

**AIR FORCE DOCTRINE PUBLICATION 3-72**

**NUCLEAR OPERATIONS**



**U.S. AIR FORCE**

18 December 2020



# CURTIS E. LEMAY CENTER

FOR DOCTRINE DEVELOPMENT AND EDUCATION



## [AIR FORCE DOCTRINE PUBLICATION \(AFDP\) 3-72](#) [NUCLEAR OPERATIONS](#)

### CATALOG OF DOCTRINE TOPICS

---

Last Updated: 18 December 2020

#### **Introduction to Nuclear Operations**

#### **Fundamentals of Nuclear Operations**

#### **Strategic Effects of Nuclear Operations**

- Deterrence
- Extended Deterrence
- Assurance
- Dissuasion
- Defeat

#### **Presentation of Nuclear Forces**

#### **Nuclear Command, Control, and Communications**

#### **Planning Considerations**

#### **Nuclear Surety**

---



# CURTIS E. LEMAY CENTER

FOR DOCTRINE DEVELOPMENT AND EDUCATION



## AIR FORCE DOCTRINE PUBLICATION (AFDP) 3-72 NUCLEAR OPERATIONS

### INTRODUCTION TO NUCLEAR OPERATIONS

Last Updated: 18 December 2020

Nuclear operations are a key component to the success of [joint all-domain operations](#) and critical to this current era of great power competition, especially as it pertains to deterrence. The Air Force’s responsibilities in nuclear operations are to organize, train, equip, and sustain forces with the capability to support national security objectives. In support of the [National Security Strategy](#) and [National Defense Strategy](#), US nuclear operations promote security and stability by:

- ★ Deterring nuclear and non-nuclear attacks on the US and its interests.
- ★ Assuring allies and partners.
- ★ Achieving US objectives if deterrence fails.
- ★ Hedging against an uncertain future.

Nuclear weapons remain important in the current global environment. Our nuclear deterrent is the ultimate protection against a nuclear attack on the US, and through [extended deterrence](#), also assures the security of our allies and partners 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.

*“Nuclear weapons have served a vital purpose in America’s National Security Strategy for the past 70 years. They are the foundation of our strategy to preserve peace and stability by deterring aggression against the United States, our allies, and our partners. While nuclear deterrence strategies cannot prevent all conflict, they are essential to prevent nuclear attack, non-nuclear strategic attacks, and large-scale conventional aggression. In addition, the extension of the U.S. nuclear deterrent to more than 30 allies and partners helps to assure their security and reduces their need to possess their own nuclear capabilities.”*

-- [2017 National Security Strategy](#)

Paradoxically, while the number of nuclear powers has increased since the end of the Cold War, the total number of nuclear weapons has decreased. Fewer US nuclear weapons have forced a

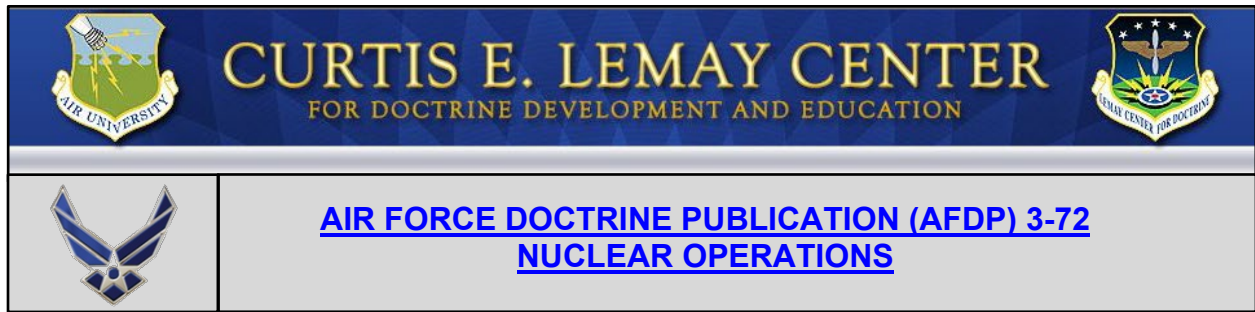
transformation in Air Force thinking and analysis, especially in a military environment that has grown more complex due to conventional capabilities, missile defense, and the proliferation of anti-access and area denial capabilities. Maintaining strategic stability will be an important challenge in the 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 its own decision calculus. US decision makers, including [combatant commanders](#), subordinate [joint force commanders](#), and commanders and staffs of Air Force components, require an understanding of both adversary and ally decision-making processes and behaviors and consideration of second- and third-order effects of their decisions. Just as the understanding of US decision makers may fall short, foreign actors may possess a limited ability, if any, to correctly discern US operations, detect changes in US posture, or recognize US intent. Nuclear operations in a proliferated, multipolar world cannot be conducted using bipolar, Cold War paradigms.

This AFDP is arranged around the following key related topics:

- ★ “[Fundamentals of Nuclear Operations](#)” presents a discussion of nuclear weapons employment policies.
- ★ “[Strategic Effects of Nuclear Operations](#)” presents a 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 the processes and characteristics associated with nuclear command and control.
- ★ “[Planning Considerations](#)” presents high-level considerations of nuclear planning and the post-strike environment.
- ★ “[Nuclear Surety](#)” presents an overview of surety and the subordinate topics of safety, security, and reliability.

