ANNEX 3-72 NUCLEAR OPERATIONS

INTRODUCTION TO NUCLEAR OPERATIONS

Last Updated: 19 May 2015

The Air Force's responsibilities in nuclear operations are to organize, train, equip, and sustain forces with the capability to support the national security goal of deterring nuclear attack on the United States, our allies, and partners. The primary purpose of US nuclear operations is to promote stability which results in:

- Deterring adversaries from attacking the United States and its interests with their nuclear arsenals or other weapons of mass destruction (WMD)
- Dissuading adversaries from developing WMD
- Assuring allies and partners of the US' ability and determination to protect them, thus obviating the need to develop or acquire their own nuclear arsenals
- Holding at risk a specific range of targets

Nuclear weapons are as important in 21st century global environment as they ever have been. Our nuclear deterrent is the ultimate protection against a nuclear attack on the United States, and through extended deterrence, it also serves to reassure our distant allies of their security against regional aggression. It also supports our ability to project power by communicating to potential nuclear-armed adversaries that they cannot escalate their way out of failed conventional aggression.

Paradoxically, while the number of nuclear *powers* has increased since the end of the Cold War, the total number of nuclear *weapons* has decreased. Yet, the number of nuclear-capable nations

> "Deterrence in the twenty-first century demands credible, flexible nuclear capabilities, linked to comprehensive strategies and matched to the modern strategic environment. That environment will continue to include nation-states with nuclear arsenals that could pose an existential threat to the United States. It will also include: multiple near-peer states with increasingly modernized nuclear capabilities that challenge regional stability; various nuclear aspirant states who resist global non-proliferation norms and whose emerging capabilities threaten U.S. allies; and non-state entities seeking nuclear capabilities. In the future, the flexibility and resilience of our triad of nuclear deterrent forces will continue to play an important role in strategic stability and underpin other tools of statecraft."
>
> -- *Flight Plan for the Air Force Nuclear Enterprise*

continues to grow. Fewer US nuclear weapons have forced a transformation in Air Force thinking and analysis, especially in a military environment that has grown more complex due to conventional capabilities, missile defense, and the proliferation of anti-access/area denial capabilities. Maintaining strategic stability will be an important challenge in the years ahead as both state- and non-state actors seek to acquire new capabilities or to modernize and recapitalize existing nuclear systems. Each nuclear actor brings their own decision calculus. Some actors may possess a limited ability, if any, to correctly discern US operations, detect changes in US posture, or recognize US intent. Likewise, US decision makers, including combatant commanders, subordinate joint force commanders, and commanders and staffs of Air Force components require understanding of both adversary and ally decision-making processes and behaviors. Nuclear operations in a proliferated, multipolar world is no longer reducible to a bipolar, Cold War paradigm.

This annex is arranged around the following key related topics:

- The section on "Fundamentals of Nuclear Operations" presents some discussion of the policies regarding nuclear weapons employment
- "Strategic Effects" presents discussion on the key effects of deterrence, extended deterrence, assurance, dissuasion, and defeat.
- "Presentation of Nuclear Forces" discusses organization and command relationships for Air Force nuclear forces.
- "Nuclear Command, Control, and Communications" presents information on processes and characteristics associated with command and control.
- "Planning Considerations" presents some high-level considerations on nuclear planning and the post-strike environment.
- "Nuclear Surety" presents an overview of surety and the subordinate topics of safety, security, and reliability.

Finally, a special note about nuclear operations doctrine. Normally, doctrine provides guidance to commanders for their consideration in campaign design as well as during the course of executing an operation and they adjust their forces to seize opportunities and respond to adversary initiatives. However, since nuclear operations have the potential to achieve effects at the strategic, operational, and tactical levels simultaneously, the conduct of nuclear operations is strictly controlled to ensure a unified effort across all instruments of national power. As such, subordinate nuclear commanders have very little flexibility in adjusting the execution of a nuclear plan. Also, detailed force planning is performed at the joint, not Service, level; hence, there is little Service doctrinal guidance herein on such normally expected topics as planning considerations at the Service component level. Some planning discussion is provided to provide general awareness; Airmen may be called upon to provide weapons system expertise, or regional expertise within a regional planning context.

FUNDAMENTALS OF NUCLEAR OPERATIONS

Last Updated: 19 May 2015

The end of the Cold War has had a major impact on the perceived utility and role of nuclear weapons in the United States. Reduced tensions between former Cold War adversaries had reduced the specter of a large-scale, Cold War-type nuclear exchange enabling force reductions; however, as long as nuclear weapons exist, the possibility of their use remains. This risk is aggravated as some state- and non-state actors seek to acquire new capabilities while others modernize and recapitalize existing nuclear systems. Thus, while the prospect of a massive nuclear exchange seems remote, the potential for a limited nuclear attack has actually grown. For this reason, nuclear weapons are as important as they have ever been.

US nuclear policy is not static and is shaped by numerous considerations. As the civilian leadership changes US policy due to new threats or technologies, the Air Force will need to develop new concepts, systems, and procedures. For instance, the concepts of “mutual assured destruction” and “flexible response” required different types of weapons, different plans, and different degrees of survivability for command and control systems. Stated policies also affect the ability to deter an enemy. As an example, US policy on using nuclear weapons to respond to an adversary’s battlefield use of weapons of mass destruction (WMD) is purposely vague. The ambiguous nature of US policy makes it impossible for an enemy to assume such a response would not be forthcoming. Even though there is no guarantee nuclear force would be used to respond to a WMD attack, planners are responsible for making alternative options available for civilian policymakers.

Physical employment of nuclear weapons should remain an option for the United States. To maintain credibility, actual employment should be a plausible consideration in certain circumstances. Without that possibility, the value of deterrence and assurance will likely be undermined.

The employment of nuclear weapons is normally considered a form of strategic attack. Strategic attack is defined as “**offensive action specifically selected to achieve national strategic objectives. These attacks seek to weaken the adversary’s ability or will to engage in conflict, and may achieve strategic objectives without necessarily having to achieve operational objectives as a precondition**.” Strategic attack is intended to accomplish national, multinational, or theater strategic-level objectives without necessarily engaging an enemy’s fielded military forces. However, this does not preclude operations to destroy the enemy’s fielded forces if required to accomplish strategic national objectives.

The employment of nuclear weapons at any level requires explicit orders from the President. The nature of nuclear weapons -- overwhelmingly more significant than conventional weapons -- is such that their use can produce political and psychological effects well beyond their actual physical effects. The employment of nuclear weapons may lead to such unintended consequences as escalation of the current conflict or long-term deterioration of relations with other countries. For this reason above all others, the decision whether or not to use nuclear weapons will always be a political decision and not a military one.

