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De-Alerting: Diagnoses, Prescriptions, and Side-Effects*

By *The Honorable Walter B. Slocombe*

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By

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The US and Russia have dealt over now nearly two decades since the end of the Cold War with the questions that their continuing possession of the world's largest nuclear arsenals necessarily entail. Neither has reached an entirely satisfactory conclusion as to the role of those forces, and though their size has been drastically reduced, neither shows any real inclination to cease to maintain a strong nuclear force, at least so long as any other nation has such weapons.

Accordingly, for all the discussion of "global zero" whereby nuclear weapons would be completely eliminated, there is considerable focus on how to manage the arsenals that will continue to exist for many years, and it is in this context that the issue of "de-alerting" arises. The UN General Assembly, in January of this year, approved Resolution 63/41 calling for "further practical steps to be taken to decrease the operational readiness of nuclear weapons systems, with a view to assuring that all nuclear weapons are removed from high alert status."

The "de-alerting" concept can reasonably be defined in general terms as taking measures that significantly extend the delay between a decision to use nuclear weapons and the time they could actually be employed. Various measures have been proposed to this end, including:

- Separate warheads from launchers
- Cover silos with dirt
- Remove targeting information from the operational forces
- Keep SSBNs out of range
- Cooperate on warning exchanges
- Change maintenance procedures so that time-consuming rehabilitation would be required before weapons can be used

The theme of this presentation is that there are steps that can be taken to reduce risks of unintended, unauthorized, accidental, or ill-considered use – which are the sort of dangers to which the General Assembly resolution points as the risks of high readiness status.¹ But some of the measures most often proposed in the name of "de-alerting" are inadvisable from precisely the point of view of reducing these risks. In particular, while they may be designed to address aspects of the problem of managing nuclear arsenals in times of calm they would have the effect of making the situation more dangerous in its other – and at least arguably more important --- respects, notably in undermining the chances for restraint in times of crisis. In particular, there is a distinction in this regard between those measures that

¹ The preamble to the resolution asserts that "the maintenance of nuclear weapons systems at a high level of readiness increases the risk of use of such weapons, including the unintentional or accidental use, which would have catastrophic consequences."

strengthen the controls over nuclear weapons and reduce the need or pressures for very rapid use and those that disable the systems operationally, that is that make prompt use physically impossible.

Moreover, the usual catalogue – which, like the UNGA resolution focuses on reducing “operational readiness” rather than other aspects of the effort -- omits some measures that would serve the objective of making ill-considered use of nuclear weapons less likely that would be at least equally effective, and have less potential that operational disablement to create problems in other contexts. These include:

- Improving arrangements for ensuring that the operators of nuclear forces must receive both proper authorization for action and unlocking codes not directly available to them in order to arm and to launch the nuclear weapons
- Increasing the survivability of nuclear forces and particularly the command, control, and communications links with them.
- Cooperative measures – initially between the US and Russia, but gradually bringing in third nuclear states -- to exchange information about events that have the potential to be read – perhaps mistakenly – as initiation of deliberate nuclear attacks
- System modifications to increase the ability of nations to deal with accidental, unauthorized, or mistaken launches – including command destruct mechanisms and limited ballistic missile defenses.
- Refashioning doctrine and planning to eliminate conceptual reliance on any form of nuclear use except in response to a nuclear attack.

De-alerting measures of any description must be evaluated across the full spectrum of types of problems nuclear weapons present and the purposes they serve. Much of the de-alerting discussion is – like too much discussion of nuclear issues generally – apolitical, acontextual, and astrategic in character. Countries did not build and do not retain nuclear weapons by accident, or whim – but with some sense that they serve national interests in broader political-strategic context.²

My premise is that as long as nation-states are unable to agree on measures that will verifiably eliminate all nuclear weapons in the world, those countries that have them will regard them as serving useful security purposes – and at a minimum will regard them as a means of deterring the use of nuclear weapons against themselves or their allies. And it seems to me a necessary corollary of that premise that countries with nuclear weapons will regard it as essential to that deterrent purpose that they have the ability actually to use nuclear weapons in extremis.³

² It cannot be entirely coincidental that the only countries with operational nuclear systems to vote for the UNGA resolution were India and Pakistan. France, the United Kingdom, and the United States voted against. China, Israel, and Russia abstained.

