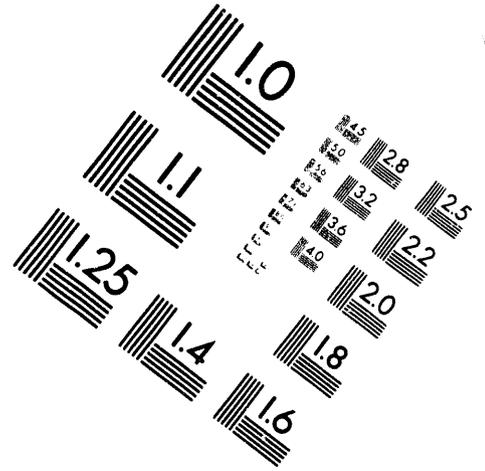
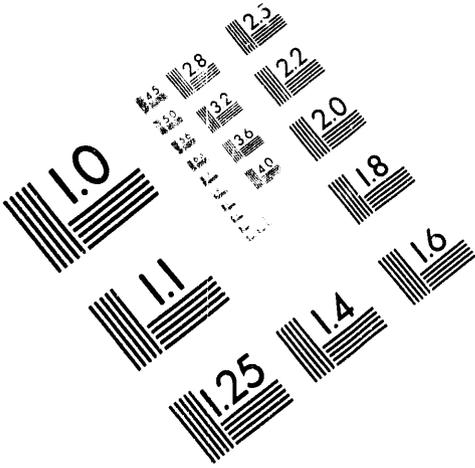




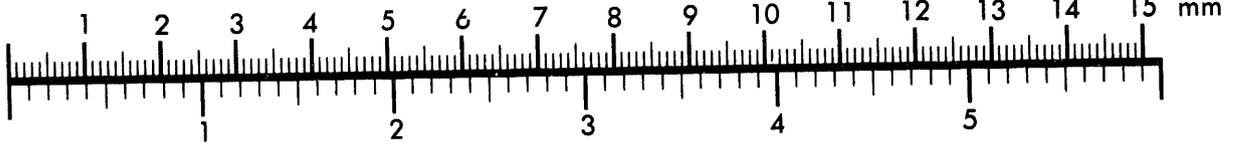
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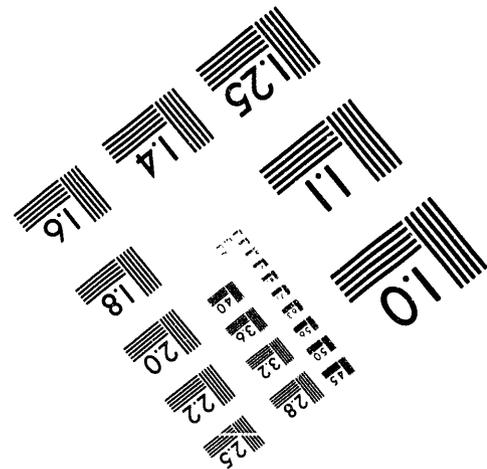
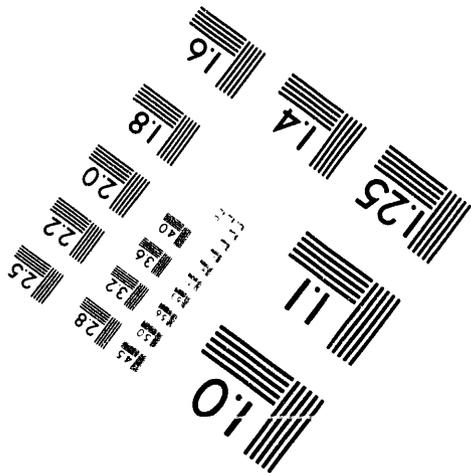
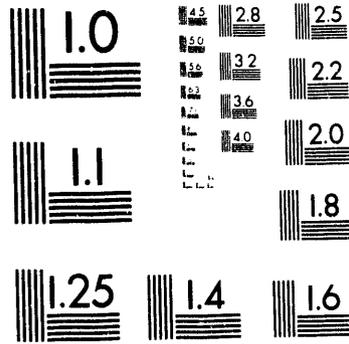
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Managing Nuclear Weapons in the United States

George Miller

Lawrence Livermore National Laboratory

March 16, 1993

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Lawrence Livermore National Laboratory
University of California, Livermore, California 94551

MASTER

Managing Nuclear Weapons in the United States

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When I was trying to collect my thoughts for this talk, I turned to my staff for some good ideas and they said, "Your first problem is that the title of your talk is an oxymoron, and the title of the conference is an oxymoron. Given all that is happening in the world today, it is impossible to manage anything." So what I hope to do in this talk is bring some semblance of order to all that is taking place by presenting some themes that are true for me as I look this changing world.