STRATEGIC EFFECTS: DETERRENCE, ASSURANCE, DISSUASION, AND DEFEAT

Last Updated: 19 May 2015

Air Force nuclear forces consist of delivery systems; nuclear command, control, and communications (NC3) capabilities; personnel; and the physical infrastructure for sustainment. Intercontinental ballistic missiles (ICBMs) and dual-capable bombers and fighters are the Air Force's delivery platforms. Combined with the Navy's submarine-launched ballistic missiles (SLBMs) and other assets, these forces form the nuclear triad. Each nuclear-capable system offers distinct advantages. SLBMs offer survivability whereas ICBMs are the most responsive, offering prompt, on-alert capability combined with dispersed fielding; also, attacks on ICBMs are unambiguous attacks against the United States. Dual-capable bomber and fighter aircraft offer mission flexibility and a capability to provide distinct signaling in a crisis through posturing to alert and through shows of force.

Deterrence, extended deterrence, assurance, dissuasion, and defeat stem from the credibility of our nuclear capabilities in the minds of those we seek to deter, assure, or dissuade. The objectives of deterring adversaries and assuring allies require visible and credible nuclear capabilities. This credibility is attained through focused day-to-day training, periodic exercises, and regular inspections which underpin the credibility of US nuclear capability.

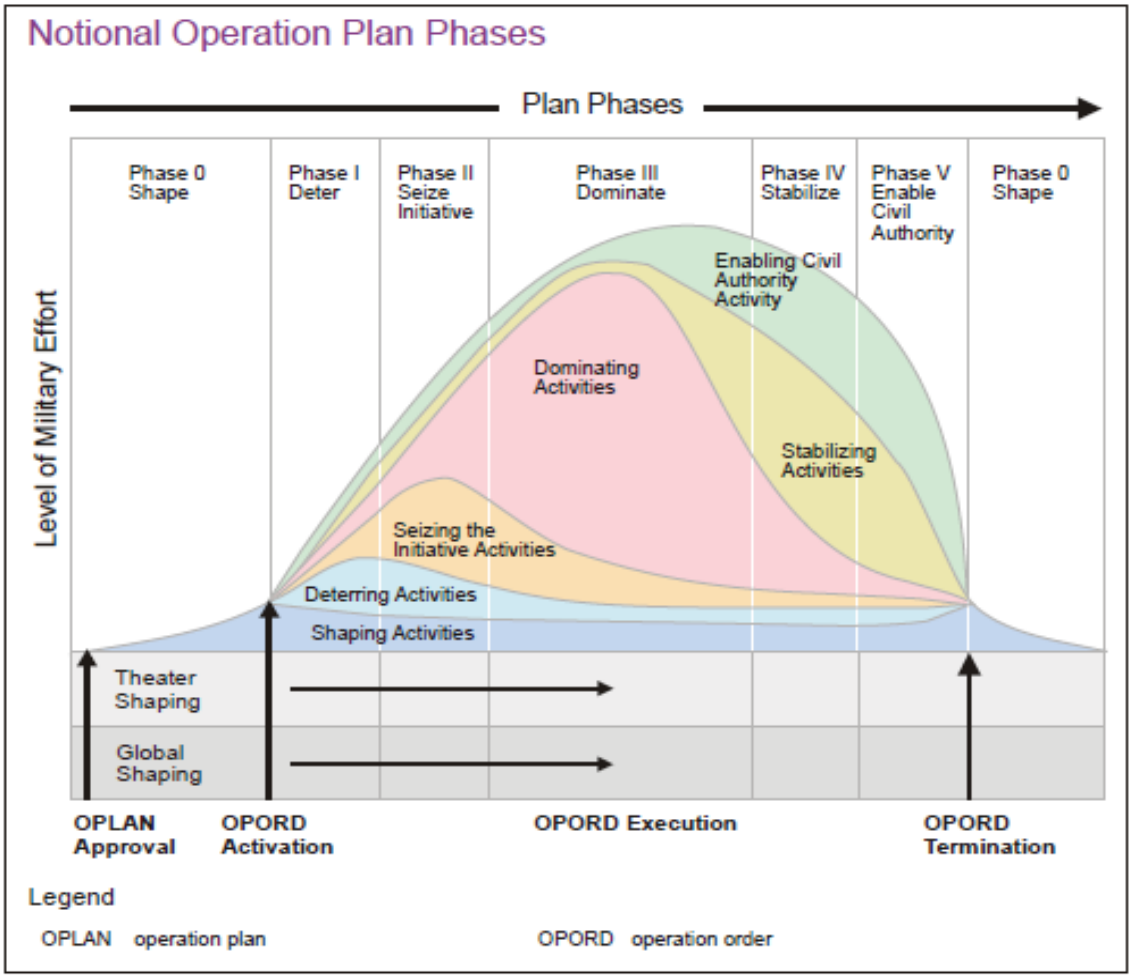
Show of Force

Show of force is defined as "**an operation designed to demonstrate US resolve that involves increased visibility of US deployed forces in an attempt to defuse a specific situation that, if allowed to continue, may be detrimental to US interests or national objectives**."

Shows of force are frequently used to deter adversaries and assure allies, frequently in the same stroke. The deployment of an additional number of bombers or fighters to a tense region is one very familiar example using Air Force capabilities. Another is the deployment of additional intelligence, surveillance, and reconnaissance assets, such as Predator remotely piloted aircraft, to signal increased US

Deterrence, assurance, and dissuasion apply across the range of military operations and during all phases of planning and execution, most normally as part of global and theater shaping (see following chart). Although deterrence activities are more typically envisioned as occurring mainly in the "shape" and "deter" phases within the joint

operational planning construct, deterrence may actually occur in any phase. Influencing an adversary's risk/benefit calculus to reduce their available options -- a form of escalation control -- can take place while other operations (including other nuclear operations) are ongoing.



Notional Planning Phases vs. Level of Military Effort **(Source: JP 5-0)**

Although joint doctrine nominally labels deterrence as a Phase 1 activity within the plan phasing construct, deterring adversaries (especially in weapon of mass destruction-related actions) and assuring allies continues even after escalation has increased to the point of nuclear or conventional weapons employment. The objective of stability does not cease once other military operations begin. Indeed, deterrence can occur before, during, or after military operations.

For additional discussion on deterrence, assurance, and dissuasion, see also "Practical Design: The Coercion Continuum" in Annex 3-0, *Operations and Planning*.

DETERRENCE

Last Updated: 19 May 2015

Deterrence is defined as "**the prevention of action by the existence of a credible threat of unacceptable counteraction and/or belief that the cost of action outweighs the perceived benefits**." Deterrence is critical to US national security efforts. Both nuclear and conventional operations contribute to the effect. Although nuclear forces are not the only factor in the deterrence equation, our nuclear capability underpins all other elements of deterrence.