³ It appears that some advocates of de-alerting dispute the basic premise that nuclear weapons continue to have *any* legitimate function, even deterrence of nuclear attack – either because there is no realistic prospect of such attack or because the consequences of any use of nuclear weapons, even in retaliation, would be so terrible as to simply be ruled out absolutely – and that it follows that any use would be mistaken, so that safety should take an all-but-absolute priority over deterrence. That is a serious and understandable position – but it is inconsistent with the practical reality that the issue that de-alerting must address is not making

The issue of nuclear force management is ultimately one of reconciling what one expert has called the “always/never” dilemma – nations with nuclear weapons want to assure that these weapons will always be used when use is essential in the national interest but will never be used in any other circumstances. Inevitably, there is a tension between these two desiderata. The case for de-alerting is essentially that nations with nuclear weapons – and in particular the US and Russia – should substantially shift the balance they have struck in the direction of “never.”

However, even if one accepts that proposition at a high level of generality, it is essential to be clear about what problem is supposed to be addressed in order to evaluate proposals. Several sorts of failures could in principle lead to nuclear weapons being used in situations where use was either unintended or mistaken, from the perspective of the nation whose weapons were used:

- Technical failure: Pure accident – something going terribly wrong at technical/operational level that results in the unauthorized launch and detonation of nuclear weapons
- Custody failure: Take over and use of weapons by an individual madman, a renegade military faction, a terrorist group, or a hostile country
- Information failure: Mistaken belief that an attack is underway leading to an authorized but mistaken decision to launch a responsive attack
- Launch under attack failure – an attack ordered and carried out very rapidly and without adequate consideration in the belief – possibly true, but possibly false – that an attack by the other side is either underway (LUA) or imminent (LOW).
- Crisis failure: Conscious, informed, authorized but profoundly mistaken decision to use nuclear weapons resulting from an escalating cycle of action and reaction in a crisis.

Technical Failure

Let’s start with Technical Failure – the focus of a great deal of the advocacy, or at least of stress on past incidents of failures of safety and control mechanisms.⁴ Much of the “de-alerting” literature points to a succession of failures to follow proper

nuclear weapons essentially unusable, but recognizing that they will continue in the superpowers’ arsenals for many years and minimizing the risks of unintended or mistaken use while retaining their deterrent potential. It is also worth making the point that taking steps that, as a practical matter, make the actual use of nuclear weapons virtually impossible while ostensibly retaining a policy of deterrence would even be inconsistent with the argument – which was, for example, arguably advanced by the American Roman Catholic hierarchy in the nuclear debates of the 80’s – that while actual *use* of nuclear weapons would be morally (and otherwise) unacceptable and indeed irrational, it is nonetheless legitimate to *threaten* such use as a means of deterrence. Leaving aside the extraordinary difficulties of successfully carrying off a bluff that you have in principle determined not to carry out, any such doctrine depends for its efficacy on maintaining an apparent capability for actual use.

⁴ It is, I think, fair to say that the most serious advocates of de-alerting believe the issue is less pure technical accident (or mistakes by low level operators) than the dangers inherent in a policy – or even a capability – for a very compressed decision on use of nuclear weapons, in particular, a policy of reliance and maintenance of the capability for, launch under attack. However, much of the rhetoric associated with the public case for de-alerting concerns the possibility of technical or operational failures.

procedures and draw from that history the inference that a relatively simple procedural failure could produce a nuclear detonation. The argument is essentially that nuclear weapons systems are sufficiently susceptible of pure accident (including human error or failure at operational/field level) that it is essential to take measures that have the effect of making it necessary to undertake a prolonged reconfiguration of the elements of the nuclear weapons force for a launch or detonation to be physically possible. Specific measures said to serve this objective include separating the weapons from their launchers, burying silo doors, removal of fuzing or launching mechanisms, deliberate avoidance of maintenance measures need to permit rapid firing, and the like. .

My view is that this line of action is unnecessary in its own terms and highly problematic from the point of view of other aspects of the problem and that there is a far better option that is largely already in place, at least in the US force – the requirement of external information – a code not held by the operators -- to arm the weapons.

Advocates of other, more “physical,” measures often describe the current arrangement as nuclear weapons being on a “hair trigger.” That is – at least with respect to US weapons – a highly misleading characterization. The “hair trigger” figure of speech confuses “alert” status – readiness to act quickly on orders -- with susceptibility to inadvertent action. The “hair trigger” image implies that a minor mistake – akin to jostling a gun – will fire the weapon. The US StratCom commander had a more accurate metaphor when he recently said that US nuclear weapons are less a pistol with a hair trigger than like a pistol in a holster with the safety turned on – and he might have added that in the case of nuclear weapons the “safety” is locked in place by a combination lock that can only be opened and firing made possible if the soldier carrying the pistol receives a message from his chain of command giving him the combination.

