Crisis Stability in Soviet-American Strategic Relations

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On September 25, 1987, former American secretaries of defense gathered In 11 public meeting in Atlanta, Georgia. Much of the session was devoted to nu\11•111 issues, arms control, and Soviet-American relations. A repeated theme ww the importance of crisis stability. The issue was put most dramatically by Kohl'1 I McNamara, who, when asked what advice he would give to the next president, rt•plil•d: "Push ahead, probe the Soviets' willingness to engage in arms control agreements tli11 will increase crisis stability. And I would include both nuclear agreements and convt¹11 tional force agreements. "[1]

Concern for crisis stability was reflected in 1987 by government action as w<11. 'l't•n days before that meeting in Atlanta, Secretary of State George Shultz and Sovie·! Fm eign Minister Eduard Shevardnadze signed an agreement establishing nuclear riHk It• duction centers in Washington and Moscow. The original stimulus for the agc<•l11l•l11 was a 1982 proposal from Senators Sam Nunn (D-Georgia), John Warner (R-Virginiu), and Henry Jackson (D-Washington) for the creation of a joint crisis control center to increase crisis stability. Although the 1987 agreement was a pale version of the origituil proposal, it did represent a bilateral recognition of the issue's importance.

A more substantial development occurred at the December 1987 summit in Wmlh ington when the United States and the Soviet Union signed an agreement to eliminnlv INF. Some in the United States worried that the INF Treaty would spur preSHLlrt'H to reduce reliance on nuclear weapons for NATO defense still further. There is .liltl1• doubt, however, that the treaty contributed to crisis stability, particularly from tIll' perspective of the Soviet Union. The American PERSHING II missiles deployed i11 West Germany had the capability of destroying much of the Soviet command syst1•l11 with little or no tactical warning. Although command centers in the continental Unit1•d States were never threatened by Soviet missiles abolished by the treaty, NATO and other European-based military command centers did face such a threat. Thus, e:nl'11

id(• gaiill'd HOliW ad<ll'd rriHiH iiltlbility from llw INF Hl{l'l'('.'ll\Cllt ▷y 1t•duri111(lite rem that itH ndvt•rHnry might bt t<!mpted lo launch a preemptive slrikc for which tlwrc might lw no waining.

Tlw United States also continued in 1987 with a major unilateral effort to improve ro111111mnd, control, communications, and intelligence (01) systems. In the early and 1nid-W801-1 there was a growing recognition of the centrality of systems for the com-111ind 1111dcontrol of military forces and their alarming vulnerability to disruption by a ▪111al nudcnr attack or even sabotage or jamming in a major crisis. It is generally ac-t'tlplcd by mithorities on the subject that stability would be improved if both the United Slates and Soviet Union were confident that their command systems, as well as their ▪trulcgic forces, could ride out an attack.[2]

Responding to such concerns, the defense budgets for FY 1985-1989 included a 111ajor commitment to upgrade the American C^3I system. At the strategic level, these improvements should provide a more secure and reliable system able to give tactical wnrning of an impending attack and permit a communication and data network for the national command authority (president and secretary of defense), their alternates, the nrnjor nuclear commanders, and the strategic forces that they direct.

In a future crisis, the United States and Soviet Union may well face an increased risk of war unless strong steps are taken to reverse the trends in evidence in the late 1980s.

These three acuons-the agreement on risk reduction centers, the signing of the INI 'treaty, and the major U.S. investment in improving its C^3I can be viewed as indicators of a growing concern with crisis stability. Directly or indirectly, they address the clangers inherent in major crises involving the United States and the Soviet Union. Whal explains this accelerating interest in the problem of crisis stability?

In part the answer may be recognition that war between the superpowers appearH far more likely to result from a crisis in which basic interests of both countries an• !ndangered than from a sudden surprise attack. A widely recognized characteristic of mnny politico-military crises is the difficulty policymakers experience in maintaining con-trol over the sequence of events. Leaders on all sides of past crises have consistently 1'•ported the experience of "things getting out of hand" and a "sense of losing control." Another even more sobering reason for concern may lie in the fact that crisis stability h.,s nctually declined in recent years. In a future crisis, the United States and Sovil'I Union may well face an increased risk of war unless strong steps are taken to reven,1• the trends in evidence in the late 1980s.

T'hc Concept and Its Implications

Fl cq1wntly crisis stability is regarded as a special case of deterrence stability. As a11 1xt<•11sio11 of deterrence, the concept can be seen as the continued belief of both sid!'H Ihat (•vcn Linder lhe adverse circumstances of a crisis, each side's nuclear strategir

forccH would Hllll h• t ilp,1bl1 1 ol i1111it1111g1111:u-n•p1i1hll• ch11naw• m1 the• olhc•1. C11i•1 'llil-bility would lw li1 lh(!1 1,1t1•11l,(tlw1wd hy 1-01111idp11n• Ui;,t a H11hHln111i11l pw 11011 ol' t,11 li side's stralc$,,rjc nud1-ji1t forces would HUI vive to inflict 1-d:1li;1tio11 1!v1•11 1111<11 c11t 11111 stances most favorable to the initial atL;u;ker. As llHcful aH Sll('h short h:uul œ111·1·pl111111 zations may be, it is important lo conceive of crisis stability in ;i mon• g<11('11k 111,111111·1 Some of the more simplified definitions of crisis sU1bility overlook dc11w11ts that 1,111 affect the final assessment of relative stability or instability, espccir11lly if preH<•11t ,m1-ditions change. What may be adequate for crisis stability today may nol be H11ff1-11•111 tomorrow.

Crisis stability can be defined more generally as mutual confidence thr1t hoth HH1•◄ continue to experience very strong disincentives for initiating a major military H1t11·1t 111 a Slldden situation of limited duration involving grave threats to their respcctivt• pd111,11·y interests. These threats frequently entail provocations of war or escalation of 1◄xlH11111 hostilities. In the face of considerable immediate provocation, both sides arc restrai1111d

Several features of this definition warrant further elaboration. Disincenlivt'H 1nm, attack can be created in a variety of ways, including denial as well as reprisal. l>cf<'llHlv1• systems that the potential aggressor perceives as preventing it from successfully de-slroying or capturing its objective would be as appropriate as deterrence. Both i;idc●◄ must recognize that they face disincentives against launching an attack. For st;ibility kl be sustained in a hostile interaction, the factors preserving the degree of equili1J1 hun must be mutual. If one is constrained while the other is not, then the stability hel wl•1'11 them collapses. The disincentives must be mutual and equivalent, but they do 1101 ludvl 1 Lo be identical. In the early period after World War II, when the United States i111t1ially had a monopoly and then a clear superiority in deliverable nuclear forces, it wnH thi' l ed Army rather than Soviet atomic weapons that constrained the United Stt1tt'Hi11 tlic 1 rc'"urrent crises of the cold war.