> The first Gulf War also offers evidence of the value of nuclear deterrence. It appears that the US nuclear deterrence strategy was key to deterring the Iraqi use of WMD in the war. In August 1995, the former Iraqi foreign minister, Tariq Aziz, said that Iraq was deterred from using its WMD because the Iraqi leadership had interpreted Washington's threats of grievous retaliation as meaning nuclear retaliation.
>
> In January 1996, former head of Iraqi military intelligence Gen Wafic al Sammarai said: "Some of the Scud missiles were loaded with chemical warheads, but they were not used . . . the warning was quite severe, and quite effective. The allied troops were certain to use nuclear arms, and the price will be too dear and too high."
>
> -- Keith B. Payne, *"Maintaining Flexible and Resilient Capabilities for Nuclear Deterrence,"* Strategic Studies Quarterly, Summer 2011

Deterrence requires US nuclear operations to be visible to the target audience. To have credibility, an adversary must believe that the Air Force has the capability to act quickly, decisively and successfully. The cumulative effects of deterrence and assurance stem from the credibility of nuclear capabilities in the minds of those we seek to deter, assure, or dissuade. This credibility is attained through activities such as day-to-day training, periodic exercises, and regular inspections which demonstrate Air Force nuclear force capability and readiness.

Global Thunder and Global Lightning, annual command-level exercises sponsored by US Strategic Command (USSTRATCOM) in cooperation with Air Force Global Strike Command and the North American Aerospace Defense Command, are key demonstrations of the Air Force's ability to test and validate nuclear command and control and execution procedures. Exercise objectives typically include live communications and the participation of units assigned or attached to USSTRATCOM during wartime, including USSTRATCOM's airborne command post and external participation from national-level organizations and other combatant commands.

Nuclear delivery system testing and treaty inspections are distinct messaging opportunities. Both are highly visible examples of strategic messaging. Successful capability testing and treaty inspections provide the world evidence of the credibility of the US' safe, secure, and effective nuclear deterrent.

Nuclear operations can also be used to deter conventional threats. Nuclear operations in the 21st century may be tied to more complex situations, combining both conventional and nuclear operations. Today's Air Force recognizes that many adversaries are willing to employ nuclear operations under many different circumstances.

The notion of countries escalating conflict to avoid conventional defeat may sound far-fetched, but it is well grounded in history. When nuclear-armed states face overwhelming conventional threats -- or worry about the possibility of catastrophic conventional defeat -- they often adopt coercive escalatory doctrines to deter war or stalemate a conflict that erupts. Pakistan openly intends to use nuclear weapons to counter an overwhelming conventional Indian invasion. Russia claims it needs theater nuclear weapons to counter NATO's conventional advantages. Israel expects to win its conventional wars but retains the capability for nuclear escalation to prevent conquest in case its conventional forces suffer a catastrophic defeat.

The discussion of coercive nuclear escalation should sound familiar to Western analysts, as it was NATO's strategy for three decades. From the mid-1960s until the end of the Cold War, NATO planned to deter war, and stalemate it if necessary, through coercive nuclear escalation. NATO understood that -- by the mid-1960s -- it could no longer win a nuclear war against the Soviet Union, but it still based its national security strategy on coercive escalation because it believed Warsaw Pact conventional forces were overwhelming.

-- Keir A. Lieber, "*The New Era of Nuclear Weapons, Deterrence, and Conflict*," Strategic Studies Quarterly, Spring 2013.

For additional discussion on effects, see "Practical Design: The Coercion Continuum" in Annex 3-0, *Operations and Planning*.

EXTENDED DETERRENCE

Last Updated: 19 May 2015

Historically, the United States provides for the security of its allies by threatening a nuclear response in the event of an enemy attack. This threat of retaliation serves as the foundation for what is defined as extended deterrence.

> Extended deterrence involves defense guarantees by a state to its allies, usually -- but not exclusively -- in the form of formal military alliances, the purpose of which is to deter a common opponent from undertaking military moves that might affect the political and military interests of the allies. Extended deterrence thus depends on the sharing of important security interests, as well as coordination, between the guarantor and the ally. In order to succeed, it also requires sufficient political will from both sides to enter into, and maintain, this security relationship.
>
> -- Yair Evron, "*Extended Deterrence in the Middle East*," Nonproliferation Review, November 2012

Extended deterrence is sometimes described as providing a nuclear umbrella over allies and partners. The United States pledges use of its own nuclear arsenal to allies in order to provide for their security and serves as a nonproliferation tool by obviating the need for allies and partners to develop or acquire and field their own nuclear arsenals.

In the case of the North Atlantic Treaty Organization (NATO), the continued deployment of US nuclear weapons in Europe is a strategic alliance issue. This on-going forward

> One of the main lessons of US commitments in both NATO and East Asia has been that constant consultations and the creation of forums for such consultations and common planning contributes to both deterrence and assurance.
>
> There are, however, significant differences between the United States' European and East Asian commitments. NATO is an alliance comprising many states in which there is an overall unifying commitment, with the United States providing the main (nuclear) security assurance. US ground and air units are deployed in some states. In addition to the US-based arsenal of strategic nuclear weapons, non-strategic nuclear weapons are deployed in several European states. In East Asia, US commitments are structured very differently. There are separate bilateral defense agreements with different states, including Japan, Australia, South Korea, and, less explicitly, Taiwan.
>
> -- Yair Evron, "*Extended Deterrence in the Middle East*," Nonproliferation Review, November 2012

basing of US nuclear capabilities not only extends deterrence of adversaries on behalf of European allies, but also assures NATO partners that the Air Force is capable of helping ensure their collective national security.

According to the NATO Deterrence and Defense Posture Review, "Nuclear weapons are a core component of NATO's overall capabilities for deterrence and defense alongside conventional and missile defense forces. As long as nuclear weapons exist, NATO will remain a nuclear alliance. Allies agree … to develop concepts for how to ensure broadest possible participation of Allies concerned in their nuclear sharing arrangements." For the United States' Pacific partners, the Air Force provides a nuclear umbrella over Japan and South Korea, as well as Australia and New Zealand.

> South Korea said a B-52 bomber will fly over the Korean peninsula today for the second time this month as part of the U.S. effort to send a signal to North Korea after it threatened preemptive nuclear strikes.
>
> "Just having the B-52 near the Korean peninsula and pass through means that the U.S. nuclear umbrella can be provided whenever necessary," South Korean Defense Ministry spokesman Kim Min Seok told reporters in Seoul, declining to disclose today's flight time. The bombers carry air-to-ground missiles with a range of up to 3,000 kilometers (1,864 miles) and "are believed to deliver nuclear warheads," he said.
>
> The first B-52 flight came on March 8 as part of joint U.S.-South Korea military drills, Defense Department spokesman George Little said yesterday in a statement, adding such flights "are routine." Deputy defense secretary Ashton Carter in Seoul yesterday reaffirmed the U.S. commitment to deter North Korea independent of its multi-billion dollar defense budget cuts. …….
>
> "We are drawing attention to the fact we have extended deterrence capabilities that we believe are important to demonstrate in the wake of recent North Korean rhetoric," Little said yesterday in a statement.
>
> -- "U.S. Flies B-52s Over Korea in Show of Power Against North," Bloomberg News Report, 19 March 2013

Extended deterrence and assurance of allies are two sides of the same coin. Shows of force, which are "operations designed to demonstrate US resolve that involves increased visibility of US deployed forces in an attempt to defuse a specific situation that, if allowed to continue, may be detrimental to US interests or national objectives," shape both allied and adversary beliefs.