Normally, doctrine provides guidance to commanders for their consideration in campaign design as well as during execution of an operation, as they adjust their forces to seize opportunities and respond to adversary actions. 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 using 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 for 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: 18 December 2020

The end of the Cold War has had a major impact on the role of nuclear weapons in US national security strategies. Tensions between former Cold War adversaries were reduced following the collapse of the Soviet Union. This, coupled with advances in technology, enabled arms control treaties to bring about dramatic nuclear force reductions. However, so long as nuclear weapons exist, the possibility of their use remains. Today, the strategic environment is becoming very complex, aggravated by increasingly aggressive behavior of adversaries, nuclear modernization or recapitalization, and the persistent threat of nuclear proliferation. While the prospect of a massive nuclear exchange seems remote, the potential still exists. For this reason, nuclear weapons are just as important now as they have ever been.

The Air Force may need to develop new concepts, systems, and procedures in response to changes in US nuclear policy. For instance, the concepts of “mutual assured destruction” and “flexible response” required the Air Force to employ multiple weapon systems, different plans, and differing degrees of survivability for command and control systems. Because US policy on employing nuclear weapons to respond to an adversary’s battlefield use of [weapons of mass destruction](#) (WMD) is purposely vague, the Air Force must be prepared to respond in a wide variety of ways with the nuclear forces required by the combatant commander and approved by the President of the United States. The ambiguous nature of US policy makes it difficult for an adversary to predict how the US may respond, or to assume such a response would not be forthcoming. Even though there is no guarantee nuclear force would be used in response to a WMD attack, planners are responsible for making alternative options available for civilian policymakers.

To maintain credibility, Airmen must be ready at all times to respond to requests from the President and his or her advisors via the Chairman of the Joint Chiefs of Staff to employ nuclear weapons. The inability of nuclear forces to respond quickly could undermine the value of deterrence and assurance.

The employment of nuclear weapons is normally considered a form of strategic attack. Strategic attack is “**offensive action specifically selected to achieve national strategic objectives. These attacks seek to weaken the adversary’s ability or will**

**to engage in or escalate conflict, and may achieve strategic objectives without necessarily having to achieve operational objectives as a precondition”** (AFDP 3-70, [Strategic Attack](#)). 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 OF NUCLEAR OPERATIONS**

Last Updated: 18 December 2020

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. Each Air Force nuclear-capable system offers distinct advantages. ICBMs are the most responsive, offering prompt, on-alert capability combined with dispersed fielding. Dual-capable aircraft offer mission flexibility and capabilities to provide distinct signaling in a crisis through alert posturing and 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, dissuade, or defeat. This credibility is communicated through messaging opportunities such as weapon system testing, nuclear exercises, alert posturing, and shows of force.

Deterrence, assurance, and dissuasion may be implemented independently or in conjunction with operations at any point across the range of military operations throughout the [competition continuum](#). Although deterrence activities are more typically envisioned as occurring during shaping or deter activities within the [joint operation model](#), deterrence

may actually occur during any activities across the joint operation model. Influencing an adversary’s risk-benefit calculus to reduce their available options, a form of escalation

### **Shows of Force**

A show of force is defined as “**an operation planned 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**” (JP 3-0, [Joint Operations](#)).

Shows of force are frequently used to deter adversaries and assure allies and partners, frequently in the same stroke. The deployment of an additional number of bombers or fighters to a tense region is an example using Air Force capabilities.

control, can take place while other operations (including other nuclear and non-nuclear operations) are ongoing.

*“The Air Force sent groups of B-52s to the Pacific and Europe as bomber task force deployments within two days this week, prompting Russia to intercept one.*

*On June 15, two B-52Hs from the 5th Bomb Wing at Minot Air Force Base, ND, flew a long-distance strategic Bomber Task Force mission through Europe and the Baltics, where they participated in the NATO-led Baltic Operations [BALTOPS] exercise...*

*“Long-range strategic bomber missions to the Baltic region are a visible demonstration of our capability to extend deterrence globally,” [US Air Forces Europe] boss Gen. Jeffrey Harrigian said in the release. “Our participation in BALTOPS also provides an opportunity for us to strengthen relationships with our NATO allies and partners while operating in the air and sea domains....”*

*“The deployments are the latest in the Air Force’s dynamic force employment model of sending bombers abroad, following the end of the Service’s continuous bomber presence in the Pacific.*

*Instead of long-term deployments, the Service is currently focusing on sending small groups of bombers on short-notice flights across the globe to be more unpredictable.”*

-- [“B-52 Task Forces Head to Eastern Europe, Alaska”](#)  
Air Force Magazine, 15 June 2020

For additional discussion on deterrence, assurance, and dissuasion, see also [“Practical Design: The Coercion Continuum”](#) in AFDP 3-0, [Operations and Planning](#).

---





# CURTIS E. LEMAY CENTER

FOR DOCTRINE DEVELOPMENT AND EDUCATION



## AIR FORCE DOCTRINE PUBLICATION (AFDP) 3-72 NUCLEAR OPERATIONS

### DETERRENCE

Last Updated: 18 December 2020

“Deterrence prevents adversary action through the presentation of a credible threat of unacceptable counteraction and belief that the cost of the action outweighs the perceived benefits” (Joint Publication [JP] 3-0, [Joint Operations](#)). Deterrence is critical to US national security efforts. Even though both nuclear and conventional operations contribute to the effect, nuclear capabilities are the foundation that underpins all other elements of deterrence.

