests.

So, in a way, what I am proposing is in fact just a reiteration of the basic thought behind our declaratory doctrine of the 1960's and beyond.

Mr. Horton. Well, if you considered that doctrine and if that doctrine were adopted, would you still continue to provide the same type of early warning system that we have now with NORAD, et cetera?

Mr. Blair. Yes, except that NORAD would not have to tell the President, or whoever the nuclear release authority is, what this attack is going to look like, what it means, in 5 or 10 or 15 minutes. Which means that you would naturally devise a somewhat different looking system. You wouldn't have attack assessment, for example, concentrated in vulnerable radar sensors. You put more emphasis on post-attack reconnaissance and intelligence. ION, the space-based nuclear detection system currently being deployed and soon to be operational, is much better aligned with the idea that I espouse for giving NORAD and the space command responsibility and commensurate capability for strike assessment, post-attack assessment. It would be some reconfiguration of the warning system, mainly to reflect this removal of the pressure on NORAD to immediately tell the President what the attack looks like, after all even today NORAD's briefing is just in many respects just guesswork.

So why force a lot of guesswork in the early minutes of an attack? Our tactical warning system is far more inferential than people realize. We don't count warheads and track their destinations. We guess at them essentially on the basis of peacetime intelligence gathering, which indicates which kind of missile carries how many warheads and so on, and what their accuracy is.

So I am saying, look, we found this attack assessment a very, very difficult task to do and there is reason to believe that we
would be better off shifting the objective from providing full-up, comprehensive attack assessment to the President in the first 5 minutes, to one that allows more time.

After all, no President could absorb it in that amount of time.

Mr. Hortis. Thank you very much, Dr. Blair. Thank you.

Mr. Brooks. Thank you very much, Mr. Hortis.

Dr. Blair, thank you for your participation and your testimony.

Next we have Charles Bowsher, Comptroller General of the United States. He is accompanied by Warren G. Reed, Director of the Information Management and Technology Division, and Dr. Carl R. Palmer, Associate Director for Defense and Aeronautic Mission Systems, Information Management and Technology Division.

We appreciate your being here. You may proceed as you see fit.

We are delighted to see you and we appreciate your contribution to this hearing.

STATEMENT OF CHARLES A. BOWSHER, COMPTROLLER GENERAL OF THE UNITED STATES, U.S. GENERAL ACCOUNTING OFFICE, ACCOMPANIED BY WARREN G. REED, DIRECTOR, INFORMATION MANAGEMENT AND TECHNOLOGY DIVISION; CARL R. PALMER, ASSOCIATE DIRECTOR FOR DEFENSE AND AERONAUTIC MISSION SYSTEMS, INFORMATION MANAGEMENT AND TECHNOLOGY DIVISION; AND THOMAS D. ROBINSON, GROUP DIRECTOR FOR DEFENSE C3I SYSTEMS

Mr. Bowsher. Thank you very much, Mr. Chairman, and members of the subcommittee. I am pleased to be here today to discuss the tactical warning/attack assessment [TW/AA] system. This system is intended to provide our leaders with timely, unambiguous warning in the event of a missile or atmospheric attack and to provide information concerning the size and intent of such an attack so that a determination can be made of the most appropriate response. TW/AA system performance is critical to our National Command Authority's [NCA] strategic decisionmaking, force survivability, and assurance of retaliation.

In 1981, the President decided on a comprehensive program for revitalizing our strategic nuclear deterrence. The highest priority was placed on improving the strategic command, control and communications [C3] systems, including developing survivable systems that would, under all circumstances, detect, identify, and report a nuclear attack.

The Assistant Secretary of Defense for C3I has testified to the Congress that “the strategic C3I systems must of itself be absolutely credible.” The TW/AA system is a critical part of the strategic C3I system. Billions of dollars are being spent on the TW/AA system.

Some problems will be corrected, but system deficiencies will remain.

Mr. Chairman, we will be reporting to you in a closed session the preliminary results of our assessment of the TW/AA system.

In that assessment we raise concerns about the system's effectiveness, especially for certain situations. Our classified statement will track closely the specific questions you addressed in your letter to us. In responding to your questions, we have examined a wide range of possible attack strategies as a basis for conducting our assessment of the TW/AA system.

In our assessment of the current and modernized system, we identify deficiencies associated with various subsystems that make up the TW/AA system but also try to relate the composite effects of those deficiencies on the overall system and its ability to support the National Command Authority decision mechanisms.

Although we will not be prepared today to provide specific recommendations regarding existing investment strategies, we will do our best to highlight areas where we believe progress is being made, as well as areas where we are concerned about the soundness and pace of progress being made. For this statement I would like to elaborate to some extent on some computer aspects of our assessment to give you a better flavor of our overall assessment and because I know it is an area you have indicated an interest in during earlier hearings.

I am sure you recall that we testified before your committee on May 19, 1981. When you hear the results of our preliminary assessment, you will note some similarity between the general state of affairs today and those reported 4 years ago. At that time, several false warnings had triggered this same system and our forces came uncomfortably close to premature reactions.

After these incidents, legions of experts from within and outside DOD descended on NORAD and the TW/AA system to find causes and solutions. The problems were a malfunction of a 40-cent hardware and logic test procedures. But from the analysis of what went wrong, which was the focus of your 1981 hearing, management changes and eventually a fix to the 40-cent chip and test procedures and facility problem at a cost of over $16 million.

The most rigorous top down system analysis and evaluation, that perhaps afforded any of our systems, were conducted and plans for modernization were made that have even the system architecture that has evolved to date.

I believe you may also recall that allegations were made at that time that actual causes of failure to detect the false alarms were known, that in some cases, the NCA may have been made more difficult by the detection system. The Brooks Act might have been contributing factors. I believe we have evidence that the TW/AA system was under serious doubt and the same time identified and reiterated some serious deficiencies with the TW/AA computer systems and management.

DOD, at that time, stated that it was taking steps to replace the systems, and in 1982 they reported to the House Armed Services Committee that the computer systems would be replaced by 1987. This specific case is in point of the similarity I alluded to earlier between today's situation and 1981.

In our current assessment, we have identified problems, such as the ADP problem cited, as well as others. But, once again DOD is faced with an interim noncompetitive ADP acquisition while the primary command centers await for system replacements in 1989.

Again, many of these problems are acknowledged by DOD but they have plans on the drawing boards for their resolution.

I would like to bring you up to date on developments in the computer area. To set the stage you will recall that primary command centers—NORAD Cheyenne Mountain com-