> "It takes only five per cent credibility of American retaliation to deter the Russians, but ninety-five per cent credibility to reassure the Europeans."
>
> -- Denis Healey, *The Time of My Life* (London: Norton, 1989), p. 243.

For additional discussion on effects, see "Practical Design: The Coercion Continuum" in Annex 3-0, *Operations and Planning*.

ASSURANCE

Last Updated: 19 May 2015

Complementing extended deterrence, where the objective is to influence the decision-making of an adversary, assurance involves the easing of the fears and sensitivities of allies and partners.

US assurance of allies and partners has been conveyed through various alliances, treaties, and bilateral and multilateral agreements. For example:

- The *Treaty of Mutual Cooperation and Security Between the US and Japan* specifies a commitment to defense cooperation, regular consultations, and peace and security in the Far East
- The *Mutual Defense Treaty Between the United States and the Republic of Korea* declares the countries' shared determination to defend themselves and preserve peace and security in the Pacific area
- The *North Atlantic Treaty* reaffirms the goal of promoting stability, uniting efforts for collective defense, and for the preservation of peace and security among NATO partners

A key Air Force contribution to assurance is through shows of force:

> "The United States flew two Stealth bomber practice runs over South Korea on Thursday, in a second show of force to North Korea after a B52 bomber made a similar run earlier this week amid rising tensions on the Korean peninsula.
>
> The flights came after North Korea said it would attack American bases in the Pacific following a U.S.-led drive to impose sanctions on North Korea for its third nuclear weapons test. …..
>
> "This mission by two B-2 Spirit bombers assigned to 509th Bomb Wing...demonstrates the United States' ability to conduct long-range, precision strikes quickly and at will," the United States Forces in Korea said in a statement.
>
> -- "*U.S. flies Stealth bombers over South Korea in warning to North*," Reuters, 28 March 2013

If proliferation increases, it can be expected that allies and partners will demand tangible assurance from the US. This, in turn, will continue to drive demands on the force structure and capability requirements.

For additional discussion on effects, see "Practical Design: The Coercion Continuum" in Annex 3-0, *Operations and Planning*.

DISSUASION

Last Updated: 19 May 2015

Dissuasion, also closely related to deterrence, consists of actions taken to demonstrate to an adversary that a particular course of action is too costly, or that the benefits are too meager. The intent is thus to dissuade potential adversaries from embarking on programs or activities that could threaten our vital interests, such as developing or acquiring nuclear capabilities. Dissuasion differs from deterrence in that it is a concept aimed at precluding the adversary from developing or acquiring nuclear capabilities. Dissuasion is most often conducted using instruments of national power in concert, such as a combination of diplomatic, economic, and military measures. Air Force nuclear forces may play an important role in the latter, often by providing a credible deterrent.

An unanticipated outcome from Operation IRAQI FREEDOM in 2003 was Libya's subsequent decision to divest itself of all weapons of mass destruction (WMDs), including its investment in nuclear weapons technology.

Although a desire to normalize relationships with the West was also a factor in Libya's decision, the key rationale behind Operation IRAQI FREEDOM was to rid Iraq of its WMDs. This fact, coupled with the rapid, forceful take-down of Iraq in general, was not lost on Libyan leadership.

For additional discussion on effects, see "Practical Design: The Coercion Continuum" in Annex 3-0, *Operations and Planning*.

DEFEAT

Last Updated: 19 May 2015

To convince an adversary to surrender or to end a war on terms favorable to the United States, the President may authorize defeat of an enemy using nuclear weapons. Defeat is an objective (and thus technically an effect) that may be achieved using nuclear weapons, by themselves or in conjunction with other forces, should the decisive and culminating nature of their effects be required to resolve a conflict. Operations seeking outright defeat of an enemy using nuclear weapons will likely use other effects of nuclear operations (any or all of the other nuclear operations effects) simultaneously to influence the decision making process of all parties involved.

Defeat may entail prevailing over the enemy's armed forces, destroying their war-making capacity, seizing territory, thwarting their strategies, or other measures in order to force a change in the enemy's behavior, policies, or government. Escalation control is a major consideration for this effect. Escalation control entails the ability to increase the enemy's cost of defiance, while denying them the opportunity to neutralize those costs. In addition, the high level of commitment required for the use of nuclear weapons by the United States is a tangible demonstration of our resolve and likely to affect our ability to defeat the will of an enemy.

Nuclear weapons have been used in combat only twice, of course: at Hiroshima and Nagasaki, culminating World War II in the Pacific:

> The atomic bombings considerably speeded up [the] political maneuvering within the [Japanese] government. This in itself was partly a morale effect, since there is ample evidence that members of the Cabinet were worried by the prospect of further atomic bombings, especially on the remains of Tokyo. The bombs did not convince the military that defense of the home islands was impossible…. It did permit the Government to say, however, that no army without the weapon could possibly resist an enemy who had it, thus saving "face" for the Army leaders and not reflecting on the competence of Japanese industrialists or the valor of the Japanese soldier. In the Supreme War Guidance Council voting remained divided, with the War Minister and the two Chiefs of Staff unwilling to accept unconditional surrender. There seems little doubt, however, that the bombing of Hiroshima and Nagasaki weakened their inclination to oppose the peace group.
>
> A quip was current in high government circles at this time that the atomic bomb was the real Kamakaze, since it saved Japan from further useless slaughter and destruction.
>
> -- U.S. Strategic Bombing Survey, *The Effects of the Atomic Bombings of Hiroshima and Nagasaki*, 19 June 1946

For additional discussion on effects, see "Practical Design: The Coercion Continuum" in Annex 3-0, *Operations and Planning*.