Whatever other problems the current nuclear posture of the US nuclear force may present, it cannot reasonably be said to be on a “hair trigger.” Since the 1960s the US has taken a series of measures to insure that US nuclear weapons cannot be detonated without the receipt of both external information and properly authenticated authorization to use that information. These devices – generically Permissive Action Links or “PALs” – are in effect combination locks that keep the weapons locked and incapable of detonation unless and until the weapons’ firing mechanisms have been unlocked following receipt of a series of numbers communicated to the operators from higher authority. Equally important in the context of a military organization, launch of nuclear weapons (including insertion of the combinations) is permitted only where properly authorized by an authenticated order. This combination of reliance on discipline and procedure and on receipt of an unlocking code not held by the military personnel in charge of the launch operation is designed to insure that the system is “fail safe,” i.e., that whatever mistakes occur, the result will not be a nuclear explosion.

Moreover, in recent years, both the US and Russia, as well as Britain and China, have modified their procedures so that even if a nuclear-armed missile were launched, it would go not to a “real” target in another country but – at least in the US

case - to empty ocean. In addition to the basic advantage of insuring against a nuclear detonation in a populated area, the fact that a missile launched in error would be on flight path that diverged from a plausible attacking trajectory should be detectable by either the US or the Russian warning systems, reducing the possibility of the accident being perceived as a deliberate attack. De-targeting, therefore, provides a significant protection against technical error.⁵

These arrangements – PALs and their equivalents coupled with continued observance of the agreement made in the mid-90s on “de-targeting” – do not eliminate the possibility of technical or operator-level failures, but they come very close to providing absolute assurance that such errors cannot lead to a nuclear explosion or be interpreted as the start of a deliberate nuclear attack.⁶ The advantage of such requirements for external information to activate weapons is of course that the weapons remain available for authorized use but not susceptible of appropriation or mistaken use. The drawback from a deterrence and operational point of view is, of course, that the system for transmitting the information must not be susceptible of interruption – that is, there must be assurance that an authorized decision maker will be able to act and have the decision – and the accompanying authenticated orders and unlock combinations – communicated to and received by the operators of the weapon systems. Accordingly, a system of combination-locked safeties requires a highly survivable network for decision and communication with the operators. Otherwise there would be pressures for early transmission of the codes, with their insertion subject to a later execute order or even more dangerous, pre-delegation of authority to issue the execute orders. In this, as in other aspects of measures to meet the “never” requirement, a highly capable and highly survivable command and control system is essential.

To whatever degree this requirement of receipt of external information has gaps – and those gaps have been greatly reduced and arguably fully eliminated by now⁷ – the cure is filling in the gaps, not attempting some other means of preventing accidents. The goal should be that no US (or Russian) nuclear weapon can be armed – that is made capable of detonation – without both an order, properly authenticated, from a legitimate authority and the receipt of the codes necessary to unlock the arming and fuzing mechanism. Weaknesses in the locking procedures should be corrected, so that all nuclear weapons whatever their status or location are effectively locked. Moreover, the principle of a locking mechanism should be extended from the weapons to their launchers, to the degree that has not already been done. Historically, the early protections were directed at controlling detonation of the weapon, not the launch of the missile that carries it.⁸ There are, however,

⁵ De-targeting does not, however, obviate a ‘launch under attack’ (LUA) policy because the de-targeting arrangements are deliberately designed so that targets can be inserted into the force sufficiently rapidly enough to make LUA feasible.

⁶ The UNGA resolution welcomes “de-targeting initiatives.”

⁷ A major gap-filling measure has been the extension of the system to weapons on SSBNs.

⁸ It bears emphasis that control of the unauthorized use of nuclear weapons is not simply a technical matter. The absence of a physical lock is not equivalent to delegation of the use decision to the operational force. With or without external information being needed to unlock the weapon, there must be legitimate and authenticated, authorization of the launch. The fundamental military principle of discipline and obedience to –

risks of an inadvertent, or at least unauthorized, launch of a missile being mistaken for the start of a “real” attack even if in the event, no nuclear detonation would result.⁹ Accordingly, to the extent missiles could be launched without receipt of external information – albeit with non-detonating weapons -- a priority area for further protections is imposing requirements for external information for the activation of the launch mechanisms analogous to those already in place for the fuzing mechanism.

The description above relates only the US arrangements. Russian officials declare that Russia has imposed similar procedural and technical safeguards but the details – and the process in other countries – are largely unknown and clouded by unofficial speculation. Greater transparency concerning command and control arrangements and cooperation on control technologies would be an important contribution to reducing the risks. And such transparency is consistent with a high degree of security and reliability in the deterrent force. Even in the Cold War, the US consciously took action to make available openly to other countries the basic technology necessary for introduction of PALs into the control systems of nuclear weapons. A useful measure of insuring that “alert” weapons are “safety-ed” would be an exchange of information among nuclear weapons states regarding these technologies.¹⁰

My basic point is that the answer to the supposed “hair trigger” problem is to fix the triggering mechanism by building in safety mechanisms, which can be done without compromising the deterrent capacity of the forces. Other measures – notably operational disablement by such actions as separating the weapons and the launchers – are unnecessary to protect against unauthorized use,¹¹ and they have highly dysfunctional effects on other, almost certainly more significant, parts of the problem of avoiding nuclear use. Specifically, as outlined in detail later in this paper, the need to reverse these measures to return to an effective deterrent posture in a crisis would almost certainly have the effect of deepening the crisis and making nuclear over-reaction more likely.