*“The fundamental reasons why US nuclear capabilities and deterrence strategies are necessary for US, allied, and partner security are readily apparent. US nuclear capabilities make essential contributions to the deterrence of nuclear and non-nuclear aggression. The deterrence effects they provide are unique and essential to preventing adversary nuclear attacks, which is the highest priority of the United States.*

*US nuclear capabilities cannot prevent all conflict and should not be expected to do so. But they contribute uniquely to the deterrence of both nuclear and non-nuclear aggression. They are essential for these purposes and will be so for the foreseeable future. Non-nuclear forces also play essential deterrence roles, but do not provide comparable deterrence effects--as is reflected by past, periodic, and catastrophic failures of conventional deterrence to prevent Great Power war before the advent of nuclear deterrence. In addition, conventional forces alone are inadequate to assure many allies who rightly place enormous value on US extended nuclear deterrence for their security, which correspondingly is also key to non-proliferation.”*

-- [2018 Nuclear Posture Review](#)

[Deterrence](#) should be based on capability, credibility, and communication to ensure greater effectiveness.

**Capability** consists of having the means to influence behavior. For effective deterrence, a range of flexible nuclear capabilities should be maintained to ensure that nuclear or non-nuclear aggression against the US, allies, and partners will fail to achieve its objectives and carry with it the credible risk of intolerable consequences for the adversary. Nuclear force capabilities should be diverse, flexible, adaptable, effective, responsive, and survivable.

**Credibility** consists of maintaining a level of believability that the proposed actions may actually be employed. Credibility depends on the appearance of the deterrent from the adversary's point of view. For effective deterrence, credibility hinges on having a convincing capability to execute a variety of nuclear and non-nuclear options and a willingness to employ these options.

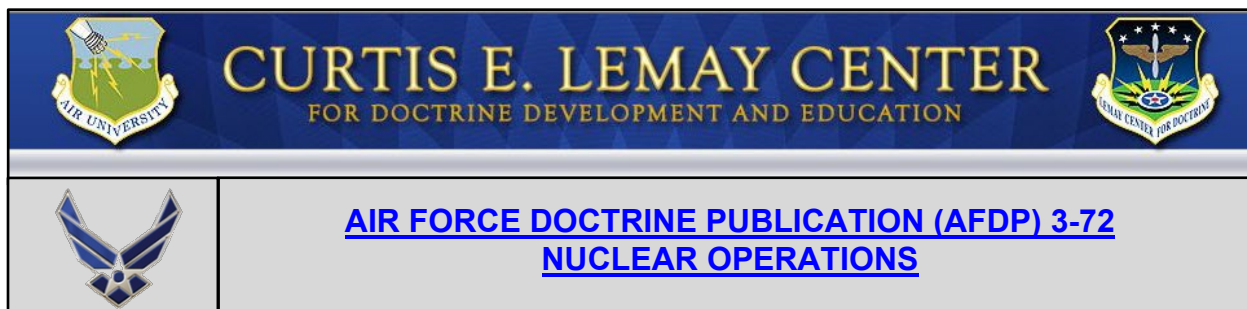
**Communication** consists of transmitting the intended message to the desired audience. For effective deterrence, this messaging should articulate US resolve to employ capabilities that deny the benefits of adversary action and impose costs on them. Messaging opportunities include weapon system testing, nuclear exercises, alert posturing, and shows of force.

### **Global Thunder and Global Lightning**

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 forces can be used to deter conventional and other non-nuclear threats. Forces used in support of nuclear operations may be tied to more complex and dynamic situations, combining both conventional and nuclear operations which may require integration across multiple domains and environments. Today's Air Force recognizes that many adversaries are willing to employ nuclear operations under many different circumstances.

For additional discussion on effects, see "[Practical Design: The Coercion Continuum](#)" in AFDP 3-0, [Operations and Planning](#).



---

## EXTENDED DETERRENCE

Last Updated: 18 December 2020

Extended deterrence is a commitment to deter and, if necessary, to respond across the spectrum of potential nuclear and non-nuclear scenarios in defense of allies and partners. This commitment is often described as providing a “nuclear umbrella.” Extended deterrence also serves as a nonproliferation tool by obviating the need for allies and partners to develop or acquire and field their own nuclear arsenals.

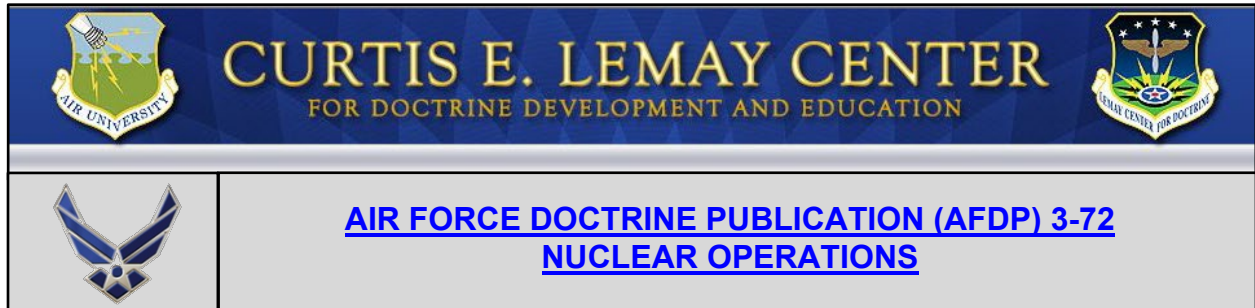
In the case of the [North Atlantic Treaty Organization](#) (NATO), the continued deployment of US nuclear weapons in Europe is a strategic alliance issue. This ongoing forward basing of US nuclear capabilities not only deters adversaries on behalf of European allies, but also assures NATO partners that the US is capable of helping ensure their collective national security.