PRESENTATION OF NUCLEAR FORCES

Last Updated: 19 May 2015

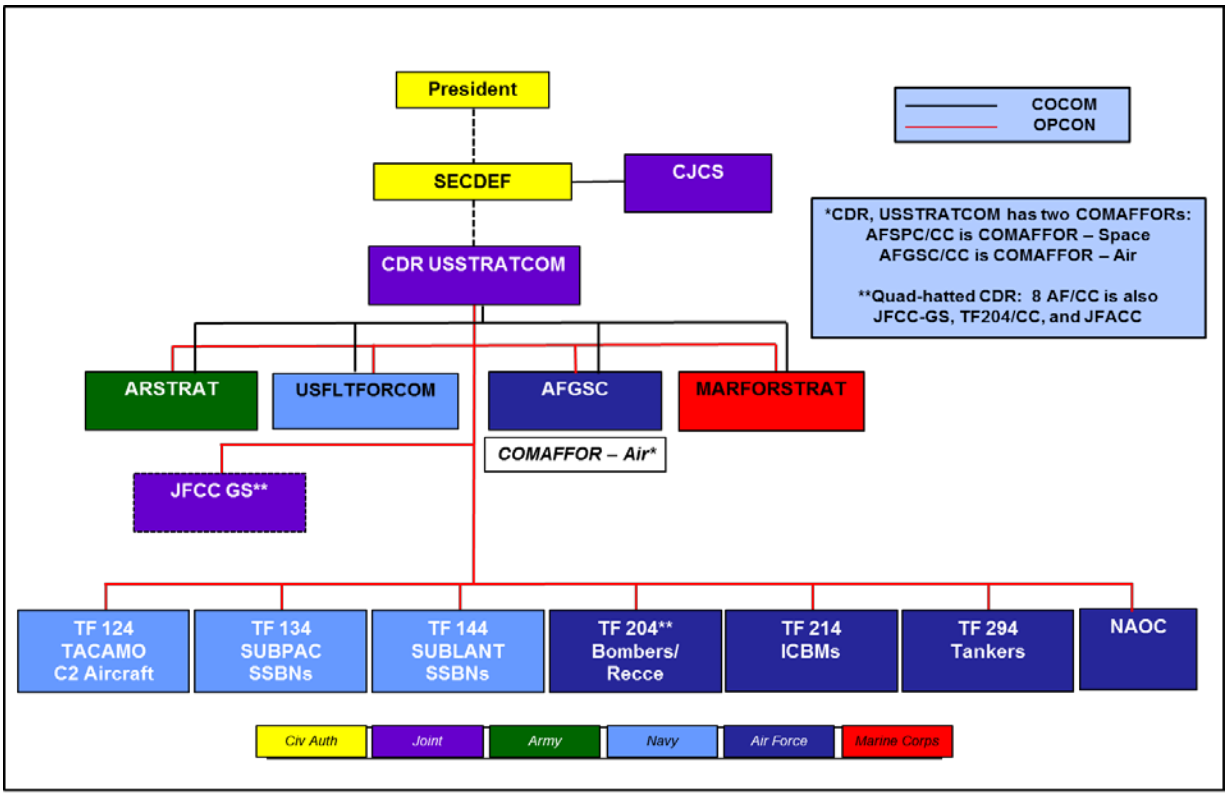
The command structure established by Commander, US Strategic Command (USSTRATCOM), (CDRUSSTRATCOM) is different than other combatant command (CCMD) structures due to its range of assigned missions and the number and range of supporting commands and agencies from which it draws forces and capabilities. Within USSTRATCOM are a number of joint functional component commands (JFCCs) in lieu of standing joint task forces (JTFs). The roles and responsibilities of the JFCCs vary, as well as the command relationships of the supporting Service components. As a result of this organization, care must be taken to understand the various command arrangements, disposition of command authorities, and roles of subordinate commanders. It is important to keep track of joint and Service command lines, especially since these frequently converge on dual- or multi-hatted commanders.

The following discussion will deal only with organization for USSTRATCOM's nuclear operations mission.

USSTRATCOM Organization for Nuclear Operations

Nuclear forces within USSTRATCOM, when generated, are organized as single-Service functional task forces. See following figure, *USSTRATCOM Organization for Nuclear Operations*. Task Force 204 includes nuclear-capable bombers and airborne reconnaissance; Task Force 214 consists of ICBMs; and Task Force 294 includes air refueling aircraft and airlift support. Comparable task forces exist for the Navy's ballistic missile submarines (Task Forces 134 and 144) and for airborne communications (Task Force 124). Each task force may have its own commander.

It is important to note that the task force commanders are not joint commanders within the normal constellation of joint force commanders as described in joint doctrine. However, they do exercise tactical control (TACON) over their forces as delegated by CDRUSSTRATCOM through operations orders (OPORDs).



USSTRATCOM Organization for Nuclear Operations

Between the operating task forces and CDRUSSTRATCOM are two intermediate command entities of interest to Air Force doctrine:

- JFCC-Global Strike (JFCC-GS). JFCC-GS is responsible for planning and integration for nuclear and conventional long-range strike in support of USSTRATCOM. Commander, JFCC-GS exercises no formal command authorities.
- Commander, Air Force Forces-Air (COMAFFOR-Air). COMAFFOR-Air is the Air Force Service component commander to USSTRATCOM for nuclear and global strike operations. COMAFFOR-Air exercises operational control (OPCON) of assigned and attached Air Force forces as delegated by CDRUSSTRATCOM. Note, however, that for nuclear operations, CDRUSSTRATCOM retains OPCON of nuclear forces at all times and exercises control through the task force commanders. Thus, for nuclear operations, COMAFFOR-Air is simply a force provider.

The delegation of command authorities is codified in two separate USSTRATCOM OPORDs which are revised annually.

Air Force Organization for Nuclear Operations

Air Force Global Strike Command (AFGSC), an Air Force major command, is the Air Force Service component to USSTRATCOM for nuclear and global strike operations. As such, Commander, AFGSC, (AFGSC/CC) is COMAFFOR-Air. Through the Service component hat, AFGSC/CC exercises administrative control (ADCON) of assigned and attached Air Force Forces, and through the joint hat (COMAFFOR-Air) exercises

OPCON, as delegated by CDRUSSTRATCOM, over subordinate assigned and attached Air Force forces. See following figure, *Air Force Organization for Nuclear Operations*.