Custody Failure

Turning next to Custody Failure – the same requirements for external orders and information that protect against pure accidents will also provide protection against a take-over of the weapons, whether by their own crews or some outside elements. Here again, however, there is likely to be room for improvement. The early PALs

and requirement for – superior orders is in a basic sense as much a part of the system of control of unintended use as any technical measures.

⁹ As noted above, de-targeting has some potential to reduce these risks. However, it is not clear that all nuclear powers that have the capability to detect a launch also have the capability to calculate its target with the speed and accuracy required to insure against misinterpretation.

¹⁰ It would, in principle, be possible to reduce the consequences of accidental or unauthorized launches by building “command destruct” mechanisms into missiles. In addition, one of the advantages of limited ballistic missile defenses is their capability to be employed against accidental or unauthorized launches.

¹¹ Many of the additional “de-alerting” measures advocated to prevent unauthorized, accidental attacks do nothing to deal with the problem of a launch of a missile without a working warhead. This is the case in particular for restricting submarine patrol areas, removal of fuzing mechanisms, and remote storage of weapons.

systems were intended primarily to prevent a usurpation of authority by the operators. The relatively simple arrangements for blocking arming signals could, with expertise, time, and undisturbed access, be by-passed. As concern with theft by outsiders grew relative to concern at unauthorized or mistaken action by the military crews in immediate possession of the weapons, the US has developed new generation anti-tampering control devices that are designed not simply to block immediate fuzing but to render the weapon ineffective if someone without proper authority attempts to bypass the “safety.” These anti-tamper measures should be pressed forward because, in addition to dealing with accidents or misinformation, they address theft and diversion which, under current conditions are almost certainly more serious problems.

Launch Under Attack Failure

The advocates of de-alerting focus their criticism (if not most of their anecdotes) on a highly legitimate target – the dangers inherent in a decision to launch a “retaliatory” attack *before or during* an anticipated or perceived incoming attack. Both the United States and Russia have stated, more or less explicitly, that in the event their supreme authorities concluded that a major attack was underway, or perhaps even if they judged such an attack was about to happen, they have – and might well exercise – the option of launching a responsive attack before the first incoming weapons struck or, conceivably, even before they were launched.

The US has drawn a conceptual distinction between “Launch Under Attack” – (LUA) – meaning a responsive attack ordered after confirmation that a major attack is actually in progress and “Launch on Warning” – (LOW) – meaning an attack ordered on the basis of a determination that an adversary was committed to a nuclear attack on the US, but before that attack had actually started. US declaratory policy has focused on the retention of the option of LUA.

The distinction between “before” and “during” is non-trivial. There is a big difference between definite confirmation that launches have started and the most credible evidence of preparations for an attack. Moreover, there is probably some significant deterrent effect if the adversary recognizes the possibility that an intended first strike will in fact find many of its targets already launched, vitiating any hope that the first strike will reduce the counterblow to tolerable levels. And the policy has some technical plausibility. The US missile launch detection system would very quickly both detect launches, thereby confirming that an attack had started, but also provide considerable information about the scale and shape of an attack.

However, a LUA policy entails very great risks. There are limitations on the capability of the US warning system and very real questions about whether the Russian warning system is even approximately equal to the American in capability rapidly and accurately to assess events.¹² Moreover, on both sides, given the short

¹² In this context, however, it is relevant to distinguish between incidents – such as the Norwegian sounding rocket launch in 1995 – where the Russian warning radar detected an event, resulting in some degree of alert for the overall Russian nuclear complex, but promptly and correctly dismissed any idea that an American (or other) attack was underway. The problem is not that detecting an ambiguous event increases readiness – it

times between initial launches and initial impacts, there could be substantial ambiguity about what was actually going on – and there would certainly be essentially no opportunity to tailor a response.