First of all, I think it is a world of tremendous hope and opportunity. We have seen the end of the Cold War, the demise of the Soviet Union, and the beginning of fledgling democracies in an area of the world that has been repressed for over 70 years. However, these events have also brought an end to the consensus policies of containment and deterrence, which were our guiding lights in the 40 years of the post-World War II era.

We are hopeful about the future, but we are also mindful of the continuing dangers. The

changes in the superpower relationship and the break-up of the Warsaw Pact countries have resulted in a loss of what I call "enforced stability." Although oppressive, the Cold War was at least stable and predictable. On a daily basis, we are mindful of the growing importance of: (1) the instability in the former Soviet Union and, therefore, the instability of its nuclear weapons enterprise; (2) the ethnic strife in the former Soviet Union; and (3) the Third-World economic wars, religious differences, and ethnic problems. We have all been reminded of the problem of nuclear proliferation as a result of the revelations about Iraq's nuclear program. We have also seen major progress in arms control, both negotiated and unilateral. It is possible that by the end of the decade we will see almost a tenfold reduction in the number of nuclear weapons held by the United States and the former Soviet Union.

The United States' Part in the New World Order

After the Middle East war, President Bush defined what he called a new world order in which new ways of working with other nations would result in the peaceful settlement of disputes, solidarity against aggression, reduced and controlled arsenals, and the just treatment of all peoples.

Those were very hopeful words, but if we look below the surface, we find there is no clear view of what this new world order is, how it can operate, or what role the U.S. plays in it. It is clearly in the best interest of the U.S. to have a stable, peaceful world; the issue is how we bring this about.

America-First Syndrome

We are also concerned, as we read the articles and editorials in our newspapers, about what I will call the "America-First Syndrome," that is, a tendency to withdraw back into ourselves; in many respects, to go back to the way it was before the world wars, to consider our own needs before we consider the needs of the rest of the world. We must realize that the U.S. cannot withdraw because we have some very special responsibilities.

Today we are the only real military superpower, and we continue to be one of the world's major economic powers. Whether we like it or not, we are usually the dominant player in multinational institutions. What I conclude is that nuclear weapons are going to be around for awhile and that nuclear deterrence will continue to be a key element of U.S. national security policy, but that the nature of deterrence is going to change.

Economic *versus* Defense Issues

The second major issue in front of us is a shift of our security focus from defense issues back to economic issues. In many respects, we are returning to the period before World War II, but the world is not the same. The primary emphasis in the presidential campaign was on the domestic economy with relatively little discussion of defense issues. We found that both the Clinton and the Bush proposals called for cuts in the defense budget. There were differences in detail, but the proposals were quite similar.

World and U.S. economic problems will be a continuing issue. How can we make sure that the U.S. continues to play a leadership role? What will be the impact of the economic competition with Japan and the European Community? Will it be confrontation or cooperation? Our hope is that we will be wiser than we were in the earlier part of this century. Many people have pointed out that, in addition to economic problems, there are other "transnational" problems on which we must focus, problems of the environment and energy supply.

In a recent monograph, Ash Carter, Bill Perry, and John Steinbruner¹ said, "One can prudently

presume that major biophysical constraints will be encountered having to do with the composition of the atmosphere and with the cycling of basic nutrients and toxic chemicals. These matters are capable of giving the familiar phrase 'vital interest' a far more compelling meaning than it had previously. Within a decade, vital interest of this sort will probably begin to alter the international security agenda. Conceivably within four decades, the span of the Cold War, such vital interest will absolutely dominate our thinking."

What we are concerned about, the directions that we are going, and the ways in which we are tied to other nations in this world are changing. There is obviously a desire for a peace dividend, which leads to suggestions of even more drastic cuts in the defense budget. However, we must remember that investment in defense and an active international presence by the U.S. are in our national security and economic interests. The two are, in my view, irrevocably intertwined, so we must have both a strong defense and a strong economic policy in ways that we have not completely come to grips with.

Reevaluating Deterrence

The whole concept of deterrence must be reevaluated. We are witnessing a shift from a regime in which the perceived dangers were relatively familiar (and, in many senses, relatively simple) to a regime in which the dangers are quite complex and not so clearly identifiable. In this environment, we need an integrated view that couples arms reductions, weapon improvements, weapon acquisitions, force restructuring, and the problems of proliferation. All of these regimes must be integrated in a way that allows us to understand these complex problems.