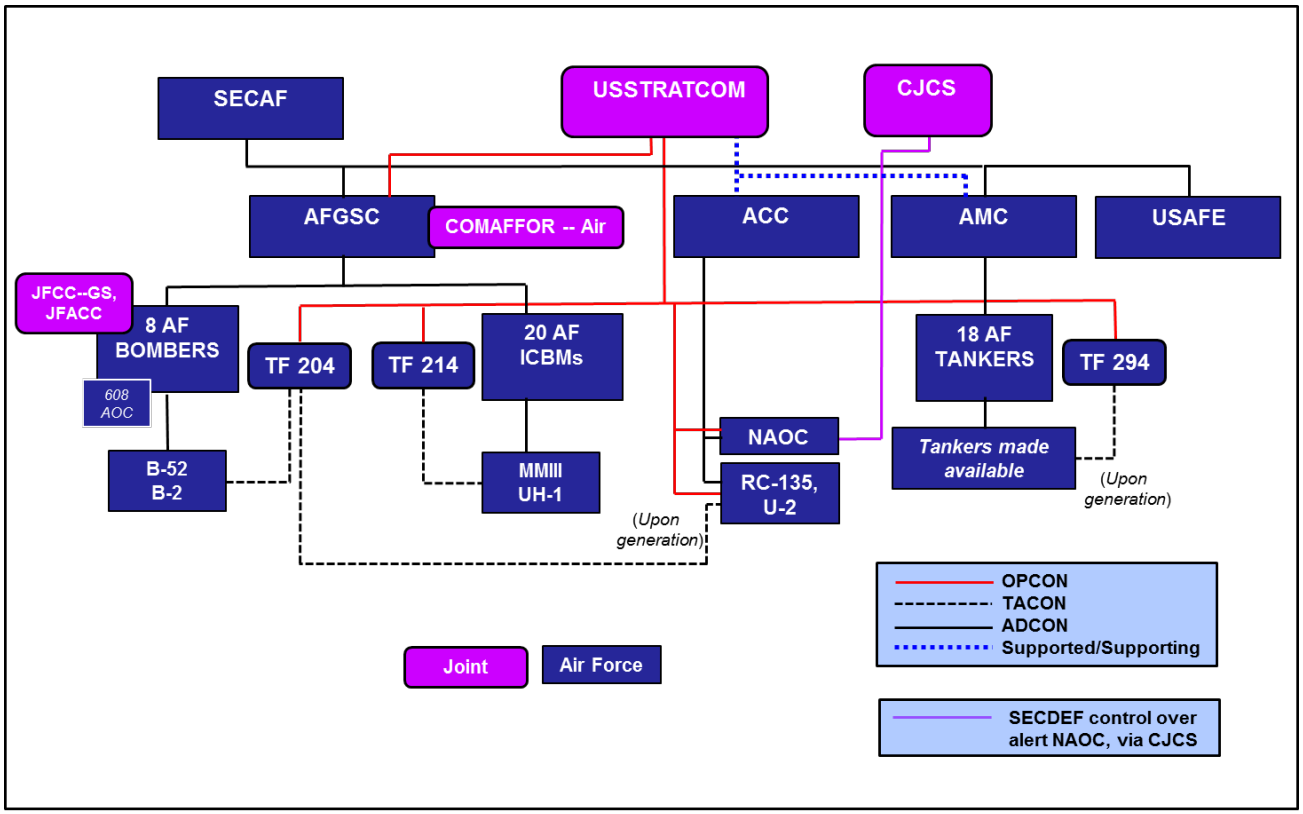
Subordinate to AFGSC are two numbered Air Forces (NAFs), Eighth Air Force (8 AF) and Twentieth Air Force (20 AF). The NAF commanders exercise ADCON over their respective forces. The NAF commanders are also dual-hatted as Commanders, Task Force 204 and Task Force 214 respectively; through these hats they exercise TACON as delegated by CDRUSSTRATCOM. Commander, 8 AF, is further multi-hatted as Commander, JFCC-GS, and as joint force air component commander (JFACC) to CDRUSSTRATCOM. As JFACC, 8 AF/CC provides daily monitoring of those joint forces made available, command and control in peacetime, and during non-nuclear global strike operations to accomplish tasked missions.

Within the NAFs, forces are arrayed internally into wings, groups, and squadrons as necessary to provide internal span of control. Unlike the normal Air Force doctrine organizational model, there is no single air expeditionary task force for nuclear operations.

Air Mobility Command provides air refueling and airlift support in direct support of USSTRATCOM. When generated, they form up under Eighteenth Air Force (18 AF), and Commander, 18 AF, is dual-hatted as Commander, TF 294, who exercises joint and Service authorities as specified by Commander, AMC and by CDRUSSTRATCOM.

Air Combat Command provides the National Airborne Command Post (NAOC) aircraft (E-4B) and reconnaissance aircraft (RC-135s and U-2s). Commander, ACC, exercises ADCON over these forces. When the reconnaissance aircraft are generated, they are attached to TF 204 and Commander, TF 204, then exercises TACON of them. The Chairman, Joint Chiefs of Staff exercises control over the alert NAOC.

Finally, Commander, US Air Forces Europe, organizes, trains, and equips dual-capable fighters and associated forces for the North Atlantic Treaty organization nuclear mission.



Air Force Organization for Nuclear Operations

NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS

Last Updated: 19 May 2015

The nuclear command, control, and communications (NC3) system refers to the "collection of activities, processes, and procedures performed by appropriate commanders and support personnel who, through the chain of command, allow for decisions to be made based on relevant information, and allow those decisions to be communicated to forces for execution" (AFI 13-550, *Air Force Nuclear Command, Control, and Communications* [NC3]).

Successful NC3 in all environments, including denied access and stressed operating areas, is an essential element to stabilizing a crisis, deterring attack, and maintaining the safety, security, and effectiveness of nuclear operations. The ability to command, control, and communicate with nuclear forces across all phases of conflict is a foundational capability of the Air Force and undergirds US national defense policy.

Specifically, resilient and effective NC3 ensures that civilian authorities have the maximum possible decision time in all scenarios, which strengthens strategic stability particularly at lower force levels; strengthens the Air Force's ability to employ forces against a target or series of targets in a timely manner; provides civilian authorities the means to terminate a conflict and, thus, avoid further escalation; and strengthens the Air Force's ability to respond even after suffering an attack or series of attacks.

Survivable and enduring command and control (C2) capabilities disseminate warning information and nuclear control orders and add significant resilience to the NC3 system of systems. Resilient NC3 contributes to stability by convincing adversaries that they cannot execute an attack against the United States or its allies without suffering consequences of a nuclear response. C2 of nuclear operations is provided through a survivable line of communication and warning systems to ensure dedicated connectivity among the President and nuclear forces.

NUCLEAR COMMAND AND CONTROL SYSTEM

The President's ability to exercise nuclear authority is through the Nuclear Command and Control System (NCCS).

> "The NCCS supports the Presidential nuclear C2 of the combatant commands in the areas of integrated tactical warning and attack assessment, decision making, decision dissemination, and force management and report back. To accomplish this, the NCCS comprises those critical communications system components of the

> DOD information networks that provide connectivity from the President and Secretary of Defense through the National Military Command System to the nuclear combatant commanders and nuclear execution forces. It includes the emergency action message dissemination systems and those systems used for tactical warning/attack assessment, conferencing, force report back, reconnaissance, retargeting, force management, and requests for permission to use nuclear weapons. The NCCS is integral to and ensures performance of critical strategic functions of the Global Command and Control System. The Minimum Essential Emergency Communications Network provides assured communications connectivity between the President and the strategic deterrent forces in stressed environments." (Joint Publication 1, "*Doctrine for the Armed Forces of the United States*")

Because only the President of the United States can authorize the employment of US nuclear weapons, nuclear operations require NC3 systems to provide national leaders with situational awareness, advance warning, and command and control capabilities. Deterrence, stability, and escalation control require that these capabilities endure nuclear attack so that no adversary can contemplate a disarming first strike.

POSITIVE CONTROL

The President may direct the use of nuclear weapons through an execute order via the Chairman of the Joint Chiefs of Staff to the combatant commanders and, ultimately, to the forces in the field exercising direct control of the weapons.