The drawbacks of a posture in which LUA, much less LOW, is part of actual doctrine and planning, as contrasted to an irreducible theoretical possibility, are severe. Most important, in the case of LUA, the time for decision and communication of orders would be drastically compressed.¹³ The flight time of a ballistic missile over the North Pole between Russia and the United States is barely 30 minutes. That interval is therefore the absolute maximum period of time the target country would have to detect the incoming attack, assess the validity of the information, reach decisions on the action to take, process the orders and codes necessary to launch a response, transmit them to the deployed forces, have them received, understood, and implemented, and, finally, have the missiles launched on the way to their targets. Indeed, relatively straightforward measures – such as positioning submarines much closer to the target country to launch precursor attacks on command and communications facilities could drastically shorten the time available.

From the point of view of people who are – rightly – concerned about mistakes, LUA, much less LOW, is a terrible idea. The risks of misinterpretation of ambiguous information, the potential for an excessive response, the foregoing of any opportunity to assess the damage before deciding on response – and the pressures for pre-delegation with corresponding risks of dispersed mistakes – all are immense. Fortunately perhaps, the strictly military disadvantages are at least as great: If the “de-alerters” worry that the orders would be wrong, the military planners worry that they would not get through at all, that the sequence from detection to execution simply could not be accomplished in the time available, especially if the adversary attempted to interrupt the process at vulnerable stages along the way – as any adversary facing an opponent that relied on LUA would have be presumed to do. From a strictly military point of view, a LUA doctrine is highly unsatisfactory precisely because the LUA process is itself so vulnerable.

Why then would any nation rely on or even plan for LUA (or its equally problematic cousin LOW)? One answer is that there may be some deterrent value in reminding an adversary that the option inherently exists. (As with the Catholic bishops perception that a threat may have some deterrent value even if one does not in fact intend to carry it out, so long as your reservations are undetected.) Far more serious is the situation in which a nation decides that unless it “responds” before being hit, it may not be able to respond effectively at all. That is to say, the incentive for *relying* on LUA (as contrasted simply to declining to renounce a capability that is inherent in

should, if only to maximize the chances that the event will be correctly understood. The danger is a more specific one – that the surveillance systems will not resolve the ambiguity fast enough.

¹³ LOW, on the other hand, would permit more time for deliberation, but would, by definition, involve taking the momentous decision to initiate a major nuclear war on the basis of necessarily contingent information about the state of the adversary’s intentions and preparations. However concrete that information it would by definition be less conclusive than an actual attack being underway.

almost any nuclear posture) is the fear that one's own nuclear forces are highly vulnerable to an initial attack.¹⁴

Accordingly, many of the de-alert proposals seek to deal with the risk of LUA by measures that have as their goal making a very rapid anticipatory attack physically impossible.¹⁵ Hence proposals to separate warheads from their launches, to bury silo covers, to keep submarines out of range and the like. However, there is a serious argument that taking such measures to impose physical limits on the victim's ability to respond constitutes a cure potentially more dangerous than the disease. First, they not only insure against a launch before impact; they would make any response after impact far more difficult, weakening deterrence.¹⁶ Thus, they constitute a self-imposed vulnerability and an invitation to pre-emption. Moreover, these measures are, by design, reversible. Warheads can be reinstalled, silo doors uncovered, submarines moved into range. But these reversing steps are susceptible to interruption, to some extent even with non-nuclear means. Warheads will be exposed while being moved from wherever they are stored back to their launchers, machinery clearing silo doors will necessarily be operating in the open, submarines moving hundreds of miles from their out-of-stations can be tracked and attacked. And in any context in which a state would seriously consider LUA (or indeed any other use of nuclear weapons, however leisurely and reflective the decision process) the one thing it would want to insure is that it was not at a disadvantage in the reconstitution process. Measures that create a necessity for competition in mobilization for confidence in deterrence are highly risky.

It follows that the appropriate answer to the LUA problem from both the military and the stability/safety point of view is not to try to make LUA physically impossible, but to take two mutually re-enforcing steps – one technical and one doctrinal – to make it unnecessary. The technical step is to remove the vulnerability by so designing and operating nuclear forces that the victim of an attack is highly confident that it will have effective options after absorbing an attack. The doctrinal step is to establish a clear strategic policy that abjures reliance on LUA (much less LOW) and requiring the military to shape its plans and its forces consistent with that principle.

With respect to the first element – reducing vulnerability -- the US has expended huge amounts to insure that its forces are not so vulnerable as to make reliance on LUA necessary, much less preferable. Most notably, a substantial part of the US nuclear capability resides in submarines that, once at sea, are essentially

¹⁴ In some respects, the impetus for reliance on LUA is driven by a belief that a very large target set must be destroyed, less to assure accomplishment of the deterrence mission, than in some attempt to achieve a traditional military result by shifting the post-exchange military balance. With nuclear weapons that is a highly dubious objective and a more realistic doctrine for defining what target coverage it is essential would reduce the pressures for retaining LUA as a necessary option.

