AIR FORCE DOCTRINE PUBLICATION 3-40

COUNTERING WEAPONS OF MASS DESTRUCTION OPERATIONS

U.S. AIR FORCE

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Air Force Doctrine Publication 3-40, *Countering Weapons of Mass Destruction Operations*

Table of Contents

FOREWORD

The United States faces a rapidly evolving and dynamic threat environment that includes adversaries with weapons of mass destruction (WMD). This publication has been revised to reflect the current Department of War (DoW) policy for countering WMD. The previous revision of AFDP 3-40 focused primarily on counterterrorism and counterinsurgency operations and the management of risks emanating from hostile, fragile, or failed states and safe havens. Although this threat remains, the increased risk of chemical, biological, radiological, or nuclear (CBRN) exposure from global competitors to the United States, our allies, and our partners warrants greater attention. The current security environment, characterized by state and non-state adversaries in possession of legacy and emerging WMD technology, requires Airmen to adopt a renewed emphasis on deliberate planning and CBRN training in preparation for military conflict.

Countering WMD (CWMD) operations include efforts to prevent or degrade WMD proliferation, defend the homeland from WMD attacks, manage existing threats through credible deterrence, mitigate effects of WMD should an attack occur, and remain effective throughout a CBRN attack to support operational objectives. This requires Airmen to be trained to plan operations in a distributed or decentralized manner and prepared to execute the mission when isolated from higher echelons. Airmen at all levels should be capable of making decisions independently, operating based on commander's intent and the principles of mission command before, during, and after a CBRN attack.

CHAPTER 1: INTRODUCTION TO COUNTERING WEAPONS OF MASS DESTRUCTION

From the infamous chemical attacks prevalent in World War I to the threat of nuclear exchange during the Cold War, weapons of mass destruction (WMD) have long posed a multifaceted and complex threat to the security of the United States (US), allies, and partners.

WMD are chemical, biological, radiological, and nuclear (CBRN) weapons capable of a high order of destruction or causing mass casualties. Attacks with such weapons are capable of significant political and psychological effects beyond the immediate impact on military operations. Whether aiming to counter US conventional military superiority, gain strategic advantage, or destabilize the international order in their favor, adversaries will continue to pursue WMD, advance their lethality, and facilitate their proliferation.

CBRN weapons carry the potential to significantly degrade United States Air Force (USAF) operations. Mass casualties could overwhelm medical staff, exceed facility capacities, and exhaust medical countermeasures. Implementing protective measures to mitigate contamination may negatively affect the operational tempo. Communication nodes could be disrupted, and command and control (C2) assets can become overburdened, degrading capacity and situational awareness at all levels. Contaminated airfields could reduce sortie generation, impede execution of the air tasking order (ATO), and hamper the flow of logistics, delaying forward movement and resupply. Anticipating such challenges will enable commanders and their staff to develop effective response plans, realistic exercises, and appropriate courses of action (COAs). The knowledge derived from planning and preparation will also inform commanders of critical gaps in equipment, manning, and capabilities. Finally, understanding such shortfalls will inform CBRN defense modernization efforts necessary for success in a contested environment.

CBRN WEAPONS CHARACTERISTICS

Different CBRN-related materials and agents are characterized by varying degrees of lethality, persistence, and destructive capability. CBRN agents may be combined and employed together or delivered via unconventional methods. Factors such as complexity, physical or chemical composition, and delivery method all influence the scale of contamination and level of physical destruction. Similarly, these variables present challenges for the detection, protection, and treatment of casualties. Finally, environmental factors such as weather, terrain, and physical medium can influence the effects and severity of injuries. In all cases, the use of these weapons will likely result in psychological trauma, from short-term effects on economic resources to widespread post-traumatic stress.[1]

[1] For additional information on CBRN weapons and their effects, see Joint Publication (JP) 3-11, *Operations in Chemical, Biological, Radiological, and Nuclear (CBRN) Environments*.

CHEMICAL

A chemical agent is a chemical substance intended for use in military operations to kill, seriously injure, or incapacitate mainly through its physiological effects. Chemical weapons are categorized according to their physical effects on the human body and the time the agents remain effective (persistence). They consist of choking agents, blister agents, blood agents, nerve agents, and incapacitating agents. Large quantities may be needed to cause mass casualties. However, because of the potential for severe psychological effects, even a limited attack can have a significant adverse operational impact. Though chemical weapons may be manufactured in facilities designed specifically for military purposes, many can also be manufactured using technologies and facilities commonly available in non-military industries (known as dual-use technology). The ubiquity and availability of dual-use technology, coupled with the potential for small quantities of chemical agents to generate widespread effects, can make chemical weapons manufacturing difficult to detect and assess. Some countries no longer stockpile large amounts of chemical warfare agents. While many countries are assessed to have retained the ability to produce chemical weapons, they appear to have adopted a strategy of just-in-time production.

BIOLOGICAL

Biological agents can occur naturally or be manufactured and can cause widespread illness in human populations, livestock, or crops. Pathogens, including bacteria, viruses, and fungi, have different incubation times and lethality and can enter the body through the lungs, digestive tract, mucous membranes, or wounds to the skin. Biological agents also include toxins (poisonous byproducts of microorganisms, plants, and animals) that interfere with cell and tissue functions. Biological warfare agents may be produced in universities, hospitals, and industrial-sized fermentation facilities. They can also be produced in clandestine, covertly funded laboratories operating under the auspices of pharmaceutical research. Both small-scale and large-scale production can leverage dual-use technologies, presenting challenges for detection and identification.

RADIOLOGICAL

Radiation is energy. As such, personnel may be harmed even if not in direct physical contact with radioactive material. The term radiation, in this context, refers to ionizing radiation capable of penetrating matter, emitted by radioactive material or resulting from nuclear reactions. Each radiation type is capable of harm by damaging or destroying cell tissue and deoxyribonucleic acid (DNA). While nuclear weapon detonation is known for producing large amounts of immediate radiation and radioactive fallout, adversaries can also disperse radiation from other sources, including medical, security, and industrial equipment and waste. Radiation cannot be neutralized or sterilized. Further, radiological material may remain hazardous for many years. Respiratory protection can prevent inhalation of airborne radiological contaminants. Likewise, personal protective equipment (PPE) can protect against contact and penetration effects of alpha and some beta radiation. However, adequate protection from gamma and neutron radiation can only be provided by minimizing exposure time, ensuring a safe distance from emitting material, or shielding with material to prevent or reduce radiation penetration.