Many people believe that in this environment nuclear weapons will be relegated to the background. In the monograph by Carter, Perry, and Steinbruner,¹ they said, "Relegation of nuclear weapons to a background role in international security, reduction of active arsenals, and dismantlement of the surplus, enhancement of the safety of remaining weapons, and nonproliferation are becoming parts of one security problem." In that

context, I think it is important to realize that there are very different views of what deterrence is and what our deterrence strategy ought to be.

A major conclusion of the September 1991 study by the National Academy of Science² states that nuclear weapons should serve no purpose beyond the deterrence of and the possible response to nuclear attack by others; that is, the only purpose of nuclear weapons is to deter nuclear weapons. In almost the same time frame, Tom Reed³ concluded in a report to General Butler of the Strategic Air Command that the U.S. should reject the thesis that the only purpose of nuclear weapons in the new world order is to deter nuclear attack. For me, this issue was most clearly, and simply stated by Mike May⁴ in a talk he gave at the University of Chicago almost 20 years ago in which he said that "the role of nuclear weapons is to induce caution in the way countries deal with one another." It is a mistake to be too specific about precisely what the role of nuclear weapons

is other than to say they provide a framework in which nations deal cautiously with one another. There are multiple ways in which the world can degenerate into a very chaotic state, and so, in a sense, nuclear weapons provide a backstop.

Heated discussions occur when we try to reduce these ideas to operational concepts. What does the military do? What are the weapons? What are the force structures? The thesis becomes much more complicated, and the questions and the answers are not simple or straightforward. Thus, there are several questions that we must ask ourselves today. What deters the Third World? What deters other nations that have nuclear weapons? Are the Third World nations deterred by the traditional notion of holding things they value at risk? Were there things in Iraq that we could have held at risk that would have deterred Saddam Hussein?

In an article by Mike May and Roger Speed,⁵ "Should Nuclear Weapons Be Used?" they expressed concerns about low-yield nuclear weapons and war fighting in the future. They expressed concerns and reservations about the use of nuclear weapons in regional conflicts lest the planning to do so legitimize the use of nuclear weapons and counter our desire to pursue goals in the nonproliferation area. These issues are not simple, they are intertwined, and what we do affects what others do; I think that this is one of the most important lessons that we should have learned from our competition with the former Soviet Union. What matters most is what the former Soviets find threatening, not what we think is threatening. Therefore, we have to understand in a much more rigorous fashion what is important to other countries in order to decide what to do in our own country.

Other Nuclear Weapons Issues

We will have to deal with other questions that include: What weapons will the U.S. keep as it reduces its stockpile to 3000–3500 weapons? In the near term, they will be a subset of the weapons that we already have. Is that appropriate? What force structures make sense? Do we want a triad, as we currently have with its inherent stabilities, or should we move to a dyad or a monad, which would be less costly? What will our targeting policy be? Do we continue to require the ability to attack hard targets? In the context of an uncertain future, where it is difficult to define a clear enemy, what kind of forces do we need? What is the value of flexibility as we move into the future?

With regard to European security issues and to the very special role that U.S. forces have in the eyes of the Europeans, our long-term goal is to

eliminate the incentive for other European nations to develop their own nuclear weapons. There is value in having U.S. nuclear weapons deployed in Europe if it contributes to that goal.

What follows the Strategic Arms Reduction Treaty (START) and the unilateral statements that were agreed to by Presidents Bush and Yeltsin? Can we reduce the number of nuclear weapons to 1000–2000? How low can we go? What are the determining factors?

The U.S. has placed an increased emphasis on the safety, security, and reliability of its forces. In many respects this is because the public toleration for risk, particularly for things nuclear- or defense-related, is declining. We must also worry about the problems of proliferation, terrorism, and nuclear blackmail.

Planning for an Uncertain Future

As I pose all of the above questions, I ask, "Okay, it is a neat list of questions, but what are the answers?" I do not come up with simple answers. Therefore, as I integrate these issues and uncertainties, I conclude that the U.S. must continue to have, as an important part of its national security policy, a safe, secure, reliable, and flexible (although very much smaller) stockpile of nuclear weapons. The purposes of these weapons will be

to induce caution in international actions and to provide hedges against a very uncertain future. The only way to plan for an uncertain future is to have the flexibility to respond.