¹⁵ The “de-alerters” talk about “hair trigger” is probably best understood as a reference to the fact that LUA would require very rapid execution.

¹⁶ Arguably, proposals to keep SSBNs in out of range patrol areas are less subject to this objection. In principle, the subs would survive the initial attack and could thereafter move in range. However the requirement for the SSBNs to move -- presumably at high speed -- would increase the risk of detection by the other side. The sort of measures necessary to verify that patrolling submarines were in fact out of range under “normal” conditions would inevitably tend to increase this risk.

undetectable.¹⁷ But submarine basing is not the only measure the US has taken to try to achieve a posture of very low vulnerability. The nuclear command and controls system has been designed to be sufficiently redundant and hardened as to be able to operate – in an admittedly degraded but still effective state – even after an attack. Since at least the 1960s, the US has made it a basic principle of its declaratory deterrence policy that its forces are sufficiently secure and survivable that no conceivable adversary's attack would deprive the US of the ability to launch a response so powerful as to deny an advantage from a first strike.

The doctrinal issue is less clear-cut. LUA has, in US doctrine, been more than simply a theoretical possibility of some deterrence value. Ambitious target coverage goals related to war-fighting objectives have played a key role. By definition, an unimpaired force will be capable of covering more targets than one that has received an initial blow. Moreover, there is a tendency to define target coverage goals by the capabilities of the full force, not its survivable elements, and this tendency to permit maximum capabilities to define sufficiency creates pressures to rely on LUA to meet the goals. But the destructiveness of nuclear weapons is such that it is hard to credit the idea that deterrence requires more destructive capability than a well-designed, well-operated survivable force would have.¹⁸ For many reasons – avoidance of the need for dangerously compressed decision times being only one of them – the US should revise its targeting doctrine to bring targeting “requirements” within the capacity of the survivable force.¹⁹ That doctrinal change will facilitate explicitly rejecting reliance on a pre-impact response as a matter of military policy and practice.

It seems likely that Russian reliance on LUA is based at least as much on unrealistic war-fighting concepts as is the case in the US. However, Russian commentators sometimes argue that Russia does not have and simply cannot attain a similar degree of invulnerability and therefore cannot be expected to renounce some form of LUA.²⁰ These claims should be taken with a very consider dose of salt. The military

¹⁷ Interestingly, Britain and France have similarly recognized that by far the best way to assure that their relatively small nuclear forces can carry out their deterrent mission is to base their nuclear weapons almost entirely on submarines.

¹⁸ Historically, a great many of the targets were regarded as contributing to a damage limitation or war-fighting mission. Whatever may have been the case in the past, for both sides the development of highly survivable forces capable of immense destruction has made that mission infeasible.

¹⁹ In theory, forsaking reliance on LUA to meeting essential target coverage might require increasing the size of the survivable force. In practice, this seems unlikely – but even if it were the case, such action would increase stability and be worth the price.

²⁰ In the de-alerting context, this argument from Russian vulnerability faces an inherent self-contradiction. Measures such as warhead separation that would make rapid elevation alert levels more difficult without making it less necessary for deterrence, would seem likely to be less, not more, acceptable to the Russian side, if they continued to count on strategic warning. If the Russian force is so vulnerable as to leave Russia with no alternative to LUA, it is not likely that Russia would ever accept measures designed specifically to deny it that option. Of course, some advocates of making LUA impossible may believe that if the US unilaterally adopted measures along these lines, Russia would be reassured and risks thereby reduced even as Russia retained a LUA posture. To be sure, there is a theoretical argument that a unilateral US elimination of the possibility of LUA would in a crisis reduce the incentives for pre-emptive action by Russia by reducing the supposed threat of a US first strike. However, it is, to put it mildly, highly unlikely the US would agree to self-imposed, unilateral reductions in survivability in the hope Russia would be mollified – rather than seeing it as an

disadvantages of depending on LUA are every bit as applicable to Russia as to the US. Nor has Russia (or the USSR) actually ignored survivability in designing its force. Russia has, like the US, built and continued to modernize submarines that carry a substantial part of the nuclear force. She has also (unlike the US) deployed mobile ICBMs, exploiting the vastness of Russian territory (and, arguably, greater ability of the government to appropriate land for military use). Even more than the US, Russia has built highly survivable command facilities.

