Trends toward Crisis Instability: Increasing the Danger of Nuclear War

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INTRODUCTION

The mind resists accepting nuclear war as remotely possible in any way except as the product of a monstrous accident or a demented leadership. Under what imaginable conditions might thoughtful policy makers in the United States or the Soviet Union reason that they have no real choice but to order the use of their strategic arsenal against the other side? Leaders in each country have stated repeatedly that both sides would experience enormous, unacceptable destruction in such an event. Time and again they have said no objective of national policy could be realized through nuclear war.

Yet we must not dismiss the possibility that under some circumstances—perhaps most likely in a crisis in Europe or the Third World in which either the Soviet Union or the United States believes the other has violated its vital interests—the fear arises that this time the problem will not be resolved without war. Then the policy makers must ask themselves, if major war is inevitable, would we be vastly better off by being the first to use strategic nuclear weapons rather than by allowing our enemy to do so? Suppose their conclusion is yes, that the side that strikes first could have a decided advantage and that its people just possibly might suffer significantly less.

Thoughtful policy makers could be expected to reject that conclusion initially. (What does it mean to "suffer less" in a nuclear war?

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What if the assumptions of an advantage in going first are mistaken? Suppose the parties can yet get out of the situation honorably without war?) If the crisis intensifies, any hope of avoiding war may sharply decline. Under such circumstances, high-level policy makers may find themselves reasoning as follows: Surely the other side has made the same calculations about the possible advantages of a first strike. Our trusted advisers report that our intelligence warns of preparations on the other side enabling them to launch a massive nuclear attack very quickly. The advisers repeat that all the calculations indicate a definite advantage to the side first using nuclear weapons against key targets. They urge that the enemy not be given this chance. The decision must be made at once.

Policy makers in such a situation have become immersed in the ultimate crisis of the nuclear era. International politico-military crises involving the United States or its allies confronting the Soviet Union or its allies have been a recurring characteristic of the forty some years since World War II. Perhaps, as Kenneth Waltz has suggested, such crises result partially from the bipolar structure of the international system.[1] Although in some respects, such as in economic relations, the world today is more pluralistic, the military alignment in international politics substantially continues the bipolarity that Waltz speculated might result in more crises and fewer wars among the major powers than a balance-of-power configuration. Nuclear weapons or the nature of the antagonists may also contribute to the caution that has resulted in frequent crises, but relatively fewer overt hostilities, between the superpowers. For whatever reason, crises, not superpower wars, have characterized Soviet-U.S. competition.

Embedded in every superpower confrontation exists the possibility that somehow things might escalate or get out of control, thereby resulting in the ultimate crisis. The conventional wisdom, at least among most Western analysts, is that the likelihood of policy makers either in the United States or in the Soviet Union actually using nuclear weapons is exceedingly remote. Many observers believe that the use of nuclear weapons is more likely to result from their proliferation to other countries or their acquisition by terrorist groups. Such subjective estimates often cite the cautious and conservative decision making about nuclear weapons among the leaders in both Washington and Moscow and their accumulated experience in both crisis and weapons management. Nevertheless there is reason for concern about crisis stability as it affects the use of nuclear weapons by the Soviet Union and the United States.

Crisis stability can be understood as a special subset of the more general phenomena of deterrence stability.[2] When both sides know that

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Crisis stability refers to the ability of a deterrent force to preserve its necessary requirements for effective retaliation under the adverse conditions that frequently arise in an international political crisis. In crises, more frequently than in normal situations, circumstances can arise that disrupt such essential features as the valid assessment of the current situation, force survivability, and decision controllability. Fear of the disruption or loss of such features may increase the perceived advantages of a preemptive strike. Any aspect of a crisis that increases the temptation to use nuclear weapons, beyond that existing in a normal deterrent condition, contributes to crisis instability.

It should be apparent that crisis stability concerns the relationship between weapons, strategy, and the policy makers who must decide on their use and who must activate the weapons and associated personnel according to a plan. Crises normally do not alter strategic weapons systems directly. They can, however, affect the conditions under which political and military leaders assess those systems, their performance, and the plans for their use. In short, crisis stability primarily concerns momentary situational changes that affect the calculations of the human component of deterrence stability.

Although the debate over exactly what constitutes an international crisis continues, sufficient consensus exists to identify a class of international activities as crises. From the point of view of the policy makers in a country, we can say that an international politico-military crisis exists when they perceive a severe threat to the basic values of the political system from sources at least partially outside their polity; when they believe there is relatively short time before the situation, if unaltered, will evolve in a way unfavorable to them; and when they have an increased expectation of military hostilities or a sharp escalation if some hostilities already exist.[3]