According to the [NATO Deterrence and Defence Posture Review](#), “Nuclear weapons are a core component of NATO’s overall capabilities for deterrence and defense alongside conventional and missile defense forces.... Consistent with our commitment to remain a nuclear alliance for as long as nuclear weapons exist, Allies agree...to develop concepts for how to ensure broadest possible participation of Allies concerned in their nuclear sharing arrangements.” The US also provides a nuclear umbrella over several Pacific partners including [Japan](#), [South Korea](#), and [Australia](#).

Complementing extended deterrence, where the objective is to influence the decision-making of an adversary, [assurance](#) involves easing the fears and sensitivities of allies and partners. Extended deterrence and assurance of allies and partners are two sides of the same coin. For example, [shows of force](#) shape both allied and adversary beliefs.

For additional discussion on effects, see “[Practical Design: The Coercion Continuum](#)” in AFDP 3-0, [Operations and Planning](#).

---



---

## ASSURANCE

Last Updated: 18 December 2020

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

US assurance of allies and partners is 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 [North Atlantic Treaty Organization](#) partners.

The Air Force contributes to assurance through [shows of force](#), which shape both allied and adversary beliefs. These shows of force could include the deployment of dual-capable aircraft to a tense region or operational test launches of intercontinental ballistic missiles.

As threats increase, allies and partners could demand tangible assurance from the US. This, in turn, could drive demands on force structure and capability requirements.

For additional discussion on effects, see "[Practical Design: The Coercion Continuum](#)" in AFDP 3-0, [Operations and Planning](#).

---



## DISSUASION

Last Updated: 18 December 2020

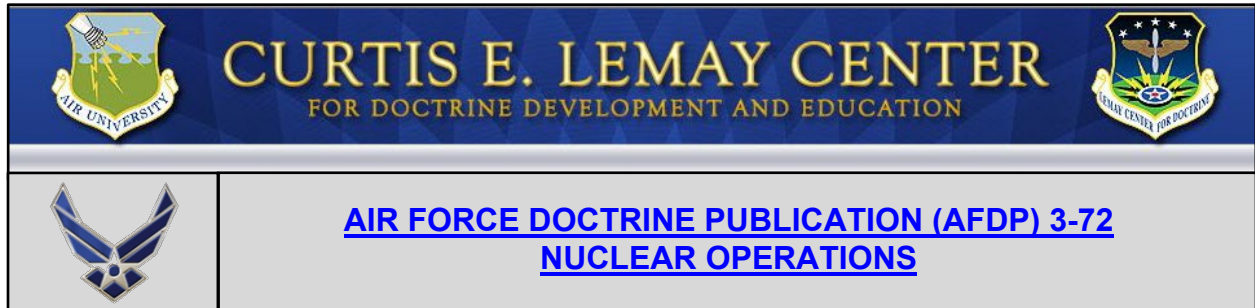
Dissuasion, also closely related to [deterrence](#), consists of actions taken to demonstrate to an adversary that a particular course of action is too costly, or that the benefits are too meager to justify the cost. The intent is to dissuade potential adversaries from embarking on programs or activities 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 preventing the adversary from developing or acquiring nuclear capabilities. Dissuasion is most often conducted using [instruments of national power](#) in concert. Air Force nuclear forces may play an important role in this, most likely by providing a credible deterrent.

### **Operation IRAQI FREEDOM and Libyan Weapons of Mass Destruction**

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

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 in their decision to shut down its WMD program.

For additional discussion on effects, see "[Practical Design: The Coercion Continuum](#)" in AFDP 3-0, [Operations and Planning](#).



## DEFEAT

Last Updated: 18 December 2020

To convince an adversary to surrender or to end a war on terms favorable to the US, 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 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 is 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 US is a tangible demonstration of our resolve and likely to affect our ability to defeat the will of an enemy.

Nuclear weapons have only been employed in combat twice; the US struck the Japanese cities of Hiroshima and Nagasaki in August 1945 to facilitate an end to World War II in the Pacific.