To be sure, a much smaller – though still not negligible – part of the Russian SSBN fleet is normally on patrol and the mobile missiles mostly stay in garrison in normal times. But it does not, however, follow from these accurate observations about Russian operational practices that Russia needs to rely on LUA to avoid a disarming US strike. The decision to maintain relatively low – but far from zero – day-to-day readiness is a choice not an inevitability.²¹ One suspects that it is a choice driven in large part by a realistic judgment that a serious prospect of use of nuclear weapons would arise only in the context of a growing crisis, permitting ample time to raise alert levels. For a variety of reasons, the USSR – and now presumably Russia – has proved more willing than the US to count on response to strategic warning. In the dynamic of a crisis, however, it would be dangerous – to Russian interests as well as everyone else's – for such increased alert levels to be essential. Future arms control measures – as well as consultations on practices, procedures, and doctrines to reduce nuclear risks – should address steps that would facilitate high levels of survivability on both sides that do not depend on urgent mobilization in crisis.

So long as the US and Russia remain to any significant degree convinced they must plan against the possibility of a need to deter each other,²² the answer to reducing the dangers associated with a prompt response doctrine must lie in increasing the survivability of a force large enough to assure that the most effective possible first strike would not prevent a wholly intolerable level of destruction in response.

Information Failure

The development of nuclear weapons and the massive advances in information technology have by no means eliminated the fog of war – or the fog of pre-war intelligence. The problems to which de-alerting proposals are directed have to do centrally with assessing ambiguous information, that is with correctly understanding observed phenomena and, in particular, distinguishing actual attacks from other events.

opportunity. But even leaving aside the political implausibility of any such US action, such an arrangement would be unwise because the hypothetical US self-denying measures are reversible and Russia would still be potentially vulnerable unless it took the initiative to interrupt the US reversal efforts – hardly a formula for reducing nuclear risks.

²¹ To the degree a low readiness posture was driven in the 90s by economic considerations, the revival of the Russian economy should make a more survivable posture feasible – as, unfortunately, a more assertive international policy may make it more relevant.

²² It may be true, of course, that there is no real possibility of US-Russia relations deteriorating to the point where either would consider an attack by the other a sufficiently realistic possibility to be worth deterring. But to conclude that is the case is simply to assume away the nuclear problem.

It seems to be the conventional wisdom that US warning systems are considerably better than Russian.²³ But whatever the relative capabilities, there is a strong case for cooperation in exchanging information.

Even during the Cold War, the superpowers were able to agree on the so-called Hot Line – a relatively primitive system for exchanging information in a crisis. In the years after 1991, a number of proposals were put forward, and even agreed in principle, for greatly expanded data exchange. For the most part, nothing much has been accomplished in this regard, partly because of general deterioration in overall relations and partly because of lack of senior level willingness to overcome real, but manageable, practical issues like procedures for bringing the necessary equipment into place without payment of import duties.

Both sides have a strong self-interest in rapidly resolving ambiguities and uncertainties. The most direct and most satisfactory way to do that is by setting up mechanisms for cooperating in exchanging information. The UNGA resolution declares that measures such as the proposed US-Russia data exchange center “can play a central role in operational status reduction processes.”

Crisis Failure

Most conventional de-alerting ideas focus chiefly on stopping a technical or operational level malfunction from resulting in a nuclear detonation and making day-to-day rapid execution of a nuclear attack impossible. These are, however, the less likely and less dangerous parts of the nuclear challenge and measures that address them by, in the UNGA resolution terms, “reducing operational readiness” without considering the dynamics of a real crisis risk ignoring, or even exacerbating, what seem to me to be far greater dangers. The central task of nuclear policy is to avoid nuclear war – and the chances of such a war are overwhelming greatest in the context of a general crisis. There are plenty of historic examples of tactically successful surprise, but very, very few examples of strategic surprise, that is of true “bolt from the blue” aggression wholly divorced from growing political tensions and lower level conflict. During “normal” times, it may be appropriate to give priority to safety, security -- and economy – over deterrence,²⁴ but that calculus changes in a crisis. Actions that are geared to relatively benign day to day conditions and that amount to disabling the weapons systems operationally do not take into account their implications of these measures in crisis that are, in such conditions, likely to produce side-effects that are highly undesirable.

²³ Paradoxically, the risks of mistaken action are lowered not just when warning and surveillance systems are highly capable, but also when they are virtually non-existent (as is essentially the case for all nuclear weapons states except the US and Russia – and perhaps Israel in respect of the limited geographic region from which threats to it might plausibly originate). It is the warning systems good enough to set off alarms without being capable of rapidly resolving ambiguities that are most problematic.

²⁴ Even during the Cold War both the US and the USSR, but especially the latter, did exactly that – only a fraction of the bomber force (almost none in the Soviet case) was kept ready for prompt take-off, most SSBNs were in port, and tactical weapons were mostly in storage. Since 1991, levels of alert have declined drastically on both sides.