NUCLEAR

The technologies involved with the development, production, and physical effects of nuclear weapons are well known. However, the greatest challenge in creating a functioning weapon is acquiring enough weapons-grade fissile material (i.e., highly enriched uranium or plutonium, neither of which occurs naturally in sufficient quantities). Nuclear weapons effects include blast, intense flash, heat, ionizing radiation, radioactive fallout, and electromagnetic pulse (EMP). They have the potential to cause massive destruction to physical structures and equipment in addition to lethal effects against personnel. Nuclear weapons are a top concern for any military operation against actors possessing them.[2]

DELIVERY METHODS

WMD delivery methods vary widely depending on the type of agent/device, having historically included manned aircraft, cruise missiles, ballistic missiles, and artillery. Newer delivery platforms, including hypersonic missiles, remotely piloted aircraft, and small unmanned aircraft systems (sUAS), pose complex challenges due to their speed, stealth, and persistence. Additionally, covert dispersive techniques can include improvised explosive devices, aerial or ground sprayers, leaking containers, or other novel delivery mechanisms. Suboptimal munitions, delivery systems, and configurations also pose a significant threat of incidence.

Chemical. Chemical agent delivery systems include artillery shells, rockets, vehicle bombs, theater ballistic missiles, and small-scale improvised explosive dispersal devices. Aerosolized chemical agents can be sprayed from manned or unmanned aircraft, land vehicles, and ships.

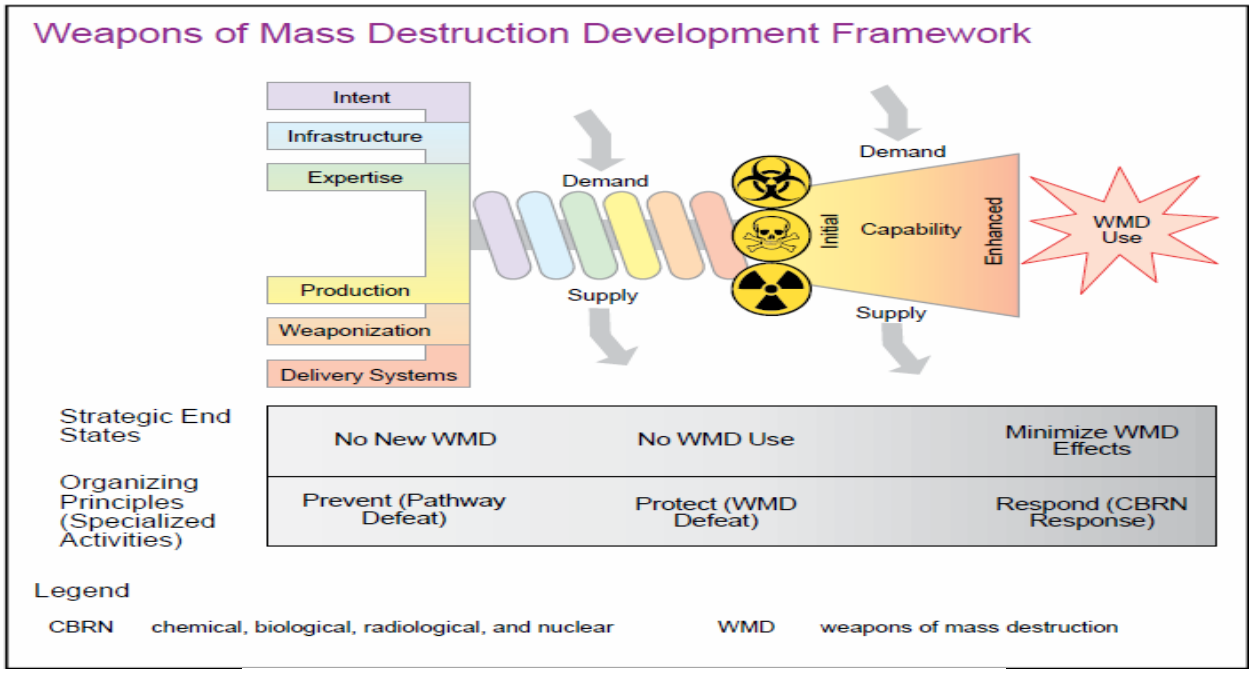
Biological. Biological agents can be spread using the same delivery means, or via fomite (an inanimate object contaminated with an infectious agent), vector (a live organism that carries and spreads a pathogen), or person-to-person contact. These agents may also contaminate food and water supplies, intentionally or inadvertently. Other innovative dispersal methods, such as targeted infection of public transportation systems, mandatory inoculation programs enacted under the guise of public emergency, or the use of unsolicited mail, could be used to accomplish mass transmission of biological agents.

Radiological. Radiological materials may be spread using dispersal devices or point sources, surface vehicles, or person-to-person contact. A radiological dispersal device (RDD), commonly referred to as a “dirty bomb,” combines radioactive substances with a dispersal mechanism (such as conventional explosive material) to spread radioactive material. RDDs may be deployed clandestinely or overtly and have the potential to contaminate wide geographical areas. A radiological exposure device (RED) is a point source of radioactive material used to covertly target a specific individual, or a small group of people confined to a small space.

[2] For additional information on the scale of damage from nuclear weapon use, see JP 3-11, *Operations in CBRN Environments.*

JOINT FORCE CWMD APPROACH

US Government (USG) efforts to counter WMD worldwide require a holistic approach that leverages all instruments of national power. Contributions from allies and partners, along with technological advancements conceived in the private sector, are also crucial to a successful Countering WMD (CWMD) strategy. The joint force should remain in lockstep with these organizations and, in some cases, lead them. The joint force operational framework built around the WMD Activity Continuum from JP 3-40 illustrates the WMD activity continuum, which is the sequence of events leading to WMD creation and use. This model also depicts, in parallel, the CWMD end states as *No new WMD*, *No WMD use*, and *Minimize WMD Effects.* The specialized activities that directly support these end states are *Pathway Defeat*, *WMD Defeat*, and *CBRN Response*.