## Effects of Atomic Bombings During World War II

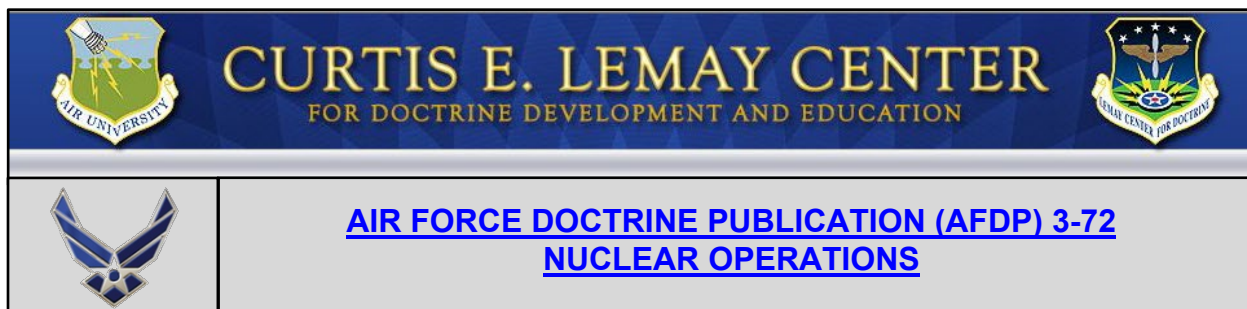
*“The atomic bombings considerably speeded up [the] political maneuvering within the [Japanese] government. This in itself was partly a morale effect, since there is ample evidence that members of the Cabinet were worried by the prospect of further atomic bombings, especially on the remains of Tokyo. 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 Kamikaze, 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 AFDP 3-0, [Operations and Planning](#).

---



## PRESENTATION OF NUCLEAR FORCES

Last Updated: 18 December 2020

The command structure established by the Commander, [US Strategic Command](#) (USSTRATCOM) is different than other combatant command 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 three joint force component commands (JFCCs) in lieu of standing joint task forces. The roles and responsibilities of the JFCCs vary, as do the command relationships of the supporting Service components. As a result of this organization, care should be taken to understand the various command arrangements, the disposition of [command authorities](#), and the 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 describes how nuclear force providers present their forces on a day-to-day basis to USSTRATCOM.

### ORGANIZATION OF NUCLEAR FORCES

The Air Force employs forces for USSTRATCOM through the [joint force air component commander](#) (JFACC).

While the JFACC has [tactical control](#) (TACON) of assigned or attached forces for non-nuclear operations, this is not the case for nuclear operations.

Forces assigned to the Commander, USSTRATCOM (CDRUSSTRATCOM) include B-2, B-52, and E-4B aircraft; intercontinental ballistic missiles (ICBMs); and helicopters. CDRUSSTRATCOM delegates [operational control](#) (OPCON) of assigned and attached Air Force forces to the Air Force component commander (the [commander, Air Force forces](#) [COMAFFOR]) assigned to CDRUSSTRATCOM, i.e., Commander, Air Force Global Strike Command (AFGSC/CC). As the commander of a component major command, AFGSC/CC further divides their responsibilities into operational branch authority as Commander, Air Forces Strategic (COMAFSTRAT) and administrative branch authority as AFGSC/CC. COMAFSTRAT exercises OPCON of assigned and attached Air Force forces as delegated by the CDRUSSTRATCOM.



CDRUSSTRATCOM uniquely retains TACON of generated nuclear forces at all times. Thus, for nuclear operations, COMAFSTRAT is a force provider.

The AFGSC/CC is further designated as the JFACC to CDRUSSTRATCOM. As JFACC, AFGSC/CC provides daily monitoring of those joint forces made available, command and control (C2) in peacetime, and during non-nuclear global strike operations to accomplish tasked missions. JFACC authorities and responsibilities differ from those described in doctrine for non-nuclear operations in part because nuclear planning and nuclear C2 are not conducted at the component level.

As the Air Force component commander to CDRUSSTRATCOM, AFGSC/CC exercises [administrative control](#) (ADCON) over Air Force forces as delegated by the Air Force, and OPCON over assigned and attached Air Force forces as delegated by CDRUSSTRATCOM.

AFGSC/CC exercises C2 over ICBMs, bombers, and other assigned aircraft through the 608th Air Operations Center (AOC) while Commander, Air Mobility Command (AMC/CC) exercises C2 over tanker and mobility aircraft through the 618 AOC. The 608 AOC and 618 AOC have a [coordinating](#) relationship.

These unique delegations of command authorities are codified in two annually revised USSTRATCOM operation orders (OPORDs).

## **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). These NAF commanders exercise ADCON over their respective forces. The Commander, 8 AF (8 AF/CC), is dual-hatted as Commander, Joint-Global Strike Operations Center (J-GSOC).

8 AF/CC exercises TACON of LOOKING GLASS, Take Charge and Move Out (TACAMO) as delegated by CDRUSSTRATCOM through OPORDs.

Within the NAFs, forces are arrayed internally into wings, groups, and squadrons as necessary to provide internal span of control. Unlike the Air Force doctrine organizational model for non-nuclear operations executed on a regular and recurring basis, there is no single [air expeditionary task force](#) for nuclear operations. However, bomber task force missions occur on a routine basis, performing nuclear deterrence operations in support of current operation plans objectives.