For some time, analysts have discussed whether crises typically reduce the quality of decision making and, therefore, necessarily reduce deterrence stability.[4] Although no one can offer a definitive response to this issue, a strong argument can be made that as a class of situations, crises can simultaneously generate both positive and negative features with respect to decision making quality. On the one hand, crises can focus and hold the attention of authoritative policy makers who otherwise cannot afford to concentrate on a single issue for long; they can establish circumstances under which stultifying

bureaucratic procedures are overcome and domestic obstacles eliminated so that resources can more readily be mobilized; and some individuals—particularly in the early stages—may find their energy increased and their imagination stimulated by the challenge. On the other hand, crises may trigger disruptive psychological and physiological stress in individuals. They may produce such unfamiliar conditions and increases in uncertainty about information and the actions of others that a severe imbalance arises between the actors' capabilities and the requirements for coping with the problem, with a resulting substantial increase in perceived task complexity; at times secrecy and the need for swift action may shunt off from policy makers available sources of information or analysis. Pressures of group dynamics, distorted by an "us-them" orientation, may cause policy makers to miss or forgo careful examination of dissenting perspectives, double checks on information and analysis reliability, or complicated and time-consuming analyses and proposals. In sum, whether the overall effects of crises are positive or negative may depend on a number of factors, such as the personal qualities of the individuals involved, how they are organized, and the resources available to them.

But to say that the decision-making effects of crises as a general class are ambiguous or conditional must not permit us to overlook the possibility that with respect to strategic deterrence the context for decision making in crises may be changing. In fact, it is precisely that point that is the thesis of this chapter: the superpowers continue to engage in a variety of activities that reduce crisis stability. This changing context makes it increasingly more difficult to maintain deterrence stability in future crises and thus increases the likelihood of war.

CONDITIONS FOR CRISIS STABILITY

Earlier we alluded to three conditions for maintaining deterrence stability in a crisis—valid assessment, force survivability, and decision controllability. The first of these conditions, valid assessment, concerns the ability of those who operate the deterrence system to determine accurately whether or not the defended polity and its forces are under attack or face momentary attack—and if so from what source. Accidental nuclear war haunts policy makers in the nuclear age. Failure of warning systems or incorrect attribution of nuclear detonations to a particular adversary could lead to the incalculable tragedy of launching strategic forces when no appropriate provocation occurred. Equally critical for the maintenance of a credible deterrence is the necessity that a warning system will promptly identify any true assault. For crisis stability the question must be posed: Have the superpowers

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Force survivability entails the well-understood requirement of any second-strike capability to be able to withstand an adversary's initial attack undertaken in circumstances most favorable to the aggressor. A sufficient portion of the deterrent force must be expected by both sides to have a high probability of surviving and then to be capable of inflicting a retaliatory strike or strikes producing on the aggressor unacceptable damage—at whatever that level of damage is understood to be. The general question to be asked is whether changes have been introduced such that in a crisis the policy makers have reduced confidence in the survivability of a significant portion of their strategic systems.

It is tempting to characterize the requirements of controllability in terms of the frequently used concept of command and control (about which more will be said later). Certainly command and control constitute a significant part of what must be examined, but there is more. Control must entail the human process of decision making—of engaging in analytical choice processes—that produces the commands and results in the exercise of control. The growing attention to command and control introduces numerous critical issues about the physical properties and operation of strategic systems.[5] These concerns must be complemented, however, by attention to the environment for human decision making under which command and control is to be exercised. Some may regard it as absurd to consider the quality of the decision-making environment in which policy makers engage in decisions about the use of strategic weapons. Yet no one would willingly want to create conditions that compounded the difficulty of engaging in decision making about nuclear weapons use. But have we done so? In a future crisis would policy makers have time to check the accuracy of information, to obtain multiple assessments of its meaning, to review options or invent new ones? Would they face indescribable pressure for action or delegation of authority? Would the intended organizational procedures compound their concerns about their future abilities for exercising control?

To answer these questions we must review recent and emerging developments and practices—many of them quite familiar—that affect the context in which any future crisis involving the Soviet Union and the United States would occur. At least four areas require review. They are changes in the characteristics of strategic weapons, changes in the strategic alerts, changes in command and control of nuclear weapons, and changes in strategic plans. Clearly there are connections between these developments, but with respect to crisis stability, each can be viewed as producing some separate effects.

WEAPONS SYSTEMS CHARACTERISTICS

It is hardly a new idea to suggest that characteristics of weapons systems have an impact on the process by which policy makers decide on their use or nonuse. Thus, the shift from liquid fuel rockets, which may take hours to prepare, to solid fuel rockets, which are ready for almost immediate launch, may force a different set of decision requirements on policy makers. Both the superpowers have engaged in a more or less continuous upgrading and modernization of their strategic forces. The changes in the inventory of strategic weapons of greatest salience to crisis stability might reasonably be said to have begun with the U.S. deployment in the early 1970s of Multiple Independently Targetable Reentry Vehicles (MIRVs), which are now deployed by both sides in sufficient numbers and are combined with substantial improvements in warhead accuracy to pose a threat to the survivability of fixed-base intercontinental ballistic missiles (ICBMs). The resulting hard-target kill capability, or ability to destroy with substantial probability hardened missile silos, has put a major portion of each side's strategic force at risk from the other side's possible first strike. This problem has been widely discussed and can be presumed to be well understood by responsible authorities on both sides. In fact, the most troubling consequences for crisis decision making of the assumed increased risk to ICBMs as well as bomber bases may be the steps taken in both countries to remedy the difficulty. (This will be discussed below.)