WMD Activity Continuum (JP 3-40)

Pathway Defeat. WMD pathways are networks or links among individuals, groups, organizations, or governmental entities that encompass the critical components required for WMD acquisition. These components include ideas, materials, technologies, facilities, processes, products, and events. Pathway defeat operations seek to prevent or delay the acquisition, development, possession, or proliferation of WMD by employing measures designed to create layers of complex barriers that impose perpetual costs and setbacks.

WMD Defeat. After acquisition, WMD defeat efforts target the ability to assemble, stockpile, deliver, transfer, or employ WMD, and include deliberate actions to neutralize or destroy WMD devices or agents. Such efforts may also entail monitoring and dismantling WMD infrastructure.

CBRN Response. In the joint model, response includes actions taken to defend, respond to, and recover from WMD use should deterrence fail. The Joint Force Commander (JFC) postures, prepares forces, and mitigates CBRN effects to operate and win in any given

environment. The JFC may also be called upon to provide capabilities in support of joint response efforts by allies or partner nations, to provide defense support to US civil authorities, and to assist with forensic attribution.

CWMD ORGANIZATIONAL RELATIONSHIPS

Combatant Commanders (CCDRs) plan and execute CWMD missions within their Area of Responsibility (AOR). They develop CWMD strategy, policies, campaign, and contingency plans, and incorporate CWMD activities into their operational plans. The Commander, United States Special Operations Command (USSOCOM), serves as the Department of War (DoW) CWMD coordinating authority and, where appropriate, leads transregional CWMD campaign activities and plan development to counter emerging and existing threats and disrupt the development of WMD capabilities by our adversaries. Both conventional forces and Special Operations Forces (SOF) regularly contribute to CWMD efforts, either directly or indirectly.

JFCs conduct CWMD in a variety of combat and non-combat situations across the competition continuum. The joint force aims to curtail the development, possession, proliferation, use, and effects of WMD, as well as expertise, materials, technologies, and means of delivery. This is accomplished through specific tasks and activities to deter or prevent development and use; indirectly through *pathway defeat* efforts; and directly through *WMD defeat* operations.

CWMD operations target state and non-state actors, domestically and internationally, leveraging distinct Service capabilities and the seven joint functions (C2, information, intelligence, fires, movement and maneuver, protection, and sustainment). Commanders at all levels are responsible for conducting preparation activities, including training and equipping forces to defend, recover, and respond in a CBRN contaminated environment.

U.S. AIR FORCE CWMD OPERATIONAL FRAMEWORK

USAF capabilities support joint force CWMD activities and, accordingly, the DoW's strategic priorities. In coordination with the other Services, joint staff, combatant commands (CCMDs), and agencies, the USAF develops capabilities, provides forces, and executes operations required to **deter WMD use, assure allies and partners, prevent WMD proliferation, defend the homeland, and prevail in a CBRN environment.**

Strategic Priorities	**Deter WMD Use and Assure Allies and Partners** • Strategic Nuclear Deterrence • Multilateral Engagements • Arms Control Treaties and Agreements • Strategic Messaging	**Defend the Homeland and Prevent new WMD Threats** • Control (Divert, Intercept, Seize) • Defeat (Pathway & WMD Defeat) • Disable • Dispose	**Prevail in a CBRN Environment** • Safeguard the Force • Respond to the Threat • Recover Operational Capability
Foundational Activities	**1) Understand the Environment, Threats, and Vulnerabilities** **2) Cooperate with other Agencies, Allies, and Partners** **3) Maintain and Expand Technical Expertise**		

USAF CWMD Operational Framework

The *USAF CWMD Operational Framework* is designed to align with the Joint Force's operational approach. Three ongoing foundational activities are necessary for the realization of CWMD strategic priorities. Specific functions and activities, organized under each of the three strategic priorities, further depict how the USAF contributes to the CWMD strategy.

CHAPTER 2: CWMD STRATEGIC PRIORITIES

The current DoW policy for countering WMD prioritizes defending the homeland, preventing new WMD threats, deterring WMD use against the United States and allies, and enabling the joint force to prevail in a CBRN environment. These DoW priorities are reflected in the *USAF CWMD Operational Framework*.

These strategic priorities generally align with the competition continuum, although WMD use does not necessarily increase in proportion to global hostilities. Rogue states and VEOs are less likely to telegraph the use of WMD. Chemical and biological threats are of particular concern due to the convergence of multiple sciences and rapid technological developments.

DETER WMD USE AND ASSURE ALLIES AND PARTNERS

Deterrence of WMD use and assurance that allies and partners remain present in all phases of competition and conflict. Assurance is complementary to deterrence. Where the objective of deterrence is to influence an adversary's decision-making, assurance involves easing the fears and sensitivities of allies and partners. Both rely on a credible threat of nuclear capabilities, continuous multinational engagements, diplomatic international agreements, and deliberate strategic messaging. Joint doctrine underscores the importance of strategic deterrence to CWMD operations, defining “no new WMD” and “no WMD use” as CWMD end states.

NUCLEAR DETERRENCE ROLE IN CWMD

Comprising two of the three legs of the strategic triad, USAF nuclear capabilities support US strategic deterrence activities by presenting a credible threat of unacceptable counteraction, thereby ensuring the cost of an attack outweighs any potential gains. The fundamental purpose of the US nuclear arsenal is to deter adversaries from attacking the United States and its interests with nuclear weapons or other WMD. ICBMs and long-range bombers assure allies of America’s continuing commitment to their security, dissuade adversaries from embarking on WMD programs, and defeat threats when deterrence fails.[3]

- **Nuclear deterrence** serves as the backstop and foundation of US national defense, the defense of US allies and partners, and underwrites every US military operation. It includes nuclear weapons and delivery systems, nuclear command, control, and communications (NC3), and the people and infrastructure that support it. Should nuclear deterrence fail, the United States would consider the use of nuclear weapons to defend the vital interests of the nation, its allies, or partners.