To allow for the timely execution of these orders, emergency action procedures allow for a timely response to an execution message and ensure an execution order is valid and authentic. Air Force personnel involved in the actual employment of nuclear weapons are intensively and continuously trained and certified in these procedures so they can quickly and accurately respond to the order.

POSITIVE RELEASE ORDERS

To prevent unauthorized employment of nuclear weapons, cryptologic systems are used to validate the authenticity of nuclear orders. Access to these systems and codes are tightly controlled to ensure unauthorized individuals are not permitted to gain access to the means to order or terminate nuclear weapons employment. Conversely, once appropriate orders have been sent, weapon system operators must respond in a timely manner using standard procedures. Knowledge of these procedures could allow an adversary to determine the time required to conduct operations and the methods crew members will use to accomplish them, allowing that adversary to take more effective measures to counter or limit a nuclear strike.

As with all components of force protection, information security and operations security are critical to mission success.

PLANNING CONSIDERATIONS

Last Updated: 19 May 2015

US Strategic Command (USSTRATCOM) is tasked by the Joint Strategic Capabilities Plan to provide specific support to geographic combatant commanders (CCDRs) for their nuclear planning. Planning for nuclear operations differs in one important aspect from other forms of operations planning: USSTRATCOM performs detailed planning down to the individual sortie level, and as a result there is no separate supporting Service component operation plan. (Note: While Airmen should understand planning considerations, the following discussion does not imply this is an Air Force component task. Also note that most of the specific details regarding nuclear planning are classified.)

Nuclear operations can either be preplanned against specific targets or adaptively planned against emerging targets. Preplanning provides the opportunity to conduct detailed planning and analysis against targets without the time pressures normally associated with a crisis action scenario. Preplanned options maintain centralized control while minimizing response time. Plans provide a variety of targeting options, which allow national leadership the flexibility to achieve objectives. As circumstances change during a conflict, adaptive planning allows leadership to retarget and strike emerging, mobile, or previously unknown targets.

Planning for theater nuclear operations should be integrated into the supported CCDR's plans. This will maximize the desired effects, identify and prioritize intelligence, planning, and force requirements, and ensure proper levels of coordination and support necessary for successful mission operations. Liaison teams are assigned to work with the joint force commander and components in the development of nuclear options; Airmen within geographic commands may collaborate on matters of weapon system capabilities and regional issues.

Planners may integrate nuclear options with conventional or non-kinetic operations to enhance effectiveness and minimize collateral effects. In some scenarios, the delivery of a single or a few nuclear weapons may require conventional support in the form of air superiority, suppression of enemy air defenses, air refueling, and post-strike assessment. In other scenarios, theater nuclear weapons may be integrated within a larger strike that also includes delivery of conventional ordnance. In yet other scenarios, continental US-based bombers or submarine-launched cruise or ballistic missiles may support theater operations. All scenarios require careful planning to ensure integration of all capabilities, beyond simple deconfliction of weapons effects.

Nuclear employment is closely coordinated to combine targeting, mutual support, and defense, as well as national strategies and objectives. The options contained therein provide sufficient detail to ensure mutual support and defense suppression. Of particular concern is the timing and deconfliction of weapons. Fratricide, a term of art in nuclear force planning used to denote the destruction of one weapon by another, will reduce the effectiveness of the nuclear strike. Planners coordinate between different weapons to ensure they do not conflict. Air Force planners and USSTRATCOM liaison teams in a theater of operations must also ensure that weapons are deconflicted before being employed.

The significant destructive power and other related effects from nuclear weapons demands that Air Force planners take special precautions. Plans should address possible adversary nuclear employment scenarios. Every conceivable situation needs to be considered such as electromagnetic pulse and dispersal of forces versus mass formation. Planners should place a premium on intelligence to understand an adversary's strategy involving use of nuclear weapons, especially whether there is a declared "first use" strategy and when it is most likely for nuclear weapon employment to occur. Perhaps the most difficult task for planners is to devise a plan for escalation control. Understanding adversary interpretation of US actions and similarly grasping adversary messaging is crucial to managing escalation control.

Planning efforts should also be reviewed to ensure that friendly force commanders do not make the mistake of mirror imaging. Applying US values and culture to planning assumptions may lead commanders to wrongly believe that an adversary would be unwilling to use nuclear weapons during the course of an engagement-even if US or allied actions are non-nuclear. Additionally, escalation control relies heavily on each side of a conflict understanding the intent of the other. For example, what one commander believes is implemented as an operational example showing restraint, may actually be received as an escalatory action by the adversary. Rational behavior must be determined through the lens of cultural and historical context to properly predict an adversary's response to US nuclear operations.

POST-STRIKE ENVIRONMENT

Commanders and planners should consider that the operating environment after a nuclear exchange can be equally inhospitable for friendly forces. Movement through an area that has experienced a nuclear detonation may be slow because significant protective measures are required. Plans for post-attack recovery and reconstitution should not only include assessment of the success of US strikes, but also assessment of adversary strikes against US military and civilian facilities.

US nuclear systems and facilities both in the homeland and overseas are lucrative targets. Air Force forces should be capable of responding to and executing operations in a contaminated environment with minimal degradation of force effectiveness. Implementing the principles of chemical, biological, radiological and nuclear (CBRN) defense—avoidance, protection, and decontamination—will help preserve the fighting capability of forces. Annex 3-40, *Counter Weapons of Mass Destruction (WMD)*

Operations, Joint Publication (JP) 3-11, *Operations in Chemical, Biological, Radiological, and Nuclear (CBRN) Environments*, and JP 3-41, *Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives Consequence Management*, provide additional guidance.

NUCLEAR SURETY

Last Updated: 19 May 2015

The Air Force implements a stringent nuclear surety program to assure nuclear weapons and their components do not become vulnerable to loss, theft, sabotage, damage, or unauthorized use. All individuals involved with nuclear weapons and nuclear weapon components are responsible for the safety and security of those devices at all times.

NUCLEAR SURETY

"The goal of the Air Force Nuclear Weapons Surety Program is to incorporate maximum nuclear surety, consistent with operational requirements, from weapon system development to dismantlement." (AFI 91-101, *Air Force Nuclear Weapons Surety Program*). This program applies to materiel, personnel, and procedures that contribute to the safety, security, and control of nuclear weapons, thus assuring no nuclear accidents, incidents, loss, or unauthorized or accidental use. The Air Force continues to pursue safer, more secure, and more reliable nuclear weapons consistent with operational requirements.

Adversaries and allies should be highly confident of the Air Force's ability to secure nuclear weapons from accidents, theft, loss, and accidental or unauthorized use. This day-to-day commitment to precise and reliable nuclear operations is the cornerstone to the credibility of deterrence.