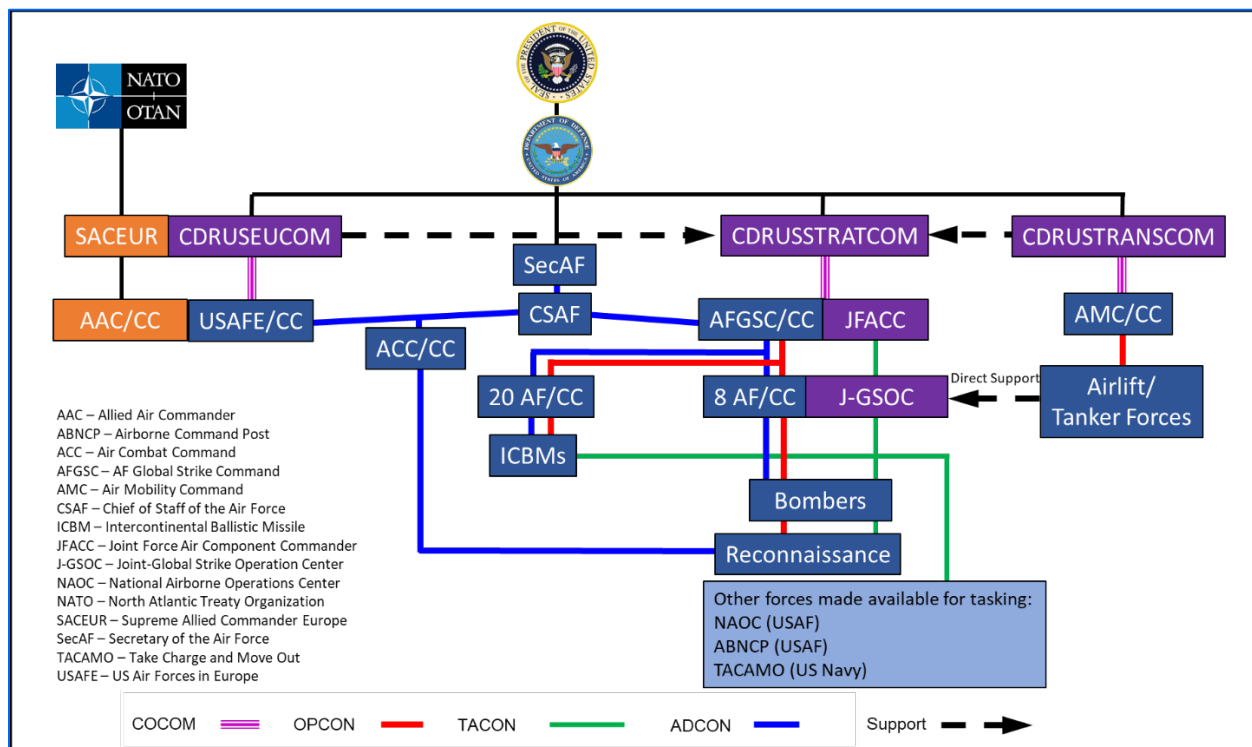
USTRANSCOM through Air Mobility Command provides air refueling and airlift forces in direct [support](#) of USSTRATCOM.

AFGSC/CC via J-GSOC (8 AF/CC) exercises ADCON of National Airborne Command Post (NAOC) aircraft (E-4B) assigned to the 595th Command and Control Group, while

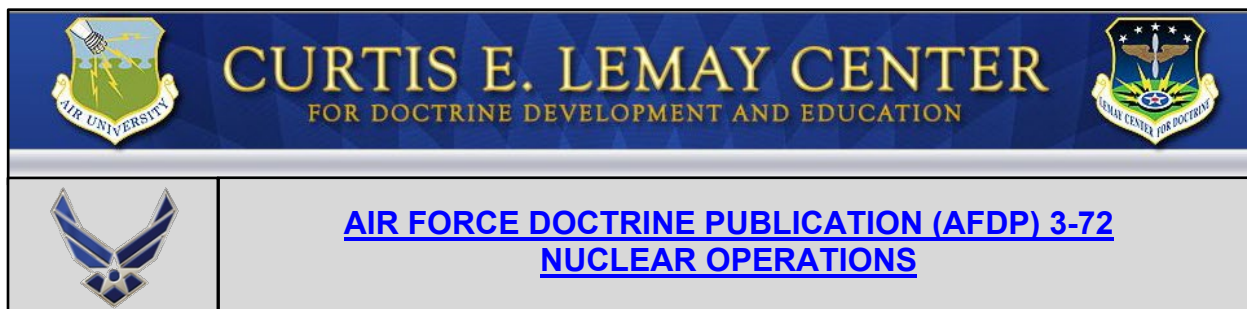
CDRUSSTRATCOM exercises OPCON of non-alert NAOC aircraft and the Chairman, Joint Chiefs of Staff (CJCS) exercises OPCON of the alert NAOC.

Air Combat Command provides reconnaissance in support of nuclear operations aircraft for USSTRATCOM. Commander, Air Combat Command, retains ADCON of these forces. When reconnaissance aircraft are generated, they are transferred with the specification of OPCON to the J-GSOC (8 AF/CC) via the 608 AOC.

The Commander, US Air Forces Europe (USAFE/CC) provides dual-capable fighter aircraft to the Commander, [US European Command](#) (CDRUSEUCOM). The USAFE/CC is also dual hatted as the Commander, Allied Air Command to the [North Atlantic Treaty Organization](#). In the relationship with CDRUSSTRATCOM, CDRUSEUCOM is the supported commander for planning. At the same time, CDRUSEUCOM is the supporting commander for execution. In the execution of nuclear strikes, CDRUSSTRATCOM has no authority over weapons assigned to USAFE/CC.



## Air Force Organization for Nuclear Operations



## **NUCLEAR COMMAND, CONTROL, AND COMMUNICATIONS**

Last Updated: 18 December 2020

The nuclear command, control, and communications (NC3) system refers to the “means through which Presidential authority is exercised and operational command and control of nuclear operations is conducted. The NC3 system is part of the larger national leadership command capability (NLCC), which encompasses the three broad mission areas of: (1) Presidential and senior leader communications; (2) NC3; and (3) continuity of operations and continuity of government communications” (Air Force Instruction 13-550, [Air Force Nuclear Command, Control, and Communications \(NC3\)](#)).