Even without these second-order effects, MIRVed accurate systems such as the Minuteman IIIs, MX, SS-18s, and SS-19s will produce a pressure, greater than in early post-World War II crises, for preemptive attack if the likelihood of nuclear war seems pronounced. Because both sides have ICBMs at risk, each will be attempting to calculate whether the other side may be planning to preempt. As a result, there will be an increased tendency to interpret any ambiguous military activities as indications of preemption, which in turn could trigger decisions to use one's own weapons before they are destroyed.

Both sides have become highly dependent upon a variety of satellite systems for command, control, communications, and intelligence (C^3I) for their strategic systems. Among other purposes, satellites provide warnings of immediate preparations for the use of large numbers of strategic weapons and the earliest indications of actual rocket launches (initially from the detection of the substantial infrared radiation emitted during a missile's boost phase). Satellites also are critical for navigation of the strategic forces. The Soviet Union has led the way in the development of antisatellite (ASAT) rockets designed to destroy satellites in space. Just as the Soviet Union followed the United States in MIRV development, so the United States has followed the Soviet Union's initiative in the pursuit of an ASAT system.

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Antisatellite capability on both sides appears unperfected at present. Even if improved, the present generation of such weapons would appear to threaten only low-orbit satellites or those in highly elliptical orbits, called Molniya orbits. Most U.S. strategic satellites are stationed in very high orbit, although the Soviet Union is reported to have its early warning satellites in highly elliptical orbits. Both countries, however, maintain numerous low-orbit military satellites of great importance for intelligence purposes, and these systems could be vulnerable in the near future. According to Richard Garwin and his coauthors: "The ability to destroy low-orbit military satellites, coupled with the fear that the opponent may at any moment attack one's own satellites, could therefore create an irresistible temptation to remove the opponent's satellites. As a consequence the ability to destroy low-orbit satellites promptly could inflame a political crisis or minor conflict that might otherwise have been resolved by diplomacy if there were no antisatellite weapons."[6] More vulnerable to immediate disruption—particularly in the West—are the small number of downlink receiving stations for key satellites and the lines by which their signals are relayed to policy makers. Sabotage, rather than high-technology ASAT, pose an increasingly recognized risk.

Clearly, the destruction of satellites at any time, and particularly during a crisis, would be regarded as a violation of existing treaties and an act of extreme provocation. Even without actual attacks, the knowledge of the existence of antisatellite weapons on both sides will compound tensions in a future crisis. The launch by the other side of new intelligence satellites during a crisis—a common practice—could be construed as masking the orbiting of antisatellite capability. Should one side experience the malfunction of one or more satellites during a crisis, its leaders might conclude that they have been victims of deliberate interference with their necessary capability for valid assessment of the current situation. The existence of a substantial antisatellite capability would be perceived as reducing stability in a crisis regardless of whether such weapons were used. Like land-based ICBMs in silos, satellites have become vulnerable, particularly those in low earth orbit. At the moment this particular destabilizing feature may be a greater threat to the Soviet Union than to the United States, although both face the problem.[7]

Optimally the momentous decision about the use of nuclear weapons should be taken under circumstances that promote thoughtful reflection and analysis. The magnitude of the consequences certainly separate this potential decision from all others. Yet both the United States and the Soviet Union push the development and deployment of weapons systems that continuously erode the available decision time. Current ICBMs take 25 to 30 minutes to reach most targets in the other country from their present sites. The time for dealing with the

ultimate crisis—whether and how to respond to information that such an attack is in progress—would, under the best of circumstances, be several minutes less, assuming the first evidence comes moments after the actual launch of such weapons. Both sides have available missile systems that reduce warning time to well under ten minutes by the use of submarine-launched ballistic missiles (SLBMs) that traverse much shorter distances from their location in offshore subs. Pershing IIs and, for European members of NATO, the SS-20s pose the equivalent decision-time-reducing systems.

The ultimate decision-time-reducer will be weapons designed to attack ICBMs or SLBMs in their boost phase. For the present generation of ICBMs, the boost phase begins when the main rocket engines start firing just before lift-off and ends when the final stage rocket engines shut off—an elasped time of three to five minutes. Both sides are currently working on systems designed to attack missiles in their boost phase. To destroy missiles (perhaps up to 1400 in a full-scale attack) in the boost phase, the defensive systems must identify rocket launches, track their flight paths, launch interceptor beams or projectiles, and assess what damage was done for possible second efforts—all within five minutes. Clearly no human decision making can be introduced into such a highly restricted time frame. In such circumstances, computers must determine whether a missile launch is only a test, a manned space mission, or a defective sensor. Its malfunction could not only precipitate a crisis but could also plunge opponents in an existing crisis into vastly greater escalation. Severe consequences could flow from the perception by policy makers that the other side intends to relinquish to an automated system control over the initiation of strategic defense—possibly involving the detonation of nuclear devices. If the adversary believed the system would work and believed during a crisis that war seemed increasingly inevitable, he would know that his first strategic move would have to be massively overwhelming. Furthermore, both sides would regard any evidence during a crisis of the defense system's malfunction as a period of acute opportunity or vulnerability.