- **Extended deterrence** is a commitment to deter and, if necessary, respond across the spectrum of potential nuclear and nonnuclear scenarios in defense of allies and partners. Extended deterrence is less about retaliation and more about posturing to convince an enemy they are unlikely to achieve their objectives via aggression.

[3] See AFDP 3-72, *Nuclear Operations*, for additional information.

CWMD-RELATED ENGAGEMENTS WITH PARTNER NATIONS

Air Force SC and BPC efforts include participation in exercises to improve combined capabilities, military interoperability, and CWMD self-sufficiency. Exercises with partner nations also increase common WMD threat awareness. For example, USAF intelligence and legal experts may participate in Proliferation Security Initiative (PSI) exercises. These engagements are designed to demonstrate a collective commitment to act against proliferation related shipments, send a strong message of deterrence to would be proliferators, enhance interdiction capabilities of PSI endorsing states, and extend outreach to non-endorsing nations observing the exercises. Similarly, the USAF contributes to interagency planning efforts for transport security exercises conducted in support of nuclear security summits.

ARMS CONTROL TREATY AND AGREEMENT MEASURES

The United States is party to several international treaties and agreements related to the reduction or elimination of WMD force structure, as well as the prohibition of use and proliferation of CBRN weapons and related materials. Certain treaties and agreements allow for inspection and verification of state capabilities, thereby aiding joint force and national efforts to locate, identify, characterize, and assess WMD and related materials. As an example, the Chemical Weapons Convention (CWC) may involve USAF participation in onsite inspections of nuclear weapons bases, storage and maintenance facilities, and conversion and test locations. Conversely, some treaties allow reciprocal inspection of USAF equipment and capabilities.[4]

Through alliances and treaties, extended deterrence provides what is often referred to as a nuclear umbrella to friendly and allied nations. The nuclear umbrella assures allies and partners of US commitment to their security and serves as a nonproliferation tool by obviating their need to develop and field their own nuclear arsenals. Other treaties that advance assurance and deterrence include:

- The *Treaty of Mutual Cooperation and Security Between Japan and the United States of America* specifies a commitment to defense cooperation, regular consultations, and peace and security in the Far East.[5]
- 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.[6]

[4] See Air Force Instruction (AFI) 16-601, *Implementation of, and Compliance with, International Arms Control and Nonproliferation Agreements*, for additional information.
[5] See the *Treaty of Mutual Cooperation and Security Between Japan and the United States of America,* for additional information.
[6] See the *Mutual Defense Treaty Between the United States and the Republic of Korea*, for additional information.

- 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 (NATO) partners.[7]

STRATEGIC MESSAGING

The USAF should synchronize communications with domestic and international partners to shape perceptions at the global, regional, and national levels regarding CWMD activities. Synchronized communication reassures allies and partners and underscores the costs and risks associated with CBRN acquisition and use to potential adversaries. Operationally, USAF CWMD-related communications should also align with JFC efforts to synchronize communication by reinforcing themes, messages, images, and actions to support the JFC's objectives.

Operations in the Information Environment. The purpose of Operations in the Information Environment (OIE) is to influence adversary and enemy decision-making to achieve outcomes favorable to the US and its partners. The USAF uses information-related capabilities (IRC) to create desired effects among relevant actors, including partner nations, neutral third parties, and adversaries. USAF information operations forces support efforts to deter adversary proliferation and use of WMD and to assure allies and partners of US resolve.[8]

Public Affairs. USAF PA can be leveraged to heighten domestic and international awareness about WMD threats, promote multilateral CWMD policies, deter adversaries by exposing their actions, and counter adversary propaganda. Likewise, PA information releases can assure at-risk allies and partners and support strategic messaging to deter adversary WMD. PA also provides essential capabilities needed to maintain public confidence in civilian and military response operations during homeland defense (HD) operations and defense support of civil authorities (DSCA).[9]

Show of Force Operations. Shows of force can be employed to shape both allied and adversary decision-making. 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.”[10] The USAF contributes to assurance through shows of force, such as deploying long-range bombers or dual-capable aircraft (DCA) to tense regions, which signal commitment to allies and demonstrate capability to adversaries.

DEFEND THE HOMELAND AND PREVENT NEW WMD THREATS

Defending the homeland from WMD and preventing new WMD threats is the second strategic priority in the *USAF CWMD Operational Framework*. The air component commander directs the execution of tasks associated with defending the homeland and defeating WMD threats by engaging those threats globally. This includes tasks necessary

[7] See the *North Atlantic Treaty*, for additional information.
[8] For additional information on applicable IRCs, see AFDP 3-13, *Information in Air Force Operations*.
[9] See AFDP 3-61, *Public Affairs*, for additional information.
[10] For additional information on shows of force, see JP 3-0, *Joint Campaigns and Operations*.

to locate, identify, characterize, assess, attribute, and predict CBRN-related proliferation and use in the operational area (OA).

WMD defeat operations are accomplished by **controlling, defeating, disabling,** or **disposing** (CD3) of CBRN materials and related program components and infrastructure. Defending the homeland also includes the USAF's role in domestic response to attacks or incidents involving CBRN material.

USAF support to joint force CD3 activities and tasks varies according to the nature of the threat and OE. Disable and dispose activities are normally the responsibility of the Joint Forces Land Component Commander, in cooperation with USG interagency and international partners. For such operations, USAF contributions are generally limited to operations support or specialized capabilities, such as those provided by SOF and the Air Force Radiation Assessment Team (AFRAT).[11] However, the USAF is often the primary provider for control and defeat activities.