The Air Force Global Strike Command (AFGSC)-supported Air Force Nuclear Command Control and Communications Center (AFNC3C) is responsible for lead command management and centralized organize, train, and equip functions of the Air Force NC3 weapon system (AN/USQ-225), comprising terminals, radios, direct ancillary communications devices, and support equipment for the execution of 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 is a foundational capability of the Air Force and undergirds US national defense policy.

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 nuclear command and control (NC2) capabilities disseminate warning information and nuclear control orders and add significant resilience to the NC3 system of systems. NC2 is the exercise of authority and direction by the President, as Commander-in-Chief of the US Armed Forces, through established national command authority lines over nuclear weapons, nuclear weapon systems, and nuclear weapon operations of military forces. Resilient NC3 contributes to stability by convincing adversaries that they cannot execute an attack against the US or its allies and partners

without suffering the consequences of a nuclear response. NC2 mission essential functions include force management, planning, situation monitoring, decision making, and force direction.

When conducting conventional-nuclear integration (CNI) operations, command and control relationships may be different than those described in AFDP 3-30, [Command and Control](#). For example, Commander, US Strategic Command could control nuclear bombers while the [combatant commander](#) with an area of responsibility executes command and control of conventional forces in either a Conventional Conflict with a Nuclear Element or a Conventional Support to Nuclear Operations scenario. While CNI may improve [unity of effort](#), it may pose [unity of command](#) challenges.

## NUCLEAR COMMAND AND CONTROL SYSTEM

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

### The Nuclear Command and Control System

*"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 [Department of Defense] 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 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 during and after nuclear attack so that no adversary is capable of a disarming first strike.

## **POSITIVE CONTROL**

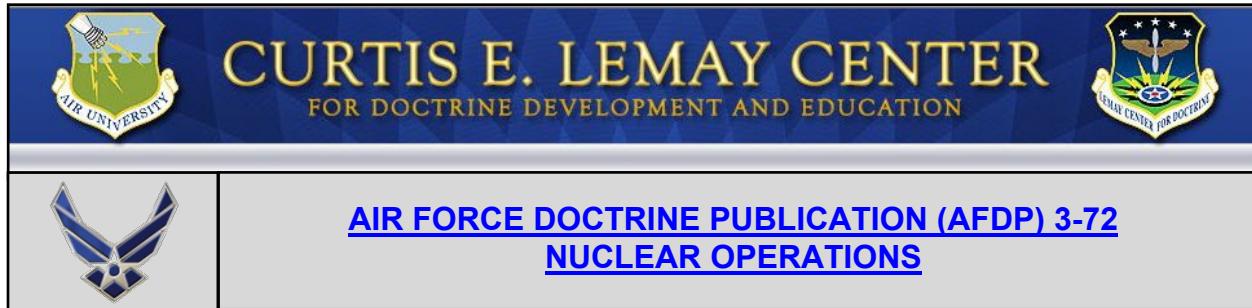
The President may direct the use of nuclear weapons through an execute order via the Chairman of the Joint Chiefs of Staff to the combatant commanders and, ultimately, to the forces in the field exercising direct control of the weapons.

Execution of these orders through emergency action procedures allow for a timely response to an emergency action message and ensure the directive 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**

Cryptologic systems are used to validate the authenticity of nuclear orders to prevent unauthorized employment of nuclear weapons. Access to these systems and codes, and knowledge of these procedures are tightly controlled to prevent access by unauthorized individuals to the means and methods to order or terminate nuclear weapons employment. Once appropriate orders have been sent, weapon system operators must respond in a timely manner using standardized procedures.

---



## PLANNING CONSIDERATIONS

Last Updated: 18 December 2020

[US Strategic Command](#) (USSTRATCOM) is tasked by the Joint Strategic Campaign Plan to provide specific support to [combatant commanders](#) (CCDRs) for their nuclear planning. Planning for nuclear operations differs in one important aspect from other forms of joint 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. 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; identify conventional and nuclear acceptable levels of risk; 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 theater commands may collaborate on matters of weapon system capabilities and regional issues. Additionally, planners should coordinate with joint and coalition forces to deconflict nuclear weapons effects and prevent friendly fire. Planners and support staffs should continually update senior leaders and inform representatives of coalition forces while maintaining the proper balance of operational security and cohesiveness.

Air Force nuclear capabilities require robust integration with full spectrum operations to ensure effective employment within a particular region, account for larger political ramifications, and allow effective operations in a nuclear environment. Planners may

integrate nuclear options with conventional or other non-nuclear operations to enhance effectiveness and minimize collateral effects. In some scenarios, the delivery of nuclear weapons may require conventional support in the form of [counterair operations](#), [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 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 with combined 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 diminishment of one weapon's effects by detonation of another, may 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 to prevent fratricide and friendly fire incidents.

The significant destructive power and other related effects from nuclear weapons demand 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 doctrine and strategy for use of nuclear weapons, especially whether there is a declared "first use" strategy and when adversary employment of nuclear weapons is most likely 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 accurate receipt of 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 when anticipating other countries' actions may lead commanders to wrongly believe that an adversary would be willing or even unwilling to use nuclear weapons in a given scenario. Additionally, escalation control relies heavily on each side of a conflict understanding the intent of the other. For example, what one commander believes is an example showing restraint, may actually be perceived as an escalatory action by the adversary. Rational behavior should be determined through the lens of cultural and historical context to properly anticipate an adversary's response to US nuclear operations.