In summary, the characteristics of recent and planned weapons systems adversely affect all three of the factors that are conditions for deterrence stability in a crisis—valid assessment, system survivability, and decision controllability. Both the United States and the Soviet Union have introduced weapons with these adverse implications. Although there are some discernible direct effects on crisis stability from these new weapons systems, the most significant consequences are the second- and third-order effects. To deal with these weapons, policy makers take other steps or form new mental images that, in turn, seriously reduce stability in a future crisis. It is important to recognize that every new strategic weapons system does not neces-

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STRATEGIC ALERTS IN AN ERA OF ESSENTIAL EQUIVALENCE

On three occasions since 1960, the United States has put its global military forces on an increased alert status during a crisis with the Soviet Union. These include the collapse of the summit conference in May 1960, the Cuban Missile crisis in October and November 1962, and the final days of the Middle East War in October 1973.[8] Not much comparable information appears to be publicly available regarding the Soviet Union. To date, however, it does seem that the United States and the USSR have not put their worldwide strategic forces on a high state of alert at the same time. The question is whether conditions now exist so that in a future crisis, simultaneous strategic alerts might be more likely. The basic military purpose of an increase in strategic-alert status is to heighten the preparedness for war by taking steps to reduce the time between a subsequent order to use force and the actual initiation of coordinated military action. At least, the United States has demonstrated its willingness to use a heightened alert status as a means of signaling to the other side quickly and dramatically its resolve to protect threatened vital interests. Clearly that was the intent of the U.S. alert during the Yom Kippur War: to signal rapidly that the United States would regard the introduction of Soviet troops into Egypt as contrary to U.S. vital interests.[9]

Whether the Soviet Union's leadership will elect to follow the U.S. precedent and use an increase in strategic-alert status as a means of signaling in a future crisis is unknowable, but the mutual preception of the increased size and relative capabilities of Soviet strategic forces, as compared with their size and capabilities in 1973, might invite such action. At a minimum, Soviet leaders may feel they can no longer allow the Americans to engage in such actions without a comparable response to curb bluffs and to communicate that they are equally prepared to defend their vital interests.

Beyond the use of strategic alerts as a signaling device, there is another reason for expecting mutual high strategic alerts in future crises. If both sides perceive the growing vulnerability of a significant portion of their strategic systems to the other's preemptive attack, then prudence compels one to move such forces to a higher state of preparedness when the likelihood of a major war seems to have suddenly increased.

If heightened strategic-alert status in some superpower crises

are expected, and perhaps necessary, that does not alter their implications for crisis stability, particularly if the escalated levels of strategic readiness are mutual. It is reasonable to assume that higher alert levels involve some weakening of centralized control over nuclear forces. The unavoidable dilemma between negative controls ("don't launch without confirmed authorization") and positive controls ("be certain to launch when orders are given") must inevitably shift in favor of positive controls under high-alert conditions. How might the shift in balance toward positive control happen in a crisis? After all, simply putting more bombers at the ends of runways or on airborne alert or sending more missile-carrying submarines to station at sea does not necessarily reduce the negative checks against launching an attack. The shift occurs in several ways. In an acute crisis the U.S. president (and perhaps his Soviet counterpart) could be expected to delegate authority to initiate use of nuclear weapons down the chain of command. This would be a necessary precaution against a possible enemy attempt to immobilize the strategic system by instantly killing the president, the secretary of defense, the chairman of the joint chiefs, and those in the constitutional chain of command with a very small number of nuclear weapons. In contrast to the normal peacetime disposition of managers of the strategic system to disbelieve and check repeatedly any information indicating an incoming attack, in a crisis such messages would be more credible. Because the nuclear use authority would be dispersed, more individuals would be in a position to make separate and independent judgments that this time the message is real. The problem would be most sensitive with submarines placed on a higher alert status, as submarines have no physical constraint on launching nuclear weapons outside the boats' crews themselves and outside communication while making maximum effort to avoid detection is difficult. Finally, each side's alert preparations would almost certainly be quickly detected by the other side. (Quick detection by the Soviets is precisely why the United States went to a higher level of strategic alert in 1973 to signal its resolve.) The temptation to respond to the other side's alert with a still higher state of one's own would feed not only the physical changes in the two systems but the psychological state of the respective, enlarged group of policy makers, each with a finger on the nuclear trigger.[10]

At higher alert levels in a crisis a greater danger arises that action will occur—either unauthorized action or actions with unanticipated effects—that will be misconstrued by the other side as moving beyond preparation to a commitment to attack. In the Cuban missile crisis, many such actions occurred. With mutual high alerts, the number and reduced tolerance of such events could be extremely troubling. Finally, simultaneous high levels of alert may complicate the task of orchestrating de-escalations back to lower alert conditions