The reference to confidence introduces the psychological dimension of criHiH 1t11-l>ility. In a crisis, stability continues or erodes in the perceptions and calculatiotlH ol policymakers. The continued mutual constraint from attack rests on a psycholo w.tl Hlate in which policymakers on both sides engage in mental estimates of costH r111d benefits (or fears and hopes) associated with various actions. Presumably policy111alwn1' psychological states are grounded in assessments of objective military and polilicnl rnu-ditions. Psychological confidence in the constraints can be a matter of degree, :1H n111 the objective conditions that are the objects of perception and calculation. It is pot-1t•11hb to have the total collapse of restraints in a crisis (resulting in war)-and that iH th1● ultimate concern-but there also can be gradual erosion of the elements contrihut111g to stability.[3]

Is crisis stability a contradiction in terms? If crises are defined as periods of i11-rreased belief in the likelihood of war, then a reduction in stability-viewed in le• 11111il confidence in continuing disincentives against attack-is almost inevitable. Certi1i11ly drnnges in the policymakers' estimate qf the likelihood of war become pivotal in dd1•1-1nining the status of stability. It does not follow, however, that because a crisiH t'llIII \'Huse leaders to reach such a grim judgment, that all major crises must crelltc llu• l'ondition.

An inherent feature of any crisis is provocation-a threat. Central to the stHtuH of ▪1:-ibility is whether policymakers recognize the continued availability of measures Ihul rnn avert war or major escalation. If they recognize the possibility of such actions, th●11 ii crisis need not automatically reduce stability. For example, the operators of a d1111 rnuld see themselves in a crisis after several days of torr ntial rain. If they did nothio,

llw inl<•grily of tlw da111 could be lhrc:ilcncd by the riHing volt1nw of water trapped lwhind it. Slnbilily, in our sense of the word, would be adversely Hffeclcd. On the other lmnd, if the operators rcco!{nized actions Lhcy could take Lo reduce Lhe threat (divert some w,1ter lo other channels or open floodgates, for example), then the crisis need not cause a reduction in stability.

If international crises do not automatically produce a decline in the disincentive against attack (reduce stability), what kinds of things can happen in a major crisis-indeed are more likely•l•to happen than under normal peacetime conditions-to erode stability? Crises can produce three conditions that adversely affect the confidence that policymakers have in the strength of disincentives.

The first condition is discovery of capability deficiencies. In a crisis, top policymakers may suddenly discover or acquire a fuller appreciation of weaknesses in their own force structures, strategic plans, or methods of operation. The weaknesses may be temporary and a result of key units out of service for maintenance or assi$_{g n}$ed to other duties at the critical moment. They may also result from the discovery of fundamental deficiencies in force structure, mobilization plans, or strategy when applied to the immediate situation. Subordinates may previously have understood these problems but may not yet have convinced top civilian or military leaders of their si$_{g n}$ificance, or funds for the necessary corrections may not yet have been appropriated. Alternatively, weaknesses may result from revised intelligence of an adversary's capabilities or deployment. Not until the opponent makes a move during the crisis are the previous errors in intelligence discovered. A crisis concentrates attention. The resulting discoveries may not always be pleasant.

Provocative preparations constitute the second condition. In response to a serious threat of a military nature to basic interests, a natural step is to accelerate necessary defensive measures. Actions desi$_{g n}$ed to increase readiness by the generating forces, increasing their alert status, and accelerating intelligence collection may all be motivated by prudent defense requirements. The difficulty arises when these measures are interpreted by the adversary as indicators of a commitment to aggressive action. Forward deployment of troops, launching bombers to fail-safe points, and greater security of communications may be regarded as prudent defensive preparations by the initiator. The same actions may be viewed as provocative preparations for attack by an opponent who responds with accelerated countermeasures. An action-reaction cycle of escalating stages of military alert, in which each side is responding to the other's last steps, is a fearsome prospect in a crisis, as demonstrated by the events in Europe in late July and early August 1914.

The last condition is defective policy-making. Crises create stress on the individual policymakers. This does not automatically mean that the quality of decision making must erode, however. In fact, crises may generate circumstances that can actually improve the decision process. The most-qualified individuals will frequently be detailed to the problem from other assignments and will give it undivided attention. With the authority of the highest governmdnt officials engaged, common bureaucratic obstructions can be overcome, and special resources can be mobilized. Nevertheless, as a crisis continues, fatigue and other factors can be expected to have an effect. Furthermore, under severe stress, individuals can behave in ways that are clearly dysfunctional to their objective. The threat of an impending nuclear attack will undoubtedly generate severe demands on all who must cope with the problem. In addition, the high degree of uncertainty and the possibility of extremely short time for information collection and verification can

con1pm111d pHyl'holouil 11111111phy!liolot1il'nl 11trcHH. Fi1111lly, in a rdHiH, ;ill 111kNd1111y m11 be expected lo 111 Ho 11'1lo 1, 1·11l• dt•<•tption and misinfm·urnlio11. Fol' nil lh(•Ht n•)l Oll'i, Lhe quality of dt¹d H0 11 11111k111g'ould <•rode in a crisis.

These factors CHll dm11gc the Lhinking o(policymakers. In particulnr, st•nior offid,11· may be drawn Lo two reassessments of special concern: (1) our rctalialo1'y fon•t• 1 extremely vulnerable and may not perform as desired; (2) major war now 1w1•111Hvit· tually inevitable.

The discovery in a crisis of severe force structure or plan deficiencies c,m ;1<lvl•1·l'ly affect one's confidence in the second-strike retaliatory capabilities that are the bard1tt111• of a strategic deterrence strategy. A critical situation arises if policymakers co,u:hult• that large numbers of second-strike weapons or the command and conlrol syHlt¹111 fm their direction seem unlikely to survive in their present condition if the enemy Hnk1·• first. The assessment in a crisis of weaknesses in the retaliatory capability could h1• abetted by the defective decision-making processes, regardless of whether tlwy 111• induced by stress or deception.

The judgment that one's adversary in the crisis is engaging in provocative niililrn'y actions in the generation of forces can contribute directly to the conclusion Lhal st rat1•git war now seems inevitable. Policymakers may continue to reco$_{g n}$ize that no 11am11,1I objectives are worth the costs of major war but conclude that the adversary fol· Ho1111• reason has taken steps that make it exceedingly difficult to avoid. (It is possihl1•₁ ol course, that the adversary believes it is only taking prudent defensive measures.) ()lil'' again, should the quality of decision making be impaired by the crisis and en(o111·110, for example, a belief that the worst possible case is also the most probable ck•vt•lop ment, then that thinking also contributes to an increased likelihood that war will Hl•1111 inevitable.

This vicious cycle can produce one more step in the process toward the dcslrUl'liWI of stability in a crisis. Under the described circumstances, policymakers may co11d11t11¹ that there is a decisive advantage in attacking first with strategic weapons. Wm¯ 111♦1y suddenly appear far more likely-indeed imminent-because of the seemingly p1·ovm· ative actions of the adversary (perhaps abetted by distortions in one's own dmH1011 process). Temporary or more basic conditions may cause policymakers to realiit• 111111 they may not be able to execute an effective retaliatory strike should the enemy sttlltt· first. Under these harsh realities, the advantages of initiating a first strike mny h1¹ undeniable. Should war seem inevitable, the question arises whether the damagt•H 1x· perienced by one's own country and one's allies have some possibility of being sul>sln11 tially reduced by a first strike. Even if one's own initial conclusion is that the chmll't•Ⅱ are extremely marginal of avoiding a devastating retaliatory blow by initialing a lii¯HI strike, the realization that opposing policymakers reviewing the same situation 111iy conclude differently can force one to reassess further the merits of a first strike. In th•• extreme uncertainty and heightened tension of a crisis, evidence to confirm such HUⁱ picions may not be hard to find. In the infinite regression that can capture reasoning in such circumstances, policymakers may conclude that their counterparts have dccidt•d that they are likely to be victims of a major strategic attack even though no such plan is actually intended. The "I think that he thinks that I think" type of reasoning mny 1)(¹ impossible to substantiate but difficult to avoid. Thus it may become increasingly difficult to resist arguments for attacking first if war seems inevitable or if it appears 011e't opponents have reached that conclusion.