Per Department of Defense (DOD) Directive 3150.02, *DOD Nuclear Weapons Surety Program*, "[f]our DoD nuclear weapon system surety standards provide positive measures to:

- Prevent nuclear weapons involved in accidents or incidents, or jettisoned weapons, from producing a nuclear yield.
- Prevent **deliberate** prearming, arming, launching, or releasing of nuclear weapons, except upon execution of emergency war orders or when directed by competent authority.
- Prevent **inadvertent** prearming, arming, launching, or releasing of nuclear weapons in all normal and credible abnormal environments.
- Ensure adequate security of nuclear weapons." [bold in original]

Whether working with continental US (CONUS)-based nuclear forces or conducting theater nuclear operations, commanders must ensure the safety, security, and reliability of their weapons and associated components. While the appropriate infrastructure already exists at CONUS bases with nuclear forces, geographic combatant commanders should consider the additional needs incurred if they are going to have nuclear weapons deployed into their area of responsibility.

Nuclear surety is the capstone construct that contains nuclear safety, security, and reliability programs, each of which is summarized below.

SAFETY

All individuals involved with nuclear weapons are responsible for the safety of those devices. Because of the destructive potential of these weapons, and the possibility that their unauthorized or accidental use might lead to war, safety is paramount.

The four previously mentioned standards include inherent warhead design features that prevent accidental or unauthorized nuclear yields, delivery platform design features, and operational procedures that prevent accidental or unauthorized use. The positive measures may take the form of mechanical systems, such as permissive action links that do not allow the arming or firing of a weapon until an authorized code has been entered. They may also involve personnel monitoring systems, such as the Personnel Reliability Program (PRP), the Arming and Use of Force (AUoF) by Air Force Personnel, or the Two-Person Concept. Commanders are responsible for ensuring that appropriate systems are in place, as described by appropriate Air Force policies. To track the implementation of these positive measures, the Air Force certifies its nuclear weapons systems. The Air Force's Nuclear Certification Program includes safety design, weapon compatibility, personnel reliability, technical guidance, specific job qualifications, inspections, and Weapons System Safety Rules (WSSR). Refer to AFI 63-125, *Nuclear Certification Program*, AFI 91-101, *Air Force Nuclear Weapons Surety Program*, and AFI 31-117, *Arming and Use of Force by Air Force Personnel*, for more specific guidance.

Weapon System Safety Rules

Weapon system safety rules (WSSR) ensure that nuclear weapons are not detonated, intentionally or otherwise, unless authorized. Safety rules apply even in wartime. While commanders may deviate from a specific rule in an emergency, they may not expend a nuclear weapon until an authentic execution order has been received. This has led to the so-called "usability paradox." Nuclear weapons must be "usable enough" so an enemy is convinced they may be rapidly employed in the event of an attack. They must not be so "usable," however, as to allow for the unauthorized use due to individual action or mechanical error.

WSSR are implemented through a combination of mechanical means, security procedures, flying rules, and personnel programs. Different weapon systems will have

different rules based on their capabilities. Storage and movement of weapons must also be consistent with WSSR. Commanders and operators must follow applicable Air Force policies for their weapon system and must ensure that non-US personnel adhere to applicable Air Force and multinational requirements. One key component of WSSR is that, while preventing the unauthorized use of nuclear weapons, they allow for timely employment when ordered. To this end, all personnel involved in the command, control, and support of nuclear weapons must be familiar with WSSR for their system.

SECURITY

Nuclear weapons and their components must not be allowed to become vulnerable to loss, theft, sabotage, damage, or unauthorized use. Nuclear units must ensure measures are in place to provide the greatest possible deterrent against hostile acts. Should this fail, security should ensure detection, interception, and defeat of the hostile force before it is able to seize, damage, or destroy a nuclear weapon, delivery system, or critical components.

Commanders are accountable for the safety, training, security, and maintenance of nuclear weapons and delivery systems, and reliability of personnel at all times. Whether on a logistics movement or during an airlift mission, commanders should limit the exposure of nuclear weapons outside dedicated protection facilities consistent with operational requirements. Commanders must ensure that nuclear weapons and nuclear delivery systems are maintained according to approved procedures. Commanders are responsible for considering the additional needs incurred if nuclear capabilities are deployed into their operational area.

A security infrastructure exists at bases that routinely handle nuclear weapons. However, weapons and their delivery systems may be moved to other bases to enhance survivability or may be deployed into a theater. Commanders at such locations must ensure appropriate storage facilities are established and proper security measures are in place. The storage of nuclear weapons on a base not only requires a secure location and additional security personnel, but also impacts other areas such as driving routes, local flying area restrictions, aircraft parking areas, the use of host-nation or contract personnel, and other aspects of day-to-day operations. Note, too, that weapons are most vulnerable in transit or when deployed for use, so special care must be taken at those times. Commanders and, in fact, all Airmen have a responsibility for force protection, and the security of nuclear weapons is a key component of that concept. Air Force policies which outline security requirements must be understood by all affected personnel.

Airmen should neither confirm nor deny the presence or absence of nuclear weapons at any general or specific location. This US policy applies even if a particular location may reasonably be assumed to contain nuclear weapons, such as a missile launch facility or a bomber base. The goal of this policy is “to deny militarily useful information to potential or actual enemies, to enhance the effectiveness of nuclear deterrence, and contribute to the security of nuclear weapons, especially against the threats of sabotage

and terrorism." (DOD Directive 5230.16, *Nuclear Accident and Incident Public Affairs (PA) Guidance*)

RELIABILITY

The Air Force employs positive measures to ensure the reliability of its nuclear weapons systems and personnel to accomplish the mission. Reliability is also a product of the system's safety features, including safety design, weapon compatibility, personnel reliability, technical guidance, specific job qualifications, and nuclear technical inspections. Independent inspections and staff assistance visits are also an integral part of maintaining nuclear surety.

Weapon System Reliability

Through sustainment, testing, and modernization, the Air Force ensures the reliability of nuclear weapon systems. The Air Force engages the Department of Energy's National Nuclear Security Administration and other government agencies to ensure nuclear warheads and related interfaces continue to meet Air Force warfighting requirements. The Air Force continues to provide essential leadership of interagency reliability groups to include test planning, interface requirements and performance, and warhead design reviews.

Individual Reliability

Commanders ensure that only trained, certified, and reliable people have access to nuclear weapons, delivery systems, and command and control systems. The PRP and AUoF are used to initially qualify, certify, and then monitor personnel assigned to nuclear operations tasks throughout their assignment. Both programs ensure only those persons whose behavior demonstrates integrity, reliability, trustworthiness, allegiance, and loyalty to the United States shall be allowed to perform duties associated with nuclear weapons. The Air Force also employs techniques such as the Two-Person Concept in all nuclear operations to ensure compliance with established procedures. The Two-Person Concept requires the presence at all times of at least two authorized persons, each certified under a personnel reliability assurance program, knowledgeable in the task to be performed, familiar with applicable safety and security requirements, and each capable of promptly detecting an incorrect act or improper procedure with respect to the task to be performed.