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when such action by one side would appear to give the other decided advantages. In sum, mutual high alert status in a crisis affects decision controllability and, ironically, system vulnerability (which is what increased alert is designed to reduce).[11]

COMMAND AND CONTROL OF NUCLEAR WEAPONS

The command and control of nuclear weapons, or C^3I, have become the subject of increased attention in recent years for both policy makers and analysts. Among those who have addressed the issue, few have been more unequivocal about the danger to crisis stability of the highly vulnerable strategic command and control systems than Bruce Blair. He contends that while a great deal of discussion has been addressed to the increased vulnerability of land-based ballistic missiles, their current vulnerability is quite limited when compared with that of the command and control of nuclear forces:

> Crisis instability is more likely to stem from command system vulnerability. The condition of the U.S. command structure creates a potentially severe penalty for delay in releasing weapons and thus encourages early release by U.S. authorities. By the same token the creaky state of our command system offers Soviet leaders potentially great rewards for prompt action; the situation discourages indecision and late release by Soviet authorities. Command vulnerability not force vulnerability, then, is the main potential source of crisis instability.[12]

With respect to crisis stability, two command and control issues seem paramount:

- Elements of command and control remain one of the most vulnerable elements of the strategic system susceptible to a first strike.
- Highly centralized control of nuclear weapons by the highest national authority poses an exceptionally vulnerable target.

Command and Control Vulnerability

The general vulnerability of command and control results from numerous factors, ranging from the "softness" of many elements of the system (for example, satellite receiver stations, radars, and telephone lines) to the uncertain effects of nuclear detonations on the performance of electronic equipment and certain radio frequencies (for

example, the ability of the electromagnetic pulse, or EMP, from a high-altitude nuclear explosion to create harmful voltage surges over a wide area), and from the increased operational requirements as a result of adopting more complicated strategic plans to increased complexity resulting from the tighter integration of more components.

John Steinbruner relates results of a computer simulation performed by two colleagues on the hypothetical communication network for a squadron of fifty Minuteman II missiles and the implications when various links in the system are destroyed.[13] Despite the redundancy of communications built into the system, the simulation reveals substantial failures of both positive and negative controls, even under moderate damage when initial orders are changed. Of course, the model concerns only a small part of the system as it might perform under a limited set of hypothetical conditions. It suggests, however, the difficulty of sustaining control after some elements of the command and control system have been damaged and the potential problem of modifying plans after an attack.

As with so many of the consequences for crisis stability, the main effects appear to flow from the policy makers' awareness of the vulnerability and their efforts to cope with it. Because each side knows that key elements of the other side's command and control system can readily be disrupted by a modest force and that such an attack could offer a chance of prohibiting a substantial, effective counterattack, there is a temptation to consider a preemptive strike. This is particularly so knowing that one's own side might be made similarly inoperative by an equivalent assault. If war seems likely (which is what a crisis is about), the command and control system may become a factor, not for controlling the situation and promoting a resolution of the crisis, but a pressure for a preemptive nuclear attack.

> If war should ever appear unavoidable, military commanders on both sides charged with executing their assigned missions would inevitably seek authority to initiate an attack, whatever prior national security policy may have been. They would do so with a forcefulness that would depend directly on the intensity of the crisis. The pressures on political leaders at that point would be severe. Although there is no reason to doubt their continued desire to avoid war, there are strong reasons to doubt their ability to contain their respective strategic organizations.[14]

National Authority Vulnerability

Control of nuclear weapons by the highest national authorities has been a widely accepted principle since the beginning of the nuclear age.

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With the proliferation of strategic systems in geographically diverse locations, the problem of maintaining control has become more complex. In characterizing the evolution of the American system, Paul Bracken uses the analogy of a rifle trigger and safety catch combination in which the trigger is inoperative so long as the safety catch is on. "The primary command centers were to serve as triggers, but their ability to fire would be refrained by the viable functioning, and the survival, of the presidential command center. If the safety catch of the system were destroyed, direct operational control would devolve to the primary command centers."[15] Obviously, many steps have been taken to insure the accessibility of the president (or his successor) to the primary command centers; the constant proximity of the military aide with the authorizing codes and the standby maintenance of the National Emergency Airborne Command Post are examples of such precautions.

As with other parts of the command and control system, the centralized control—both the safety catch and the primary triggers—represent a fairly small number of targets. The Soviet Yankee class submarines off the Atlantic coast of the United States, the American Pershing II missiles in Europe, and nearby American Poseidon and Trident submarines all have missiles with flight times of under twelve minutes capable of destroying the high command centers. The time from the moment of detection of their launch to impact on their targets could in many circumstances be insufficient to remove the designated authorities to safety. In fact, the key subordinate commands also could be subject to similar prompt attacks, creating the specter of a society abruptly deprived of its top political and military leadership from a decapitation strike. (The evolution of such a possible strategy as a threat to crisis stability is discussed below.)