Finally, commanders of nuclear forces should take coalition perceptions of nuclear operations into account to not risk failure to achieve national strategic objectives when providing national leadership recommendations.

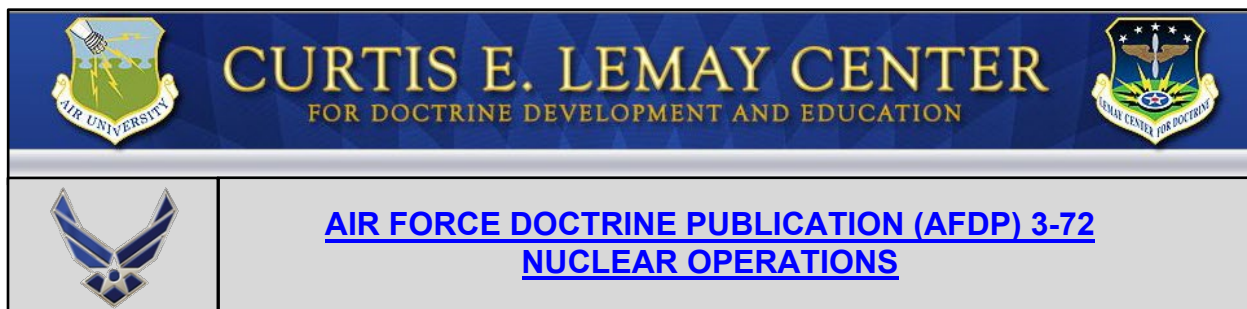
## POST-STRIKE ENVIRONMENT

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. The most important factor in mitigating damage from a nuclear detonation is advanced warning. Advanced warning allows friendly forces and civilians the best chance of getting to shelter and surviving.

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 defense—avoidance, protection, and decontamination—will help preserve the fighting capability of forces. AFDP 3-40, [\*Counter Weapons of Mass Destruction \(WMD\) Operations\*](#), Joint Publication (JP) 3-40, [\*Joint Countering Weapons of Mass Destruction\*](#), JP 3-11, [\*Operations in Chemical, Biological, Radiological, and Nuclear Environments\*](#), and JP 3-41, [\*Chemical, Biological, Radiological, and Nuclear Response\*](#), provide additional guidance.

---





## NUCLEAR SURETY

Last Updated: 18 December 2020

The Air Force implements a stringent nuclear surety program to ensure 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 purpose of the Air Force Nuclear Weapons Surety Program is to incorporate maximum nuclear weapons surety, consistent with operational requirements, from weapon system development to target or dismantlement” (Air Force Instruction [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 as well as allies and partners should be highly confident of the Air Force’s ability to secure nuclear weapons from accidents, theft, loss, and accidental or unauthorized use. This commitment to precise and reliable nuclear operations is a cornerstone to the credibility of deterrence.

Per Department of Defense (DoD) Directive 3150.02, [DoD Nuclear Weapons Surety Program](#), “Four 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** pre-arming, arming, launching, or releasing of nuclear weapons, except upon execution of emergency war orders or when directed by competent authority.

- ✦ Prevent **inadvertent** pre-arming, arming, launching, or releasing of nuclear weapons in all normal and credible abnormal environments.
- ✦ Ensure adequate security of nuclear weapons.”

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, combatant commanders should consider the additional needs incurred if nuclear weapons are deployed into their areas 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. See Department of Defense Manual (DoDM) 3150.02, [DoD Nuclear Weapon System Safety Program Manual](#), for responsibilities and procedures.

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. These 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 Assurance Program (PRAP), 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](#); AFI 31-117, [Arming and Use of Force by Air Force Personnel](#); DoDM 5210.42, [Nuclear Weapons Personnel Reliability Program](#), and AFMAN 13-501, [Nuclear Weapons Personnel Reliability Program \(PRP\)](#); for more specific guidance.

## **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 characteristics. 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, 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 operations. Nuclear weapons are most vulnerable in transit or when deployed for use, so special care must be taken at those times. Air Force policies that outline security requirements for nuclear operations must be understood by all appropriate personnel.

Normally, 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, enhance the effectiveness of nuclear deterrence, and contribute to the security of nuclear weapons, especially against the threats of sabotage and terrorism” (DoD Instruction 5230.16, [Nuclear-Radiological Incident Public Affairs Guidance \(PA\)](#)). Only two exceptions exist: (1) The DoD Incident Commander (IC) is “required to confirm the presence of US nuclear weapons or radioactive nuclear components in the interest of public safety if the public is, or may be, in danger of radiation exposure or other danger posed by the weapon” and (2) The DoD IC “may confirm or deny the presence of US nuclear weapons to reduce or prevent widespread public alarm” (DoDM 3150.08, [Nuclear Weapon Accident Response Procedures](#)).

## **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. PRAP is used to initially qualify, certify, and then monitor personnel assigned to nuclear operations tasks throughout their assignment. Commanders and PRAP ensure only those persons whose behavior demonstrates integrity, reliability, trustworthiness, allegiance, and loyalty to the US are 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 PRAP, 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.

---