I have described a state of mind that destroys policymakers' confidence in tlw

continuation of strong disincentives against the initiation of a major strategic attack. Figure 11-1 summarizes the sequence described. Existence of any of the conditions appearing toward the bottom of the figure-loss of confidence in one's own retaliatory force, conclusion that war now seems inevitable, and serious consideration of initiating a first strike-is powerfully corrosive to stability.
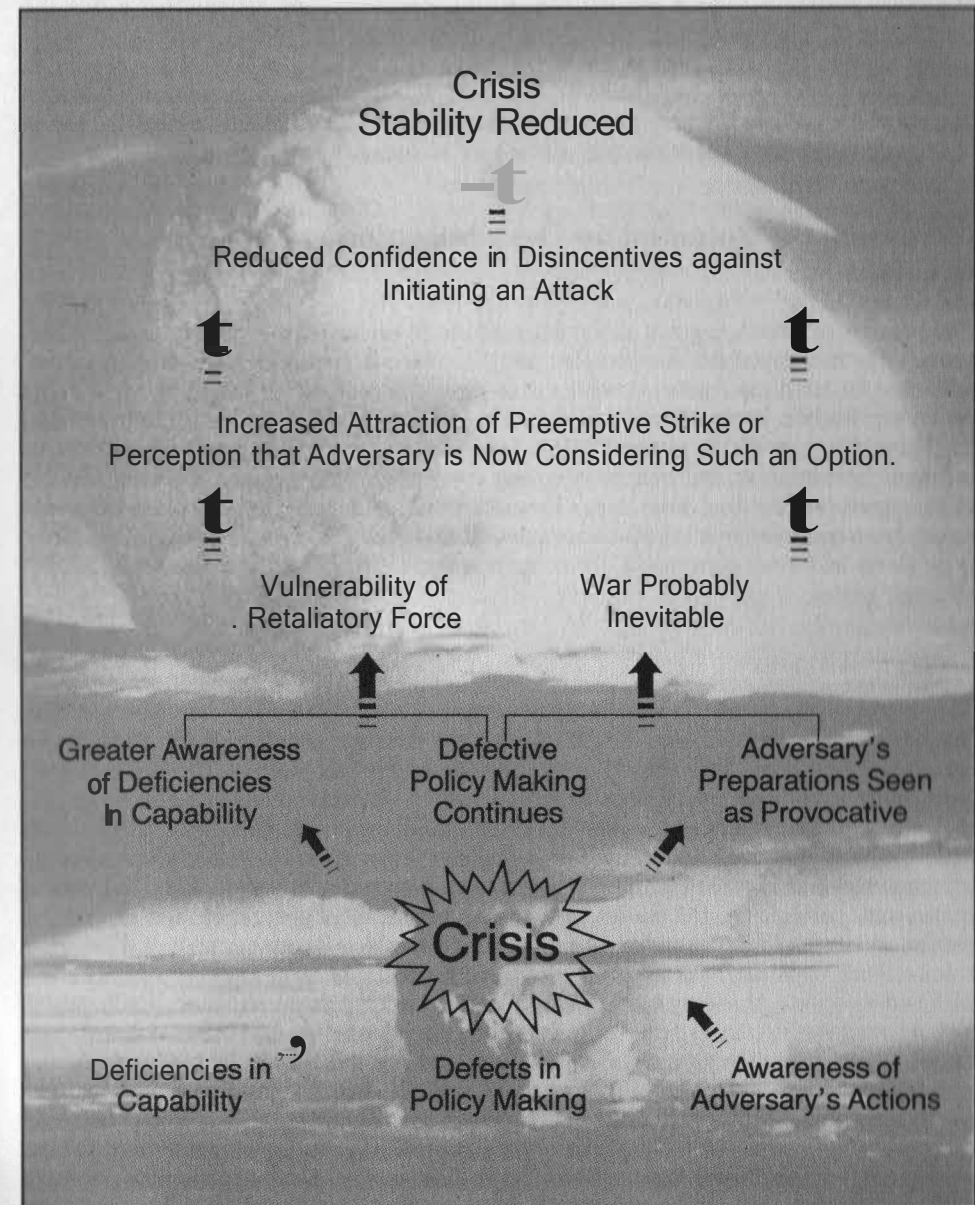
> *Thus it may become increasingly difficult to resist arguments for attacking first if war seems inevitable or if it appears one's opponents have reached that conclusion.*

It is important to recall that these developments can result from a crisis even if a condition of stability prevailed before the crisis. Thus, in the present relationship between the Soviet Union and the United States, both sides depend to a considerable degree on strategic deterrence to avoid major war with one another. The nuclear deterrent force providing each side with an apparent abiity to inflict substantial retaliatory damage even if it is a victim of a disadvantageous nuclear first strike offers stability-the assurance of major disincentives against initiating a major attack. This peacetime stable relation might not last through a crisis.

One of the characteristics of the cold war has been the recurrence of politico-military crises. To recall the history of this superpower antagonism is to take note of the Quemoy-Matsu confrontations, the repeated episodes over Berlin, the outbreak of the Korean War, the rupture over Suez, the collapsed summit after the shooting down of the American U-2, the Cuban missile crisis, and the Arab-Israeli wars (particularly the Soviet-American confrontation during the 1973 war). An examination of Soviet-American relations in the late 1970s and 1980s suggests the continuation of provocations by both sides: the Soviet invasion of Afghanistan, the shooting down of the South Korean airliner, the American proposal to redefine the terms of the ABM Treaty, the American Marine force in Lebanon, and the commitment to supply arms to opposing sides in Angola, Nicaragua, and elsewhere. Despite these continuing disputes, a strong argument can be made that in this time period, the superpowers did not engage in the kind of challenge and escalatory response with the threat or actual use of military forces that characterized many of the earlier crises.[4] Have the United States and the Soviet Union learned to avoid crises or become risk averse in their relationships? Is there a recognition of the dangers of major crises to strategic stability and a tacit agreement to avoid them? Such a conclusion seems premature.

One does not find in the public utterances of the various leaders in the two super-powers references to the extensive danger and mutual harm of crises in a fashion comparable to the rhetoric about the disaster of nuclear war. Nor are the two (crisis and nuclear war) yet viewed as closely linked. Given that both sides have initiated provocations in the past, it would appear that if restraint has been exercised, it occurred primarily because the provoked party chose not to escalate. That cautionary approach cannot always be assumed when vital interests are engaged. It may be appropriate to

P\/„lun- 11-1. Conditions triggered by a crisis r⫶•dudu_g shlbility. The sequence is not automatic, but is more llkt•ly ln a crisis and cnn be ⫶xacerbated by arrangemenIs existing prior to the crisis.