Once again the crisis stability problem is created by the increasing danger of the steps taken to cope with the command and control susceptibility to attack and the resulting perceptions. Bracken describes the U.S. system designed to meet this problem as one of "cascading authority," whereby through a practice of predelegated authority, the ability to authorize an attack is passed to consecutive lower levels of military command before an attack. Assuming higher levels of authority are lost, then by prearrangement these officers decide on the use of the weapons under their command. It is the knowledge that the higher authority may disappear suddenly that poses the direct danger of predelegated command to crisis stability.

> The reason that the Soviet Yankee submarines off the Atlantic coast or the Pershing 2 missiles in Europe are such intrinsically dangerous weapons is not the physical damage that they can do to the White House or the Kremlin. Rather,

> it is that each of these weapons injects ambiguity into the enemy command. The existence, not the use, of these weapons compels commanders to anticipate that their political high commands are not likely to survive more than five minutes in a nuclear war. . . . In a war, or even in an intense alert, the command will then see the smallest disruption or unusual action in this context.[16]

Once authority over the use of nuclear weapons has been predelegated in a crisis, how does one continuously and confidently insure designated commanders that higher authorities are still safe and retaining authority? After the crisis is over, how is authority firmly recovered? These are the kinds of problems posed for crisis stability by eroding decision control.

STRATEGIC PLANS

Not only the weapons, the means for their control, and the occasions on which readiness is suddenly accelerated, but also the prearranged plans for their use can affect crisis stability. Indeed, actual changes or perceived changes in these other factors often motivate changes in strategic war plans. The two current proposals with powerful implications for crisis stability appear to stem from analyses of changing characteristics in weapons and the increasingly recognized problems of command and control vulnerability. The two proposed plans are launch under attack and a preemptive decapitation strategy.

Launch under Attack

Launch under attack represents a possible response to the perceived growing vulnerability of land-based, fixed-site intercontinental ballistic missiles (ICBMs), whose protection through hardening appears to some to be overwhelmed by sufficient numbers of accurate, MIRVed warheads possessed by the other superpower. Such a strategy also offers greater assurance that retaliation can be implemented with an intact command and control system and thus represents a better chance for a coordinated and effective counterstrike. In addition, it recognizes that at the beginning of a nuclear exchange an opponent would act to disperse and otherwise protect moveable strategic systems such as bombers and submarines that were at their bases. These are time-urgent targets that one has the best chance of destroying by attacking quickly before they are moved. (An aggressor might be reluctant to move all these assets prior to his initial attack because it could reveal his intention.)[17]

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One would hope to acquire some advanced (or strategic) warning of an adversary's intention to use a substantial number of strategic weapons prior to their actual launch. Preparations necessary for a large-scale initiative should be evident from various monitoring systems, although efforts to mask such activity can be assumed. We have already seen that moving to a high-alert status in a crisis may be compelling as a precautionary step against being the victim of a surprise attack. Such mobilization could mask intentions to actually initiate a strike.

Thus, in a crisis, the possibility of strategic warning is uncertain, and such warning almost certainly would be ambiguous. It is only after information processing centers had interpreted signals from intelligence sensors of an attack under way that a tactical warning could be flashed to command centers. It might be the first seemingly clear indication in a crisis of the adversary's intent to use nuclear weapons. If one's own ICBM sites appear to be the probable targets of such an attack, the policy makers would face the much discussed problem of losing a substantial portion of their hard-target, quick-response strategic force in less than thirty minutes. The so-called use-'em-or-lose-'em decision would be posed. Ordering a launch of the targeted systems before they are destroyed by incoming warheads is the proposed plan for launch from under attack.

It should be obvious that if a coordinated and directed use of missiles is to succeed under such extreme conditions, a careful, detailed strategy for this contingency must be established in advance. Knowledge by an adversary that such a strategy is contemplated must have implications for its behavior in a severe crisis. If a launch-from-under-attack plan were to have any reasonable hope of success, it would require putting strategic forces on a high state of alert once an international crisis occurs. To minimize delay, launch procedures must be linked very closely to warning sensors. To insure that an enemy cannot prevent quick response by initially attacking the command and control system, other steps are required. It would probably be necessary to implement a predelegation of authority to use nuclear weapons, perhaps on some kind of fail-deadly plan.[18]

Such a hair-trigger strategy requires the tight integration of all parts of the strategic system. As Bracken has noted, "Tightly coupled systems are notorious for producing overcompensation effects."[19] Information in any part of the system gets repeated and amplified, and the costs of any verifications or checks that take more than a moment may insure the defeat of the time-urgent plan. The tendency in any launch-from-under-attack plan would be to switch off, under high conditions of alert, certain normal negative controls that might fatally delay its implementation.

Information processing under such conditions would likely appear

much different than it would in the same strategic command and control system under normal conditions or even in a crisis without a commitment to a launch-from-under-attack plan. Crisis stability would be sharply degraded as any real or false signals surged through the system. Not only the authorities in the country using such a plan but also their counterparts on the other side would be severely affected if they suspected that in a crisis their adversaries were committed to a launch-from-under-attack plan.