WMD CONTROL ACTIVITIES

Controlling WMD threats involves JFC-directed operations and missions to divert, intercept, and seize WMD, related technology, materials, and means of delivery. WMD threats are reduced through isolation or denial of adversary access to CBRN-related materials and resources, including facilities and personnel. These activities include efforts to divert proliferated CBRN weapons, agents, and related material through direct military action or formal diplomatic channels. Such activities also include efforts to recover, intercept, seize, or otherwise secure CBRN-related material. Diversion and interception of WMD supports interdiction agreements with international partners (e.g., the Proliferation Security Initiative).[12]

- **Divert.** Efforts and resources to change the intended course or destination of shipments of WMD, related technologies, materials, expertise, and/or means of delivery, either willingly or by force.

- **Intercept.** Efforts to stop the movement or proliferation of CBRN materials, WMD components, means of delivery, functional weapons, or WMD-related personnel. Such operations may require boarding, search, and detection capabilities to secure and seize shipments.

- **Seize.** Offensive action to obtain control and possession of WMD capabilities (e.g., designated area, building, transport, materials, or personnel) that deny an actor's access to WMD capabilities. Typically, operations and missions to seize WMD capabilities will be the responsibility of either the land or maritime component commander.

[11] AFRAT is the DoW's primary worldwide response team for radiological incidents and accidents.
[12] Within this context, interdiction refers to operations that support civil (domestic and partner) agency enforcement of laws and treaties. Used in this manner, the terms intercept and interdict have similar meanings (not to be confused with Air Interdiction).

USAF ISR and air interdiction capabilities enable joint force efforts to divert and intercept proliferated WMD and related materials. USAF collection capabilities feed DoW and national intelligence collection on WMD and related targets. In turn, the national intelligence community's production of timely and actionable intelligence enables joint force and coalition military actions to divert and intercept illicit transfers of WMD and related materials.

Additionally, the air component commander may provide a range of air support to aid land and maritime component operations aimed at seizing adversary WMD and related program components (e.g., air mobility, counterland, countersea, and counterair). During combat operations in uncertain or non-permissive environments, counterland capabilities may be required to support land component seizure operations (e.g., WMD facilities) to defend friendly forces.[13]

WMD DEFEAT ACTIVITIES

WMD defeat activities cover the spectrum of offensive activity, from conventional to cyberspace and special operations, which address an adversary's development and use of WMD. As discussed in Chapter 1, defeat activities are categorized as **pathway defeat** and **WMD defeat.** The USAF maintains both kinetic and non-kinetic capabilities to deliver effects directly against adversary WMD targets.

Potential Targets. Pathway and WMD defeat operational objectives may become more difficult to achieve against adversaries with mature development programs or who have progressed to WMD employment. Identifying and striking these targets in the early stages of development and acquisition reduces an adversary's potential attack capability, provides commanders and partners with more options, and may result in fewer collateral effects. Hardened or deeply buried adversary WMD facilities and associated WMD program infrastructure may present targeting challenges. While destruction of the facility's contents may be impractical, an effects-based targeting approach may delay or disrupt the adversary's access to CBRN-related capabilities.

- **WMD Research and Development Facilities.** CWMD operations against R&D facilities rely heavily on accurate intelligence to detect and characterize CBRN materials and agents. Hazards may be concealed within medical and industrial complexes otherwise used for legitimate purposes (i.e., dual-use facilities). Attacks against research and development (R&D) facilities may temporarily delay or disrupt development, or could achieve a more permanent effect by destroying the facility.

- **Production Facilities.** Pathway or WMD defeat operations against production facilities provide another option for delaying, disrupting, destroying, or neutralizing an adversary's WMD capability. Depending on the maturity and sophistication of the adversary's development program, effects may only be temporary. However, strikes against production facilities represent a relatively low-risk option for reducing WMD threats.

[13] See AFDP 3-03, *Counterland Operations*, for more information.

- **CBRN Agent Storage Facilities.** Fixed storage facilities are particularly vulnerable to USAF WMD defeat operations. However, passive defense measures, such as hardened or deeply buried facilities, complicate the destruction or neutralization of WMD. Use of mobile storage facilities further complicates the destruction of CBRN weapons. Attacking storage facilities may also have collateral effects, releasing or dispersing CBRN materials such as chemical agents or radioactive substances. This should be carefully considered during planning. Effects-based solutions that focus on neutralizing a capability, rather than destroying CBRN agents, may achieve the same objectives.

Operation MIDNIGHT HAMMER

On 21 June 2025, the largest B-2 strike package in history took off from Whiteman AFB, MO loaded with GBU-57 Massive Ordnance Penetrator "bunker-busting" bombs. Of the thirteen B-2s that departed Whiteman, six flew west as an elaborate decoy while seven flew east towards Iran. The seven B-2s inbound to Iran were supported by a joint force of 112 aircraft that performed air-to-air refueling, electromagnetic attack and jamming, and offensive counterair operations that included suppression of enemy air defenses.

In the early morning of 22 June 2025, over two-dozen Tomahawk missiles struck the Isfahan nuclear site and multiple Iranian air defense locations. These strikes paved the way for seven B-2s to drop fourteen GBU-57s on Fordow and Natanz nuclear facilities. The post-attack damage assessments concluded the strikes severely damaged Iran's nuclear enrichment capacity, though it remains to be seen if the operation achieved its strategic objective of establishing long-term nuclear deterrence.

- **Fielded Weapon Systems and Supporting Infrastructure.** Strikes (kinetic or non-kinetic) against fielded CBRN weapons and supporting infrastructure seek to delay, disrupt, destroy, or neutralize an adversary's ability to promptly employ WMD,

either before adversary use or to limit damage from potential follow-on attacks. These targets are among the highest priorities and are potentially the greatest threats to the security of the US, its allies, and its partners. Once fielded, weapon systems such as mobile theater ballistic missile launchers present a significant challenge. Often difficult to detect before launch, such systems can react rapidly and launch with little or no warning. These targets also include transportation of WMD and WMD-equipped indirect fire (e.g., artillery) units.[14]

Risk Analysis. Due to their inherent strategic value, WMD will likely be well protected and fiercely defended. A partially successful or unsuccessful attempt to degrade WMD capabilities may provide rogue adversaries with justification to then employ those weapons. Additionally, conventional explosives may disperse chemical and biological agents rather than neutralize them, resulting in residual hazards for local civilian populations or advancing friendly forces. Standoff weapons, cyber operations, use of UAS, and specialized weapons that neutralize the CBRN materials and minimize dispersal are some risk mitigation techniques.