Crisis
Stability Reduced

Reduced Confidence in Disincentives against Initiating an Attack

Increased Attraction of Preemptive Strike or Perception that Adversary is Now Considering Such an Option.

Vulnerability of Retaliatory Force

War Probably Inevitable

Greater Awareness of Deficiencies In Capability

Defective Policy Making Continues

Adversary's Preparations Seen as Provocative

Crisis

Deficiencies in Capability

Defects in Policy Making

Awareness of Adversary's Actions

speculate that the recent absence of major eHcalatory crises between the superpowers is more than luck, but it would be foolhardy to conclude that such episodes are now safely consigned to the past and no longer need attention as future possibilities.

Crises can reduce an established peacetime strategic stability-not because of semantics (that is, crises are destabilizing by definition) but as the result of the likelihood of a crisis setting in motion perceptions, reconsiderations, and actions that erode the confidence of policymakers in the existence of strong shared disincentives against initiating a major strategic attack. Because this is so, it should follow that the United States, the Soviet Union, and their allies have a powerful interest in minimizing features that could exacerbate the disruptive properties of a crisis. The reality during the period of relative lull in crises over the past decade or so appears strikingly different.

Increasing the Potential for Destabilization in Crises

The process of developing and sustaining a strategic military force and the doctrine and policies for its application are complex and dynamic. It seems unlikely that those responsible for such capabilities on either side have consciously set out to increase crisis instability. Rather, in the effort to pursue other major force objectives, there have been inadvertent negative effects on stability. Some developments in recent years have increased crisis stability, but weighing against those are other changes that run strongly in the opposite direction. Four areas in which serious contributions to crisis destabilization have occurred are (1) characteristics of some new strategic weapons, (2) strategic alerts and force generation, (3) command and control of nuclear weapons, and (4) strategic plans.

Strategic Weapons

The essence of a strategic nuclear deterrent is a survivable second-strike capability that has the ability to inflict severe damage without presenting undue provocation. Some recent weapons developments reduce stability by failing to conform to this requirement. Both sides have been engaged in substantial strategic force modernization programs that include large ICBMs, such as the Soviet SS-24 and the U.S. MX, armed with MIRVs. As is now well understood, a large number of accurate warheads in a single launch vehicle means that multiple targets can be covered with one rocket. The United States and, particularly, the Soviet Union have a substantial portion of their respective retaliatory strategic forces in fixed land-based silos, which comprise most of their rapid counterforce capability. As a result of the deployment of large numbers of accurate MIRVed weapons, these systems have gradually become more exposed. Each side is making some effort to reduce its degree of dependence on fixed-site systems, the Soviet Union by deploying a mobile ICBM (SS-25) and the United States by deploying an SLBM with hard-target kill capability (TRIDENT II D-5). In a future crisis, however, the presence of accurate MIRVed systems will produce greater pressure on policymakers to engage in a preemptive strike or at a minimum to put strategic forces on high alert status to avoid their own vulnerability to first strike.[5] Despite this problem, both sides continue to invest in strategic systems with this hard-target, multiple-target kill

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AntisHtdlite (ASA'T) wt•apons might 1ld qualify tt(·hl·lk;11ly iH H111tl•gir 111111l'l, 11111 tlwir development h;is considerable implications for slnilt•gk dct1·11n·l11·l·. Snll•llilt•n have become another part of both sides' deterrent for('e for wrning, rorl·1ll1,ll·d, 1111ld ronlrol, as well as other military purposes. The sudden loss of such satdlilt• n1p.ll,1lil y would render the victim momentarily blind and deaf. The destruction of sat1.'llitl•s wmrld lw immensely provocative (although perhaps somewhat less provo<:alive Ihll1 1 rrn·1lpa·rnble acts on the earth's surface). Elimination of those systems might rll1Hml11ll>lv 11l• assumed to affect adversely the quality of decision making among the victim's cnl1l1l,l11lll i11 ways that would not automatically benefit the satellite aggressor. Bolh Ilw Sovl1•l Union and the United States have, nonetheless, elected to develop ASAT wl,l:ipo·lh.

i\SA.T capability on both sides appears limited in the late 1980s. Even if imprnwd, Ihe first generation of missiles designed for this mission would threaten only low·Ill·Ih·1 satellites or those in highly elliptical orbits. Although most U.S. strategic s:ill'llill'S 11l• stationed in very high orbit, both countries maintain numerous low-orbit milil·11·y 'lill· dlitcs of great importance for intelligence purposes, and these could become vllhwl·ilhh• in the reasonably near future if present trends continue.[6] Soviet or Amcrit·:·1ll HI),111' 111lines capable of following a course-altering target and exotic technoloi:(il'S, surh 1l· Ihose being developed as potential components of a future ballistic missile dcfl•l·1;·l·, pw.I' more serious problems for the future. The importance of satellites for a wm·it·l y nl operations, including battle management and potentially for antisubmari,w w:11l,111•, 1l·akes increased dependency upon them seem certain, and with this growing l1lp11l·lanee the attraction of an ASAT capability may be irresistible as well. These pr<·Hl·ltl·n will pose serious problems for crisis stability.

Beyond this, the U.S. SDI and its Soviet counterpart need to be examined lw· til·ll· potential effects on crisis stability. In need of particular attention are the implirnl·1lll1 (or strategic decision making of any system designed to attack ballistic missik•H ill llwir boost phase, the period of three to five minutes from the ignition of the main trn·11l•l 1•11gines just before liftoff until the final-stage rocket engines shut off. To destroy l1lgl• numbers of missiles in the boost phase, the defensive systems must identify rorll1·1l launches, track their flight paths, launch interceptor beams or projectiles, asst-HH whot t:irgets remain, and prepare for another iteration of attack, as well as relay tlw d:iln·111 other stages of the defense systems-all in under five minutes.

Clearly only the most superficial human decision participation, if any al all, could l)l1 pL•nnitted in this highly compressed time. The large number of systems lhHI·11111Hth·l1 i11Legrated with extremely high accuracy and reliability raises the specter of syl·ll·1ll1 (•rrors. The consequence of such events would depend critically on when they on·l1·11l·d (for example, in a crisis or not) and what other strategic systems on each sidt• wt•tt• linked with the activation of one side's space-based BMD capability (such as neighbori111,l npace mines or offensive retaliatory missiles).

Beyond the ASAT implications, the consequences for crisis stability of any ml11·111litment to deploy a space-based ballistic missile defense may depend on the pnl·1klll·11·rnnfiguration of the system deployed and what other features of strategic dcl(•1·nl11·t· rllc linked to such an automated system. With respect to the deployment of wmpnl1 nystems that compress decision time in a manner that erodes crisis stability, Llwn• 1:l11 In' liltle question that NATO's deployment of PERSHING IIs and the Soviet Union's

deployment of SS-20s (slated for elimination under the INF Treaty) had a negative affect. They reduced decision time for European command centers on both sides to almost zero. The Soviet Union's experimentation with close-in stationing of their ballistic missile submarines in the Atlantic poses the same threat to Washington and the East Coast of the United States.[7]

In summary, recent weapon system developments increase the vulnerability of a significant part of the existing retaliatory force, pose a future threat to satellites at the time when both nations are becoming more dependent on them, and reduce the decision time available between the launch and arrival of nuclear weapons. All of these developments illustrate the pressure of new weapons on crisis stability.