Greatest of these is the danger that in a crisis, one side (or both) would become convinced that the risk of a nuclear attack was increasing and indeed reaching the point where a decision to authorize a nuclear attack could be required.²⁵ The dangers of war by technical accident or even by erroneous and ill-considered response to a mis-perceived actual attack are greatly outweighed by the danger of war by strategic or judgmental error.

Specifically, if the nuclear weapons systems on both sides have been operationally disabled, so that as long as they remain in that state they cannot, even if properly authorized, execute an order to fire, there would be strong pressures to reverse that disablement – in traditional military parlance, to mobilize. The process of mobilization, of moving from a peacetime conditions of operational disablement to a wartime footing of operational readiness, can have serious implications for restraint. Most serious of those implications is that there would not only be pressures to mobilize; there would also be pressures to mobilize first – and, indeed to strike first before the other side's mobilization was complete.

Consider what would happen in a growing crisis if such measures as separation of weapons from their launchers, removal of other critical components, exclusion of submarines from in-range ocean areas, or piling dirt on top of silo doors were in effect as the crisis started. All nuclear powers – perhaps even those only peripherally involved – would be under heavy pressure to start immediately on a rapid restoration of the very readiness posture that the de-alerting measures were designed to frustrate. By definition, the verification measures in place to provide assurance that operational readiness levels were low would make it abundantly clear that alert levels were being restored. The resulting race to readiness would have profoundly destabilizing effects, making the crisis the more acute and harder to control.

Historical, non-nuclear precedents like the mobilization race of the summer of 1914, the failure of Stalin to respond to clear indications of German preparations in June 1941, or the buildups before the 1967 and 1973 Arab-Israel wars testify to the way in which preparations create pressures for counter preparations and set off a dynamic in which restraint is both psychologically and operationally both difficult -- and potentially dangerous. During the Cold War, both the US and the USSR recognized the significance of increased nuclear alert levels – how much more dangerous would that dynamic be if the issue were not increasing an already high level of readiness, but the possibility of a decisive advantage flowing to the first to reacquire a capability to use nuclear weapons, a fleeting, but potentially crucial, nuclear monopoly.²⁶

It is no answer to say that in the post-1991 world, there will be no such crises. If there are no crises – and the problems of true technical or operational accident are

²⁵ This dynamic is, of course, related to the LUA problem, but it is more general for it deals with all the factors that could tend to contribute to a cycle of escalation, and these may fall far short of a specific conviction that nuclear attack is imminent much less that it has actually begun.

²⁶ Admittedly, almost any “never” measures have some potential to induce toward actions in a crisis that could be perceived as escalatory. The point is, however, to avoid increasing the need for such actions -- and in particular to avoid those that are necessary to have any deterrent capacity, not simply to add to an already ample capacity.

handled as they readily can be by command and control measures such as those outlined above – then there are no nuclear risks. But that is simply not the case. So long as sovereign states with armed forces exist outside a comprehensive system of world order there will be a risk of escalating crisis. As more and more countries acquire nuclear weapons, there will be a correspondingly greater risk that these crises will have a nuclear dimension. And for all the confident hope that the day of US-Russian confrontation will not return, and that the day of US-China confrontation will not come, it would take tremendous optimism to conclude that there is no possibility of a crisis between two major nuclear powers.²⁷

The key to controlling these, in my view far more substantial, risks is virtually the opposite of the usual de-alerting prescriptions. Paradoxically the best way to avoid having nuclear preparations deepen a crisis is to insure that such preparations are unnecessary, or at least that they have no fundamental effect. What makes such a mobilization race dangerous is the fear that losing it will leave the loser in a decisively disadvantageous position. If, however, a state has high confidence that no amount of mobilization by others will produce a significant advantage, the mobilization process will be vastly less dangerous.

The way to limit the – all too real – risks of pressures for either competitive mobilization (just as to reduce pressures for a rapid response if an attack is detected) is to assure that forces with a capacity to deter – so long as deterrence is possible – are ready and will survive any conceivable attack. A nuclear power can be relatively indifferent to the other side's mobilization if it has operationally ready systems that are invulnerable to pre-emptive attack and sufficiently powerful to pose to an attacker an unacceptable level of loss. This condition can be achieved for the very important case of crisis stability, while also increasing protection against other potential types of failure by the combination of survivable launchers; robust, survivable, and redundant communications links to them; and requirements for both properly authenticated orders and receipt of externally-held codes for an attack to be launched. These measures are consistent with “operational readiness” in the sense that enough nuclear weapons to meet essential national requirements are always on “alert” so that they can be ordered to execute at a time chosen by the legitimate command authority without any need to act before being struck, is, in a crisis, a factor for stability rather than the reverse.

²⁷ Moreover, even a crisis involving states with far smaller nuclear forces – e.g., the US and a nuclear armed DPRK – would have a nuclear dimension.