- **Legal Considerations.** WMD defeat operations are complex and may span multiple AORs, each with unique treaties, laws, and agreements. The staff judge advocates should be actively engaged during planning and execution phases. Depending on the threat scenario, pathway defeat or WMD defeat operations pursuant to anticipatory self-defense may be authorized. Anticipatory self-defense involves complex interpretations of international law. Given this complexity and sensitivity, orders to conduct pathway and WMD defeat operations likely will originate at the highest levels of the USG. The resulting ROE may be restrictive due to the inherently high operational risk and the potential collateral effects of these operations.

- **Multinational and Coalition Considerations.** Striking WMD-related targets may raise concerns among coalition members in a multinational operation. Coalition partners may operate under ROE different from that of the United States. In some cases, they could restrict or limit strike options for WMD and other sensitive CBRN-related targets. Planners and targeteers should coordinate with coalition partners to facilitate an understanding of possible concerns.[15]

Special Operations Forces. Air Force Special Operations Command (AFSOC) units regularly conduct operations and activities that contribute to WMD defeat efforts, either directly or indirectly. SOF are uniquely qualified to conduct core activities such as special reconnaissance, direct action, and counterterrorism operations that support small-scale CWMD efforts. Mission objectives may include operations into and out of contaminated battlespaces, where avoidance is not an option. The JFC may use SOF independently or integrated with conventional forces to perform CD3 operations. The Joint Special Operations Air Component Commander, as the air component commander to special operations, conducts operations that support these SOF core activities.

[14] See AFDP 3-03, *Counterland Operations*, for additional information.
[15] For additional information on legal considerations and targeting, see AFDP 3-60, *Targeting*.

SOF capabilities also include security and force protection, aircraft maintenance and generation, forward deployed ground refueling operations, and medical operations. AFSOC CE special capability teams provide CBRN protection and explosive ordnance disposal (EOD). AFSOC CBRN defense teams are equipped to provide CBRN defense for deployed personnel and assets for up to 30 days.[16]

WMD DISABLE AND DISPOSE ACTIVITIES

The USAF provides support for the disablement and disposal of WMD and related program components. Disabling and disposing activities are frequently conducted as part of broader USG or international efforts. Typically, such operations aim to roll back a state's WMD capability by eliminating its capacity to produce, store, and use CBRN materials. Air Force ISR, air mobility, and specialized WMD site exploitation capabilities may be used to support JFC-directed disable and dispose operations.

Project Sapphire

In 1994, more than a thousand containers of nuclear material sat in metal racks on the floor in a cold, dilapidated warehouse at the end of a railroad spur in Kazakhstan. The canisters were protected only by wooden doors with padlocks and barred windows that looked out at barren trees and a chain-link fence surrounding the area.

The all-but-forgotten materials were from Soviet Union nuclear submarine fuel abandoned after the nation's collapse. Through an accord, the United States acquired the materials from Kazakhstan to keep them out of the hands of terrorists. DOE's Y-12 National Security Complex (a manufacturing facility that is dedicated, in part, to reducing the global threat from WMD) got the call to secure the vulnerable materials, which included weapons-grade highly enriched uranium. After receiving confirmation of the types of materials present in Kazakhstan and details about their storage, a team of experts in uranium operations, health physics, criticality safety, industrial hygiene, security and nuclear packaging, began planning a material recovery mission. The secret mission (code name, Project Sapphire) was the first of its kind.

To complicate the situation, the airport was small and had no radar system. After many trips had been aborted because of bad weather, the C-5 planes finally arrived to retrieve the team and the materials. The weather, however, continued to be a problem. "The runway and the planes were iced over," the team leader said, "We were afraid we'd get stuck there all winter." After working since the beginning of October, the team finally made it home the day before Thanksgiving. Mission accomplished.

[16] See AFDP 3-05, *Special Operations*, for additional information.

CBRN Disposal. Specialized USAF capabilities may be tasked to assist with dismantling a WMD stockpile, such as those provided by EOD personnel. Likewise, AFRAT may be tasked to support the reduction and dismantling of radiological material stockpiles by providing on-scene health effects expertise, radiological monitoring, sampling, and dosimetry.[17] USAF airlift is often critical for moving forces and equipment into theater quickly to enable rapid site exploitation as part of activities to disable adversary WMD programs. In addition, airlift has proven essential in historical efforts to reduce and dismantle WMD and CBRN facilities and stockpiles.[18]

PREVAIL IN A CBRN ENVIRONMENT

The joint force depends on an air component able to not only survive a WMD attack but also maintain sufficient capacity to effectively generate airpower in the wake of an attack. The final strategic priority, *Prevail in a CBRN Environment,* goes beyond simply accomplishing mission essential tasks in mission-oriented protective posture (MOPP) gear. USAF planners should consider the cascading effects of WMD on USAF core functions at an operational level. Interdependent units of action should coordinate with one another and with C2 elements to account for degraded capability. Factors such as logistical delays resulting from airlift transload operations, a lack of reachback capability due to an EMP, and the need to conduct operations from an uncontrolled airfield due to split-MOPP conditions can severely degrade mission capacity if not addressed early and often. Prevailing in a CBRN environment requires Airmen to focus on three objectives: **1) safeguard the force, 2) respond to the threat, and 3) recover operational capability.**

> "Those nations who are caught unprepared for the coming war will find, when war breaks out, not only that it is too late for them to get ready for it, but that they cannot even get the drift of it."
>
> *–General Giulio Douhet*

SAFEGUARD THE FORCE

While distributed operations and agile combat employment (ACE) may increase survivability, they also increase environmental variables (e.g., weather, topography, population density) that should be considered. The nature of the CBRN threat will affect response methods and recovery capacity. For instance, medical countermeasures and restriction of movement strategies designed to contain a biological threat are unlikely to be useful against chemical or nuclear effects and may be too prohibitive to accomplish mission essential tasks. Likewise, MOPP may not provide the same protection against a chemical threat as against a radiological threat. Commanders rely on detailed planning and intelligence to implement CBRN defense measures appropriately matched to the threat, mission, force composition, surrounding environment, and resource availability. Conversely, subordinate leaders rely on clearly articulated commander's intent to adapt

[17] Dosimetry is the science by which radiation dose is determined through measurement, calculation, or a combination thereof.
[18] For additional information on airlift support, see AFDP 3-36, *Air Mobility Operations*.

actions to the fluid nature of CBRN events while maintaining unity of effort during distributed operations.