Strategic Alerts and Force Mobilizations

At the outbreak of a crisis, an obvious and necessary task is to increase the readiness of appropriate military forces, including strategic forces. Ordering forces to a higher state of readiness can serve multiple useful purposes. It provides a signal of resolve to the adversary; it often provides increased intelligence gathering and processing; it can reduce the vulnerability of one's forces to surprise attack; and it increases a country's capability to initiate prompt military action if needed.

There is also a downside to increased alert levels. Steps taken to increase one's own preparedness can trigger what Ned Lebow calls "miscalculated escalation."[8] An adversary can easily read one's own mobilization as highly threatening and feel compelled to respond with a higher alert level.

The United States has increased the alert levels of its worldwide strategic forces three times; the most recent occasion was during the Arab-Israeli War of 1973.[9] The Soviet Union occasionally has put selected units on higher alert but appears not to have done so simultaneously for all its strategic forces. Despite the fact that there has been no worldwide strategic alert since 1973, this is still an area for concern for at least two reasons. The first results from the changed strategic balance between the United States and the Soviet Union. The second flows from a necessary precaution that both sides may feel compelled to take in future acute crises to ensure that a sudden loss of their highest authorities does not lead to the immobilization of their strategic forces.

Since 1973, the strategic balance between the Soviet Union and the United States has moved to one of essential equivalence or rough parity. Thus, the Soviet Union may no longer be willing to permit the United States to demonstrate unilateral resolve by moving to higher strategic alert levels without responding to deter bluffing and prove its own resolve. Mutual strategic alert escalation in a crisis between the superpowers has not occurred before. Should an increased alert happen in the future, it could trigger the kind of escalatory behavior that sharply weakens confidence in the continued operation of constraints. Moving back down to lower alert levels will be difficult because the side that does so first will be momentarily more vulnerable. Joint action for alert reduction in times of heightened hostility will be difficult to arrange.

In a future acute crisis, the American president (and perhaps his Soviet counterpart) could be expected to delegate down the chain of command the authority to initiate the use of nuclear weapons.[10] This would reverse the peacetime practice in both countries of restricting to the very highest levels the authority to release nuclear weapons. This dispersal of authority in a crisis has become a necessary precaution against a possible enemy attempt to immobilize the strategic system by almost simultaneously

killing the president, wiping out the high command of the Joint Chiefs, and otherwise hollowing out the president's constitutional chain of command. (Particularly the Soviet ICBMs now pose an equivalent threat.) To prevent accidents in inaccuracies of blast-effect weapons and sophisticated intelligence about the likely location of key figures make such acts imaginable.

Because the authority to initiate the use of nuclear weapons would be dispersed as the crisis deepened, more individuals would have to make independent judgments about whether the use of nuclear weapons should be authorized. If there were a massive disruption of communications, the problem would be most acute, particularly for submarines carrying submarines on high alert. (Submarines have no physical constraints on handling nuclear weapons outside the boat's crew themselves.) The perception or belief in a crisis that the other side had widely delegated authority over the use of nuclear weapons could be regarded as extremely threatening.

Command and Control of Nuclear Forces

For decades military authorities have recognized that an effective retaliatory capability requires that the weapons themselves be capable of surviving an initial nuclear attack under worst-case conditions. If retaliatory forces had a high likelihood of being unable to survive such an attack, they not only failed the retaliatory role, but their deployment would also be regarded as provocative by an adversary. Because they could not be used in retaliation, an opponent could be justified in assuming their purpose must be as part of a first-strike attack. Only in the 1980s was there a broad recognition that the same requirements for survival that govern nuclear weapon use must also apply to the command and control networks. With respect to crisis stability, there are two important command and control issues: the vulnerability of the top leadership and the vulnerability of physical systems of communication.

Only in the 1980s was there a broad recognition that the same requirements for survival that govern nuclear weapon use must also apply to the command and control networks.

The problem of the exposure of top national authorities to sudden elimination was introduced in the consideration of new problems in force mobilization. There are difficulties resulted from one attempt to minimize the risk of rendering retaliatory forces ineffectual by dispersing nuclear authority in a crisis. Here we must recognize the other side of the dilemma. Soviet SLBMs off the East Coast of the United States have flight times of under twelve minutes, and comparable American Poseidon and Trident missiles close to the Soviet perimeter pose a similar problem. If the authority to use nuclear weapons remains in the hands of the general secretary or the president and their

line of succession in the event of his incapacitation passes sequentially through a limited number of individuals, then it might be possible to eliminate them all with a small number of rapid and accurate missiles. The retaliatory system would remain intact, but the political authority to use it would be gone or severely disrupted.

Although the relative number of targets might be somewhat larger, the same effect might be achieved by targeting key points in the physical network of command and control of nuclear forces. The general vulnerability of the strategic C^3I results from numerous factors. These range from the softness of many elements in the system (such as satellite receiver stations on earth, radars, telephone exchange centers) to the uncertain extent of disruption of nuclear detonations (that is, the electromagnetic pulse) on the performance of electronic equipment and certain radio frequencies; from the increased operational requirements that result from adopting more complicated strategic plans to increased complexity arising from the tight integration of more elements of the defense system. The last-mentioned vulnerabilities result from new C^3I requirements that have been imposed on the system in recent years. The potential consequences are clear: a relatively small attack aimed at C^3I targets, most of which are at fixed locations, essential for directions of strategic retaliation, could seriously disrupt and limit the effectiveness of a deterrent capability. Realization of such vulnerability clearly undercuts the policymakers' confidence in the ability of their forces to carry out a second strike.

Changing Strategic Plans

Plans for the use of nuclear forces-as revealed by official statements, documents, and analyses by informed observers-also can affect stability in a future crisis. Explorations of existing declared policies and the discussions of possible modifications or alternatives are a more or less continuous feature of the superpower relationship. These policy assessments are frequently responses to changes in the capabilities or vulnerabilities of weapon systems or their related command and control. In recent years, proposed strategic plans for prompt response and preemptive decapitation have had powerful implications for stability.

With the increasing vulnerability of fixed-site, land-based ICBMs, the strategic plans of both sides appear to have moved to include some form of prompt response option for those systems. The basic concept is to launch such weapons before most of them are destroyed by an incoming first strike aimed at them. Specific options can range from launch on warning of an attack-that is, when tactical warning devices pick up the firing of enemy missiles-to launch from under attack, which assumes the retaliatory ICBM force is activated as the first enemy nuclear detonations occur. Whether there can be a real distinction between these two options in practice depends on a number of considerations, including the lapsed time before warnings can be converted to commands and whether high-altitude nuclear detonations can pin down the retaliatory force.