In my role, the question I must ask is, given the fact that deterrence is likely to change, is there a role for technology? What can we do to help the country come to grips with the problems that it faces? The safety, security, and reliability of the

nuclear forces must be absolutely unquestioned if we are to retain viable forces. The first premise to being able to have nuclear weapons is that the public has confidence in them—that is really what I mean by safe, secure, and reliable.

The House Armed Services Committee commissioned a special review⁶ of nuclear weapons safety by Stanford University Professor Sid Drell about two years ago. The Drell panel concluded that unintended nuclear detonations present a greater risk than previously estimated for some warheads in the stockpile. They recommended that we provide upgrades, including technological features such as insensitive high explosives, enhanced electrical systems, and fire-resistant features to provide the most modern capability for the weapons that remain in the inventory. The panel also recommended research and development on designs that are as safe as reasonably achievable. This is not a statement that the weapons we have today are unsafe; it is a statement of the standards by which the public will judge acceptability in the future. If we are to retain the capability of having a deployed stockpile, we must meet the expectations of the public.

Another area that has received increasing emphasis is nuclear weapons security. As we move into the future, our weapons should be fail-safe in the sense of being terrorist-proof. That is, if we lose physical control of some of our weapons, no terrorist group or nation should be able to exploit that weapon and operate it in its intended mode. The weapons should render themselves automatically unusable for extended periods of time if unauthorized use is attempted. A simple way to think about this is that we must make our nuclear weapons so that they cannot be "hot wired."

A prime responsibility of our Laboratory has been to maintain the reliability of the stockpile. In my view, as the number of weapons and weapons systems is reduced, the complex mechanism by which we maintain reliability, through extensive redundancy throughout the stockpile, will be lost. Therefore, the challenge of retaining confidence in the remaining systems will be even more critical. As you are all aware and as Livermore's Director John Nuckolls mentioned in his talk at this conference, the Hatfield legislation, which Congress passed this year, prohibits nuclear testing after 1996. This will severely restrict our ability to maintain the current high standards of reliability and safety to which the U.S. has become accustomed.

In addition to problems related to the force structure itself, we have major tasks associated

with the almost tenfold reduction in our deployed stockpile. This is a complicated problem. Some of the issues include: How do we reduce the stockpile with the current complex? What do we do with the special nuclear materials? How do we make these reductions in an environmentally acceptable fashion? Because many of these weapons were built 20 or 30 years ago, our ability to destroy them in a way that meets current expectations in terms of environmental impact is a very difficult proposition indeed.

The same problems are being faced by the former Soviet Union. The Nunn-Lugar legislation provided \$400 million of U.S. assistance to help dismantle the warheads of the former Soviet Union in a safe fashion. Our current weapons complex was designed to handle about 30,000 weapons. As we move into the future, this complex must be replaced by a very small, efficient, and environmentally acceptable means of servicing the smaller number of weapons that we will have in the U.S. stockpile.

The nonproliferation area also includes issues that are of great concern to us, but we are developing some tools to solve some of those problems. In particular, we are working to monitor and better understand what is going on in a country where we cannot get first-hand information about stolen or illegally made weapons. We must have the ability to respond to these types of emergencies.

Finally, a series of constraints complicates our ability to carry out what I have just discussed, but we must live with them. First and foremost are constrained budgets. We are required to do our job with less. We can do that only by becoming more efficient, by eliminating redundancies, by consolidating where appropriate, by working together, by being smart, and by carefully choosing and picking the things that we pursue.

From my vantage point, perhaps the most severe constraint is the Hatfield legislation. This law will make it difficult to accomplish the recommended safety and security upgrades and to maintain current high standards. We will have to develop a way to carry out the warranty we place on every weapon: that we are able to fix problems that we know will occur. Moreover, the Hatfield legislation imposes an additional constraint. It makes no provision to compensate for the loss of nuclear testing in terms of additional capabilities that might be required in other areas to make up for the loss of one of our very important tools.

Summary

The definition of what constitutes security is clearly changing in the U.S. It is now a much more integrated view that includes defense and the economy. Security is not a simple problem because the problem of defense is not simple any more. Our primary concern is no longer with the Soviet Union but is much broader than that. The world order is changing and, along with it, the nature of deterrence is changing. On the basis of the

changes that have occurred in the last few years, what kinds of forces—and what kinds of force structures—do we need to maintain the stability that we expect? We need a coordinated and integrated way to view all of these issues. Being a technologist, I am optimistic because I think that we are developing many valuable tools to deal with the new problems facing the United States in this changing world.

Acknowledgment

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