Preemptive Decapitation

Under the prevailing conditions of mutual deterrence, policy makers in both the Soviet Union and the United States both now and in the future are expected to conclude that no objectives or goals are remotely worth the horrors of nuclear war. Thus the balance of terror, no matter how despicable, enables us to avoid nuclear war. But in a crisis, would these same calculations prevail under the conditions in which, for example, one side believed the other had adopted a launch-from-under-attack policy? Or suppose the policy makers fully recognized and accepted the implications of the other circumstances described in this chapter. Might they still believe that nuclear war was not worth any of their goals but conclude that such a war now seemed extremely likely or perhaps inevitable? On such an occasion might leaders be tempted to implement a preemptive first strike against the most vulnerable element of the other side's strategic forces—the command and control system—in the belief that it offered a better chance of survival? It would be imperative to attack first with a preemptive strike that would be targeted not exclusively or even primarily against the strategic forces themselves, but against the political and military command centers, the strategic communication nodes, and the information processing centers that constitute the brain of the highly integrated force. Such targets appear to be well identified by both sides, and their numbers are small. According to Blair, "Half the 400 primary and secondary U.S. strategic C^3I targets could be struck by Soviet missile submarines on routine patrol."[20] Steinbruner makes a similar point:

> Fewer than 100 judiciously targeted nuclear weapons could so severely damage U.S. communications facilities and command centers that form the military chain of command that actions of individual weapons commanders could no longer be controlled or coordinated. . . . The loss of central coordination would . . . probably have even greater consequences for the operation of Soviet forces than it would for the United States.[21]

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Steinbruner suggests that a decapitation strike against the political and military nuclear command and control system offers several advantages. First, it is likely to reduce the damage of any retaliatory response because the response would lack controlled coordination. (Should retaliation be undertaken? When? Against what targets?) "Second, it offers some small chance that complete decapitation will occur and no retaliation will follow."[22] Thus such a plan identifies the opponent's most vulnerable link and could be perceived to offer one possible chance, if war cannot be avoided, of victory.

The consequences for crisis stability of a decapitation strategy are staggering. It imposes powerful incentives on both sides for a preemptive nuclear strike if, in a crisis, war is perceived to be nearly inescapable. It also greatly increases the likelihood of war by loss of control or miscalculated escalation.[23]

SUMMARY AND CONCLUSIONS

The thesis of this chapter is that both the United States and the Soviet Union have gradually engaged in a variety of activities that have seriously eroded the stability of their deterrence systems to withstand the effects of a direct international crisis without ending in war. Characteristics of certain weapons systems, configurations of command and control, practices of increasing the alert status of strategic forces, and potential strategic plans to deal with these developments will in times of crisis reduce the likelihood of valid assessment, increase system vulnerability, and decrease the ability of the policy makers to exercise control. It is not that a politico-military crisis must inevitably result in nuclear war, but that these developments have made that outcome more, rather than less, likely. Some observations with implications for improving crisis stability can be drawn from this analysis.

- Both the Soviet Union and the United States have contributed to the erosion of crisis stability and both would experience the increased pressures that would result in a future crisis; therefore, there is a symmetry to the problem. This condition should provide both sides with motivation to improve crisis stability.
- Proposals for improving crisis stability should be evaluated in terms of their impact on the factors contributing to reduced stability and their effects. In other words, we should ask how proposed improvements address the sources of the problem or the difficulties they create or both.
- The gradual reduction in crisis stability results from human activities that appear to have been initiated for various purposes unrelated

to maintaining crisis stability. Although it should be possible to reverse some of these effects in a gradual process, attention must be given to the other needs that both sides felt required the actions leading to the current situation.

- Assuming that political and military authorities in both countries eroded crisis stability inadvertently, there needs to be more explicit consideration of the effects on crisis management when considering future modifications in strategic forces and their planned operation.
- Under present circumstances it would appear critical that policy makers on both sides immediately become aware that the dynamics of a future crisis in which they might become involved would be different from and more volatile than some in the past—even recognizing that major power crises always have been extremely dangerous situations.

NOTES

1. Kenneth N. Waltz, "The Stability of a Bipolar World," Daedalus 93 (Summer 1964): 881-909.

2. On the relationship of deterrence or strategic stability and crisis stability, see Leon V. Sigal, "Warming to the Freeze," Foreign Policy 48 (Fall 1982): 54-65. Further discussion of crisis stability appears in Bruce G. Blair, Strategic Command and Control (Washington, D.C.: Brookings Institution, 1985).

3. For evidence in the movement toward consensus on a definition of crisis, at least from a decision-making perspective, compare Charles F. Hermann, ed., International Crises (New York: Free Press, 1972); Robert A. Young, ed., "A Special Issue on International Crisis," International Studies Quarterly 21 (March 1977): 3-248; and Michael Brecher, ed., Studies in Crises Behavior (New Brunswick, N.J.: Transaction Books, 1978). The definition of crisis used here is a variation on Brecher's modification of my own earlier efforts. I accept his introduction of the expectation of military hostilities as particularly appropriate for delimiting the class of problems to be examined in this chapter.