Although such strategic plans address the weakness of the existing ICBMs they generate new difficulties. Clearly they create almost unimaginable stress on the policymakers who must decide whether to accept the warning of an impending strike as valid and authorize a release in substantially less than thirty minutes. The magnitude of the error if the retaliatory force were released but no incoming attack had occurred would be staggering. Such an authorization would almost surely call for a heavy attack because there would be little point in leaving many of those targeted missiles unspent

If low order wanted to avoid flew collision low willingphil-l-. One of the hair tml l-llg features of the plan would be the equationl to do tightly the keel mllk willl uKylll-lll with the attack system. As Paul Bracken has noted, "Tight led multiplied HyHill" 1HI notorious for producing overcompensation effects."[11] Thus, warning of any transformation in any part of the system is more likely to get repeated multiple times distorted in the process. Time-consuming verifications and controls that might otherwise under normal conditions are more likely to be overridden by the requirements. Im the gency during a crisis. When one superpower commits to prompt response, authorities in the opposing country will conclude that their adversaries have built into the cHHI a hair-trigger element.

During the period of Soviet strategic nuclear disadvantage, military writers in the Soviet Union considered the possibility of a preemptive nuclear strike if llwill mllll y need a deteriorating crisis with the United States. Such considerations reportedly hitVl declined in recent years. NATO still adheres to a policy of first use of nuclear weapons in the European theater if a Soviet conventional attack cannot be stopped in ollwl wly. Although the NATO emphasis is on tactical nuclear weapons, the INF agreement may compel the use of some strategic weapons to complement the remaining short-nlllw battlefield nuclear capability if the policy is to be retained.

All forms of preemptive use of nuclear weapons pose staggering problems for HiI stability. One strategic plan of this sort that has received recent attention involveH the preemptive use of nuclear weapons against the enemy's strategic command and control system. How large such an attack might need to be to disrupt seriously n H'l:th:llm v l'Hpability is open to question. According to Bruce Blair, "Half the 400 primary secondary U.S. strategic C3I targets could be struck by Soviet missile submline-l-mi routine patrol."[12]

The temptation to launch such an attack if nuclear war seemed inevitable HIhll ll might significantly reduce the effectiveness of a retaliatory response. To the policymakers, it might appear to offer some remote chance, if totally successful, ll avoiding any retaliation at all. Even more than prompt response, the possibility that ill a crisis an adversary might be seriously inclined to entertain such a prospect could erode a policymaker's confidence that his own forces would be able to respond regardless of the adversary's action. Believing that an opponent might seriously be considering preemption would surely weaken a policymaker's belief that war could be avoided.

The Dilemma of Increasing Crisis Stability

The dangers sketched here have triggered growing attention among security analyHts and some policymakers and generated numerous studies and recommendationH. Some seek to strengthen crisis stability by elimination of the weapons or activities judged to undermine stability. For example, if ASATs are a problem, then a proposed prescription is the prohibition of such systems.

Another approach is to address some of the expected adverse effects rather than the source of the problem. Thus, because SLBMs could threaten the sudden elimination of top political and military leadership without warning, a possible solution would be the creation of agreed upon "keep-out" zones that would require submarines to stay at greater distances from critical targets and thereby increase the flight time of their missiles. A different proposal, also intended to deal with consequences of close-in SLBMs,

would require one top policymaker in the chain of command to be safely away from the capital, and other highly vulnerable places, whenever a crisis erupts. (This could be a political extension of the Looking Glass arrangement that keeps a SAC general officer airborne as a backup military command post.) In general, proposals can be divided between those intended to avoid crisis and those that seek to improve crisis management. (The prohibition of ASATs would presumably be a crisis-avoidance proposal, whereas the protection of a political leader in a crisis would be classified as crisis management.) Proposals for strengthening crisis stability differ as to whether they can be implemented unilaterally or whether they necessitate bilateral or multilateral participation.

Table 11-1 displays illustrative examples of both crisis avoidance and crisis management proposals that are unilateral, bilateral, or multilateral. A number of other recommendations for improving crisis stability have been advanced and new ideas continue to emerge, but the movement from proposals to government action reveals a wide gap.

The steps for improving crisis stability advanced by the U.S. government noted at the outset of this chapter serve as cases in point. Such measures and the pace of action seem exceedingly modest as measured against the variety of recommendations advanced or, more critically, the scale of the problem. The risk reduction centers agreed to by the United States and the Soviet Union bear little resemblance to the more elaborate ideas that emerged from the proposals of Senators Nunn, Warner, and Jackson. In their final form, the centers are little more than communication posts in each nation's capital for the rapid exchange of text and graphic information via satellite. The primary purpose is to transmit information that the superpowers already have agreed to exchange under various confidence-building measures such as the 1971 Accidents Measures Agreement (clarified further in 1985). This agreement requires each side to notify the other in advance about any ballistic missile launch whose expected trajectory goes outside the firing nation's boundaries, as well as requiring reports on various nuclear activities. The risk-reduction agreement leaves open the possibility that other confidence-building initiatives could be reported through the centers, but the Soviets have already demonstrated reluctance to use the centers for such purposes.[13]

The vision of active joint efforts to examine areas of potential future crises, to consider various proposals for tension reduction, and to serve as possible forums for working on the resolution of existing conflicts has been shelved. Although the signed agreement specifies annual meetings of representatives of the two separate national centers, the chances that middle- and senior-level officials on both sides will use the centers as a place promoting substantive dialogue appears remote. There can be little objection to the creation of additional technical channels for government-to-government transmission of information (sort of a nonemergency hot line), but it does not appear to be a vigorous step toward resolving any of the major problems associated with crisis stability.

By contrast, the unilateral efforts of the United States to upgrade its own command and control system address the more significant crisis stability issues of C^3I vulnerability. This multiyear program includes a Ground Wave Emergency Network (GWEN) designed to provide a system for transmitting information and orders about a nuclear attack that is resistant to jamming, sabotage, and electromagnetic pulse from high-altitude nuclear bursts. Another element of the improvement program consists of a component on each MILSTAR communication satellite to permit encrypted, two-way communications in an environment in which some nuclear weapons have been deto-

Table 11-1. Illustrative Proposals for Enhancing Crisis Avoidance and Crisis Management Content

	CRISIS AVOIDANCE	CRISIS MANAGEMENT
UNILATERAL	1. Reduce reliance on strategic weapons with lowest likelihood of first strike survival.	1. Reduce requirement for comprohonsive increases in force preparedness at higher levels of strategic alert (I.e., make possible higher alert for C3I thon for forces; or permit some forces to be withheld from higher alert levels)
	2. Upgrade strategic command and control systems.	2. Send top leader out of capital to secure location at beginning of crisis.
	3. Involve highest level political leaders in exercises about crisis avoidance and management.	3. Signal reassurances during crisis of actions one will not take in immediate future.
BILATERAL	1. Prohibit deployments of strategic weapons with short flight times near borders.	1. Develop consensus on norms or rules of crisis behavior.
	2. Agree on code of conduct for crisis prevention.	2. Activate joint military communication links for exchange of data between top military officers (parallel to "hot line")
	3. Restrict testing of SLBMs in depressed trajectories and anti-satellite weapons.	3. Use joint crisis games or review of historical crises to identify potential kinds of problems for accurate signaling and perception.
MULTILATERAL	1. Create an international agency for monitoring the launch of strategic missiles.	1. Create rapid communication on network that can be configured in a crisis to include various key capitals.
	2. Establish confidence building measures between opposing alliances.	2. Engage major officials of international organizations in crisis games and historical reviews to explore conditions under which 3rd party mediation is useful.
	3. Strengthen procedures for conflict resolution in 3rd World without direct Involvement of superpowers.	