Integrated Air and Missile Defense. Integrated Air and Missile Defense (IAMD) is a critical element to counter airborne WMD threats. IAMD (which includes the functions of DCA and OCA) integrates capabilities and overlapping operations to defend the homeland by negating an adversary's ability to create adverse effects from their air and missile capabilities.

Golden Dome Concept

The Golden Dome initiative represents a critical modernization of homeland defense for the era of hypersonic and advanced missile threats. More than a single system, it encompasses a network of space-based sensors, interceptors, and command-and-control elements designed to detect and neutralize threats early in their flight path. This layered defense strategy, leveraging both existing and rapidly developed technologies, aims to close critical gaps in current homeland defense capabilities and deter adversaries by increasing the cost and complexity of potential attacks. The Golden Dome underscores the growing importance of protecting the homeland from 21st-century threats.

Identifying Vulnerabilities. Commanders and their staff should be aware of the most likely and most dangerous threats, the WMD characteristics, and vulnerabilities in infrastructure, equipment, and assigned or collocated forces to minimize the effects on US and partner nation assets. Obvious targets include military installations, headquarters facilities, logistical hubs, points of embarkation and debarkation, and critical infrastructure. However, as distributed operations become more commonplace, commanders should consider vulnerabilities stemming from increased logistical support missions, reduced security capacity, and the risk of further spreading contamination to other units (e.g., hubs and spokes) if not detected early. A well-rehearsed evacuation plan, effective warning system, continuity of operations plan (COOP)[19], and primary, alternate, contingency, and emergency (PACE) plan will reduce the vulnerability of C2 and communication systems. To allow sustained and effective use of airlift resources, planners may identify alternate aerial ports of embarkation and debarkation to protect and continue the time-phased force and deployment data (TPFDD) airflow and other resupply efforts.

Joint, Coalition, and Host Nation Considerations. Multilateral operations can increase the pool of valuable resources but may also introduce vulnerabilities. Commanders should prioritize understanding joint force and partner capabilities, requirements, and potential limitations before a WMD attack. HN support to CBRN response operations should be defined within support agreements, memoranda of understanding, or statements of work. Further, installation commanders are responsible for protecting non-military personnel in the event of a WMD attack and should account for this protection in response plans (e.g., installation EM plans, disease containment plans, medical

[19] For additional information on developing programs to ensure continuity of essential operations during an impending or actual national emergency, see AFI 10-208, *Continuity of Operations Program*.

contingency response plans) and training. Where contractors and HN personnel provide mission critical functions, commanders should plan and train for provision of CBRN defense measures that sustain these functions independent of these non-military personnel. USAF units of action may need to provide protection and defensive measures of an operating location organically. In doing so, they should coordinate and deconflict operational procedures and establish sufficient roles, responsibilities, and authorities (including appropriate risk acceptance) to defend against low altitude airborne threats such as sUAS, which may be a delivery method for WMD.[20]

CBRN Defense Systems and Measures. CBRN detection systems, computer-based warning systems, reporting tools, and various levels of personnel and equipment decontamination capabilities are necessary components for a unit of action to survive and operate in a contaminated environment. These measures should be applied in a layered and tailored approach to facilitate a comprehensive response. Air Force CBRN defense capabilities are drawn from Force Support, Medical, Force Protection, CE, Intelligence, and other functional communities, all of which synchronize and integrate to provide USAF commanders with the expertise and ability to mitigate CBRN effects and sustain mission essential combat readiness. When conducting distributed operations, defense measures may be initiated at the installation level. CBRN defense measures may be proactive or reactive, and include:

- Facility hardening.
- Materiel pre-positioning.
- Individual and unit protection measures.
- Individual CBRN training.
- Detection, identification, sampling, and quantification systems.
- Communication systems.
- Common operating picture displays.
- Health risk assessments.
- Medical surveillance.
- Medical countermeasures.

CBRN Detection. Air Force CBRN detection capabilities allow Airmen to identify, qualify, and quantify hazards. Each Airman is a key component of the sensing architecture. They should be trained to recognize and report indications of attacks involving CBRN agents, and to take the immediate actions necessary to protect themselves and mission resources. These are perishable skills and should not be relegated to “just in time” training before a deployment. Weather experts supply information on weather conditions and

[20] For more information on airfield defense, see AFTTP 3-2.31 *Air and Missile Defense*, and Air Force Doctrine Advisory, *Point Defense of Air Bases*.

other meteorological data. CE CBRN experts provide predictions about the type of agent, release point, and the plume (i.e., footprint of the contaminated area). Epidemiological investigative capabilities conducted by Public Health, Bioenvironmental Engineering, and medical personnel can also help detect biological weapons exposure, low-level chemical agent exposure (below current instrument detection levels), or radiation exposure. Point detection systems continue to improve rapid identification capabilities. Detection, sampling, and identification include:

- CBRN point and stand-off detection systems.
- Medical, food, and water surveillance.
- Post-attack reconnaissance (PAR) teams.

Disease and Casualty Prevention. Proper health, hygiene, and prophylaxis generally increase force survivability.[21] Commanders should optimize the appropriate level and type of protection based on current intelligence, the specific CBRN threat(s), the quantity of the agent dispersed, weather conditions, and the location of the actual or potential attack.

Survivability and Endurability of Mission Critical Systems. CBRN survivability is the characterization of a system's ability to avoid, withstand, or operate during and after exposure to a CBRN environment without losing the ability to accomplish the assigned mission. It is concerned with contamination that includes fallout and initial nuclear weapon effects, including blast, EMP, and other initial radiation and shockwave effects. Equipment is considered endurable if it can operate in a contested environment for an extended period despite loss of external logistics or infrastructure support.