4. See Charles F. Hermann and Linda P. Brady, "Alternative Models of International Crisis Behavior," in International Crises, ed. Charles F. Hermann, 281-303, for an examination of the alternative models of crisis effects.

5. Paul Bracken, The Command and Control of Nuclear Weapons (New Haven, Conn.: Yale University Press, 1983); Blair, Strategic Command and Control; Ashton B. Carter, "The Command and Control of Nuclear War," Scientific American 252 (January 1985): 32-39; and Stephen J. Cimbala, "U.S.-Soviet Command Reciprocity: The Interde-

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6. Richard L. Garwin, K
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pendence of Survivable Leadership," Armed Forces and Society (forthcoming).

6. Richard L. Garwin, Kurt Gottfried, and Donald L. Hafner, "Anti-Satellite Weapons," Scientific American 250 (June 1984): 45-55.

7. Ashton B. Carter, in "Satellites and Anti-Satellites," International Security 10 (Spring 1986): 46-98, suggests that the ASAT threat to satellites may be exaggerated. The coordination and time required using ASATs to eliminate all active satellites of either country performing a certain function such as early warning, navigation, communication, or photoreconnaissance would be quite substantial. Some space missions may be more readily disrupted by means other than antisatellite missiles, such as attacking their ground communication stations, system-generated electromagnetic pulses from nuclear explosions in space, or ground-based directed energy weapons. Countermeasures against these and other attack modes may be possible and may still allow a satellite to perform some of its mission before being destroyed. Nevertheless, Carter concludes, "ASAT attack on some space missions is both tempting and relatively easy. Complex satellites in LEO [Low Earth Orbit] will probably remain fairly cheap to attack in relation to their cost, and if they are engaged in threatening military activities they will present an irresistible temptation for ASATs. . . . Covert ASATs and the possibility of breakout [from any future ban on ASATs] might be much less far-fetched in an ASAT treaty regime than in the ABM [antiballistic missile] treaty regime" (pp. 88-89). Thus, the problem for crisis stability would appear to be real.

8. See Scott D. Sagan, "Nuclear Alerts and Crisis Management," International Security 9 (Spring 1985): 99-139.

9. See Barry M. Blechman and Douglas M. Hart, "The Political Utility of Nuclear Weapons: The 1973 Middle East Crisis," International Security 7 (Summer 1982): 132-56; and Henry A. Kissinger, Years of Upheaval (Boston: Little, Brown, 1982), 579-87.

10. Richard N. Lebow, in Nuclear Crisis Management (Ithaca, N.Y.: Cornell University Press, forthcoming) envisions three broad ways in which a superpower crisis could result in war—preemption, miscalculated escalation, and loss of control. In his view, increased strategic alerts above normal levels represent a primary means by which the sides could lose control.

11. Several readers of an earlier version of this chapter correctly noted that there has been no trend toward increased use of strategic alerts; on the contrary, they have occurred less frequently: there have been none since 1973, despite incidents such as the invasion of Afghanistan or the Soviet shooting down of the Korean airliner. Perhaps there is increased sensitivity in the policy community to the implications of strategic alerts. The assumption of this chapter remains, however, that a higher level of strategic alert in the late 1980s would be far more

serious than in 1973 because of the changing nature of the force systems of the two sides and the greater likelihood that the expanded Soviet capability would make it more likely that they would respond with a higher alert level of their own.

12. Blair, Strategic Command and Control, 209.

13. John Steinbruner, "Launch under Attack," Scientific American 250 (January 1984): 37-47.

14. Ibid., 47.

15. Bracken, Command and Control, 196-97.

16. Ibid., 231.

17. A distinction should be made between launch under attack (LUA) and launch on warning (LOW). A launch-from-under-attack strategy would initiate retaliation only after evidence of the explosion of one or more nuclear weapons on or over U.S. territory. Launch-on-warning strategies involve beginning the retaliatory strike after receiving tactical warning of an incoming attack, that is, after sensors had detected the liftoff and flight trajectory of enemy missiles. Launch on warning presumably provides a few minutes more time but increases the risk that the information of an attack is in error. Lebow suggests that the distinction in practice might not be very great between the two strategies. Both, however, appear different from a preemptive strike, which could be initiated on the basis of strategic warning that an enemy is preparing to launch an attack and is generating its strategic forces (Lebow, Nuclear Crisis Management).

18. Bracken contrasts a fail-deadly command system with the more common fail-safe. In fail-safe systems, strategic weapons are not permitted to go beyond reversible commitment to attack without final authorization from the highest command authority. In fail-deadly systems, unless a coded signal is received from the highest authority at regular intervals, weapons are to be launched (Bracken, Command and Control, 299-330).

19. Bracken, Command and Control, 55.

20. Blair, Strategic Command and Control, 189.

21. John D. Steinbruner, "Nuclear Decapitation," Foreign Policy 45 (Winter 1981/82): 18-19.

22. Ibid., 19.

23. Lebow, Nuclear Crisis Management.

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Strategic surprise attack
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Like most disasters, it doesn'
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