nated. These satellit,H will lw m111pl1•111cl1Wd hy vndouH nwbil; grou11d :;;tnlions whose movement should ni;1kc them le!:ls vulnerabk• to sul·prise aw,ck. These steps to strengthen command and control arc u!:lcful but modest, and their full completion and logical follow-on could face some risk of stretch-out or elimination from defense budget cuts undertaken to avoid automatic deficit reduction measures. Even if fully developed, these improvements must be recognized as giving only limited C3I improvement. An American Academy of Arts and Sciences-Cornell University study observed that GWEN "is not intended to endure in the face of deliberate attack" and "should antisatellite capabilities continue to evolve, MILSTAR could prove to be vulnerable. "[14]

Bruce Blair issues a more general caution about the current commitment to improving the nuclear command and control system and future follow-on efforts: "Consensus on this priority masks a number of decisive issues, however, especially the proper aims of command system development, their technical feasibility, and their affordability. "[15] At a minimum, the improvements intend to increase the survivability of the system in the opening moments of a nuclear attack. At best, they might enable parts of the system to endure a limited attack for a period of hours. But the assumption still appears to be that the adversary makes no deliberate concentrated attack on all parts of the command and control system. Thus, the system may be more secure for a prompt launch policy but still contribute to crisis instability.

The INF agreement contributed in a little-noticed fashion to the improvement of crisis stability. The treaty's abolition of U.S. PERSHING II missiles from the Federal Republic of Germany reduced some of the pressure on Soviet command and control systems west of Moscow within range of such weapons.

Of course, both the British and the French retain national nuclear missile forces that could perform similar strikes-assuming the appropriate accuracies-as do forward-deployed American submarines carrying SLBMs assigned to support NATO. Despite the remaining hazards, one might have expected the crisis-stabilizing contribution of the treaty to have been given more public attention. Perhaps this lack of recognition was because the Soviet Union was the principal beneficiary, but it may also be because problems of crisis stability are still not perceived as a central issue by the media or the highest levels of government. Had the issues mattered more in policy circles, one might have expected the Americans to insist on a quid pro quo with respect to Soviet SLBMs stationed in the Atlantic. Although the INF Treaty is widely viewed as a precursor to a START (Strategic Arms Reduction Talks) agreement, which presumably would cover SLBMs in some respects, the linkage between Soviet SLBMs and PERSHING IIs remains an understated connection.

Conclusions

Crisis stability requires that despite substantial provocation, both sides in a confrontation remain confident that each continues to have very strong disincentives against a major military attack on the other. Under the conditions prevailing between the United States and the Soviet Union, the primary disincentives are the strategic nuclear forces that each could use in retaliation against the other.

The evidence reviewed in this chapter suggests that during the late 1970s and 1980s, the superpowers weakened crisis stability even while they successfully avoided

,1111:tjor diit,I 1-11Hi. hl I 11111lie IIIHIH bel wl•l•11 (lt1• l),1111<1 Stn11,11,111l llw Sovh•I I hl1@, lh!! odds of rl,1-lolvil1g thl• 1,1111lwltutiol1 without wm 11lay lw 1-l01111•wht 11•1111ll1111 l1il•y were in lhe 111lid-H>70s. Sol11l' devdop111cnts huvc i111prowd ri·isi stahilil y; 111•vl•11111• lt•ss, there is enough evide,we indicating cl11('rosion in nisii; stability to gl•11N1ll• 8fl'il11l' rnnccrn. It is difficult to escape the conclusion that despite a burgeoning lilt•rnl 1111• 1111 the problem, additional measures to strengthen crisis stability have nol rigun•d Il•1ll 1,lllv in government policies or actions for either superpower.

The evidence suggests that during the late 1970s and 1980s, the superpowers weakened crisis stability even while they successfully avoided a major direct crisis.

One reason is that such measures often conflict with other requirements for dl•l·1l 11•l1cc or other military missions. Improvements in crisis stability will come al ff mHI lo 111lwr considerations. Several of the activities that threaten crisis stability illu8l r:tt(• i1111 pt ol)lcm. Strategic alerts and the mobilization of forces in a crisis can be pcrcl•ivl•d hy 111adversary not as prudent defensive measures or declarations of commil1111•nt l>111 lIHl! td as preparations for immediate military aggression.At the same time, in vit•w ol Illl' dangers that an acute crisis likely poses to basic interests, increasing one's col11b,lI 11•itdiness may serve to call an adversary's bluff or, should war occur, they may slulpl• 1111•011lcome.

There is the further dilemma of determining what specific actions will be r('!11 tli•d stl·engthening or diminishing crisis stability. During a crisis involving Europl•, fot •(;1111plc, the dispersal of NATO nuclear weapons might trigger a preemptive Sovl1•t tll,wk<, or it might increase deterrence of Soviet attack. Alternatively, as Blair IIOl•H, 'I1tl1tlrt• lo disperse those weapons leaves them vulnerable to future attack and might 111vil 1• Soviet attack. Or it might allay Soviet fears and relax their preemptive triggt•r. It 11'1l111possible to determine in advance which effect would predominate.

i\n effective ASAT capability could threaten to destroy the command and col1l1'ol 111 111l1dl•clr weapons, and that potential poses a problem for stability in a crisis. In a 11111lwl1tional war, however, the information culled by enemy commanders from s:itt•l" lit"" 1111k<their use in guiding enemy weapons to targets could be such an advanla):(u 111111 1livl•loping the capability to deny the enemy that resource may be irresistible. Mor1 1• llvl1; not all satellites contribute to crisis stability. A future satellite system that ul lcov• 11•d SLBM-carrying submarines on submerged patrol could destroy the second-stl il11• ql1111lly of that deterrent system. Paul Stares succinctly poses the dilemma: "Antisntl•l• 1111' wl•11pons may be desirable in wartime but could prove positively unwelcome in a l,\'1 111• 1·iisis. "[17]

t11 often acknowledged solution to the vulnerability of fixed-site, MIRVed ICBMs 1, 111l both sides to shift to single-warhead, mobile ICBMs. Yet mobile ICBMs (0FF• 111111111lthnllenges to verification and therefore raise difficulties about the ability to con-

trol their numbers in uny :11111&agrct'lll(..•llt. Moreowr, the developnwnt of a new syBtcm poses significant financial and olhcr cosls thAt bureaucracies arc likely to resist. Additionally, in the United States, mobile JCBMs could create environmental and other difficulties in domestic politics.

The United States faces a basic question: where in the overall configuration of strategic requirements does the need to strengthen crisis stability fit? Are we prepared to say with former Secretary of Defense McNamara that crisis stability should be a fundamental priority? If so, do we agree with his view that arms control should be the initial way we seek to pursue it? Because crises continue to be the most likely events that could trigger war between the superpowers, continued neglect of the impact on stability of our evolving security system sets the stage for a future tragedy. A way must be found to configure security so that it promotes stability in ordinary times and in crises.

under the dual control of the United Slates and Uic Fcdt'ral I{i'puhlic ol' (;('nnnny, whi('h Wt'f(' to be withdrawn in conjunction wilh the Soviet-American treaty.

16. See Mandelbaum and Talbott, *Reagan and Gorbachev*, pp. 146-150.

Chapter 11
Crisis Stability in Soviet-American Strategic
Relations

1. Transcript of the meeting of the Secretaries of Defense, Southern Center for International Studies, Atlanta, Georgia, September 25, 1987.

2. Desmond Ball et al., *Crisis Stability and Nuclear War* (Ithaca, N.Y.: American Academy of Arts and Sciences and the Cornell University Peace Studies Program, January 1987), p. 2'.l. This report summarizes the findings of a study group whose full book-length report will be edited by Kurt Gottfried and Bruce Blair and published in 1988 by Oxford University Press.

3. For a discussion of the role of policymaker confidence in a crisis, see Thomas Schelling, "Confidence in Crisis," *International Security* 8 (Spring 1984): 55-66.

4. See Lawrence Freedman, chapter 2, for a discussion of the changing nature of Soviet-American crises.

5. There has been some discussion that the window of vulnerability, as the emergence of the threat to silo-based ICBMs is called, has been exaggerated. A coordinated attack on all ICBMs would pose great problems for the aggressor and large uncertainties about success; moreover, other retaliatory systems would presumably remain intact. For example, see the report of the Scowcroft commission (*President's Commission on Strategic Forces* [Washington, D.C.: U.S. Government Printing Office, April 1983]), which also minimized the vulnerability of such systems while recommending a long-term move away from fixed-based MIRVed missiles. Although the "attack out of the blue" threat to ICBMs may well have been exaggerated, thei1 increased exposure contributes an added concern in a crisis, and there can be little doubt thnt the situation has contributed to pressure for a policy of prompt launch.

6. Paul B. Stares, "Nuclear Operations and Antisatellites" in Ashton B. Carter, John 1). Steinbruner, and Charles A. Zraket, eds., *Managing Nuclear Operations* (Washington, D.C.: Brookings Institution, 1987), draws a distinction between the use of ASATs that might sharply escalate a crisis or cause one and ASAT attacks at the beginning of, or during, a nuclear wa1. The former class of events are of concern to the problem of crisis stability, but it is the fear ol the preemptive use of ASATs to initiate war that poses the more severe problem: "either sidt• may believe-especially if prompt high altitude ASAT systems are developed-that the use of ASATs would limit the extent of the retaliation and improve its chances of prevailing in a nudc111 conflict." Stares, "Nuclear Operations and Antisatellites," p. 696.

7. In January and February 1984, after the United States began deployment of the PERSI I-ING II in Germany, the Soviet Union moved the three ballistic missile submarines normally o1 patrol in the Atlantic closer to the American East Coast. Having demonstrated their point, tlw Soviets have not left the boats at that closer range. See "Three Soviet Submarines Said to Patrol Atlantic Box," *New York Times*, October 6, 1986, p. 6.

8. Richard Ned Lebow, *Nuclear Crisis Management* (Ithaca, N.Y.: Cornell University Press, 1987), chap. 4.

9. The first strategic alert occurred after the summit collapsed in Paris in May 1960, and the second was during the Cuban missile crisis of 1962. See Scott D. Sagan, "Nuclear Alerts and Crisis Management," *International Security* 9 (Spring 1985): 99-139.

10. 1111 111111111•1dlHCLHiSion of this issue, sec chapter Ⅳ by Mo• to11 Halpt•tin.

11. Ị,111Ị llrndH•n, *'!he Command and Control of Nuclct1r WNt/)on.* (New Hawn: Yult· IJ1li-versily Press, 198:J), p. 55.

12. Bruce G. Blair, *Strategic Command and Control* (Washington, O.C.: Brooking!! l11sli-tution: 1985), p. 189. Ashton Carter, however, suggests that depending on how l11orou1<li 1111 attacker wanted to be and how high a degree of confidence in target destruction it required, 1lw number of warheads required could be significantly larger. A critical choice point is whctht '1 llw attempt is to eliminate the key physical communication nodes of the command and control syHl ('Ill, as well as the authoritative human decision makers.

13. The Soviet Union notified the United States shortly after agreement was rcarlwd on the text of the risk-reduction arrangement that it preferred to use normal diplomatic channdH fw the exchange of information on military exercises, troop concentration, and so on Lhal haH ht'('II agreed to as part of the 1986 Stockholm Conference on Confidence and Security Building Ml•11 sures and Disarmament in Europe. See John Borawski, "U.S.-Soviet Move toward Risk Rt•<hll' tion," *Bulletin of the Atomic Scientists* 43 Ouly–August 1987): 16. Some of the original id1•11H fcɪ1 the Nunn-Warner proposal appear in Barry M. Blechman, ed., *Preventing Nuclear War* (Uloo111-ington: Indiana University Press, 1985); John W. Lewis and Coit D. Blacker, eds., N1•xl 811/1. 111 *the Creation of Accidental Nuclear War Prevention Center* (Stanford: Center for hlt•11111111011ɪl Security and Arms Control, Stanford University, October 1983); William L. Ury, lli-vm11/ ⅠⅠⅠⅠ *Hotline* (Boston: Houghton Mifflin, 1985); and Dale M. Landis et al., "Improving the Ml•111r1 lm Intergovernmental Communications in Crisis," R-3157-FF (Santa Monica, Calif.: R∧NI) l'o1 po ration, 1984).

14. Ball et al., *Crisis Stability and Nuclear War*, pp. 21-22.

15. Blair, *Strategic Command and Control*, p. 241.

16. Bruce G. Blair, "Alerting in Crisis and Conventional War," in Carter, Steinbn11w1, 1111d Zraket, eds., *Managing Nuclear Operations*, p. 114.

17. Stares, "Nuclear Operations and Antisatellites," p. 703.

Chapter 12
International Security Studies

1. I am indebted to the participants of the February 1987 Conference on 'The Pasl und the Future of International Security Studies" held at Harvard Center for Science and International Affairs (CSIA) to help prepare my report for the mid-decade review of the trustees of lhc l•'ord Foundation; and to Sean Lynn-Jones who acted as rapporteur of that meeting and coaulho,'t'd with me "International Security Studies: Report on a Meeting," *International Security* (Spring 1988).

2. Stanley Hoffmann, "An American Social Science: International Relations," in his)m111s *and Minerva: Essays in the Theory and Practice of International Politics* (Boulder, Colo.: Wcsl-view Press, 1987), chap. 1.

3. See Robert A. McCaughey, *International Studies and Academic Enterprise* (New York: Columbia University Press, 1984).

4. Herman Kahn and B. Bruce-Briggs, *Things to Come* (New York: Macmillan, 1972).

5. J. M. Keynes, *The General Theory of Unemployment, Interest and Money* (New Yori<: Harcourt Brace and World, 1965).

6. See Nye, and Lynn-Jones, "International Security Studies."

7. See the essays in *World Politics* 38 (October 1985).