- The three main principles of chemical, biological, and radiological contamination survivability of a system are hardness (the ability to withstand contamination, as well as any utilized decontaminates and decontamination methods), decontaminability (the ability to be cleaned swiftly and then be used safely by unprotected personnel), and compatibility (the ability to be operated and maintained by personnel wearing appropriate IPE).
- Nuclear, including EMP, survivability may be accomplished by hardening, timely resupply, redundancy, mitigation techniques (including operational techniques), or any combination of the above.

RESPOND TO THE THREAT

Responding to a CBRN threat includes those actions taken immediately following an attack, along with those taken when intelligence of an impending CBRN attack manifests. Depending on the level of conflict, location of the event, and characteristics of the threat, the response agencies and actions will vary. Following initial assessments, critical information that should be communicated to higher echelons includes:

[21] Prophylaxis is a medication or a treatment designed and used to prevent a disease from occurring.

- Immediate impact to unit's operational objectives.
- Ability to sustain operations at the affected installation for necessary duration.
- Manpower, expertise, and equipment requirements to accomplish recovery.
- Augmentation requirements to enable continued operations.
- Ability to transfer mission requirements or evacuate forces to another installation.
- Estimated time the affected installation can return to mission-capable status.

Contamination Avoidance. Total avoidance of contamination may or may not be the most suitable defensive technique depending on the threat, mission, and OE. Successful contamination avoidance includes force or asset dispersal, rerouting equipment and materials, and hardening facilities for personnel and critical equipment.

- Dispersal includes transporting mission-essential personnel and equipment from high-risk to low-risk areas for survival, recovery, and reconstitution.
- Relocation or rerouting of equipment and material may be necessary to survive and recover from an attack involving CBRN agents if contamination has a significant adverse impact on operations. Diverting aircraft to an uncontaminated airfield prevents the spread of contaminants to valuable airlift assets and cargo.
- Expedient hardening measures (e.g., sandbag walls or soil berms) are used to mitigate the destructive effects of weapons on aircraft and equipment. Mission-critical equipment that cannot be protected from blasts can be covered to minimize CBRN agent exposure.

Contamination Control. Contamination control includes reducing, removing, or rendering the hazard harmless. Decontamination operations, when feasible, can sustain operations by preventing or minimizing performance degradation, casualties, or loss of materiel. Decontamination requirements and methods will vary according to the nature of the contamination and the contaminated object. USAF planners should reference appropriate TTPs for decontamination procedures involving aircraft or equipment. Organizations such as AFRAT may provide dosimetry expertise or assist in developing decontamination procedures. The commander's staff, liaisons, and EM personnel should be aware of site decontamination capabilities. Bioenvironmental Engineers provide health risk and exposure assessments and manage radiation dose to personnel.

Remediation. Following attacks involving CBRN agents, commanders may undertake long-term remediation activities to return USAF equipment and facilities to attack preparation levels where possible. On-scene remediation efforts are designed to remove unexploded ordnance and reduce, remove, or neutralize contamination within affected areas. Though a primary operational objective is to enable personnel to operate within these areas without protective equipment, some residual CBRN agent hazards may remain.

Casualty Management. Casualty management involves tactical combat casualty care, patient identification, stabilization, medical treatment, rehabilitation, and, if necessary, victim transportation to a higher level of care. In addition to physiological ailments, victims may suffer from psychological disorders, including acute stress, panic, and post-traumatic stress disorder, the effects of which may not be apparent for many weeks after a WMD attack or incident.

Chaplains and Religious Affairs Airmen serving on religious support teams (RSTs) perform a critical role in casualty management. These individuals bolster force morale by providing spiritual care and ensuring free exercise of religion. RST members also advise commanders concerning morale, ethical, and moral issues. The trauma of CBRN events will likely intensify the need for spiritual counseling and religious support. Military chaplains are uniquely trained to operate in hostile, dangerous, and degraded military environments.

Commanders and their staff, including medical and services personnel, should also be prepared to care for contaminated casualties and human remains. In addition to other theater-wide challenges, overflight or landing restrictions imposed by other states could complicate medical evacuation and return of contaminated or deceased personnel.

Health Services. The Air Force Medical Service (AFMS) provides critical support in CWMD response operations. In addition to casualty management and treatment via fixed military medical treatment facilities (MTFs) and medical force elements, AFMS provides essential expertise in analyzing medical intelligence, medical surveillance, CBRN threat detection and identification, performing health risk assessments, vulnerability assessments, medical countermeasure use, restriction of movement, and patient decontamination.

- **Radiation Assessment.** The AFRAT provides manpower and equipment for rapid, global response to radiological/nuclear accidents and incidents. The AFRAT also provides subject matter experts to support planning, surveillance, analysis, and assessment to mitigate radiation health and operational risks resulting from radiological/nuclear events. Finally, the Expeditionary Medical Patient Decontamination Team removes, neutralizes, or reduces contamination from casualties before admission to MTFs.

- **Home Station Medical Response.** In-garrison medical forces mitigate the effects of CBRN incidents with preventive medicine, health/medical surveillance, radiological assessment, infectious disease identification, patient decontamination, and mental health services.

- **Bio-surveillance and Epidemiological Investigation.** Medical personnel within USAF Public Health, Bioenvironmental Engineering, and laboratories employ bio-surveillance capabilities to detect exposure to biological warfare, identify biological agents, and naturally occurring infectious diseases present within a surveilled area. Bio-surveillance is the process of gathering, integrating, interpreting, and communicating essential information related to all-hazards threats or disease activity affecting human, animal, or plant health to achieve early detection and

warning, contribute to overall situational awareness of the health aspects of an incident, and enable better decision-making at all levels.

Aeromedical Evacuation. The ability to move contaminated patients should only be used in extreme circumstances. Potential aircraft contamination, threats to aircrew safety, and limited availability of protective resources significantly restrict the ability to move a large number of patients, contaminated or otherwise. Rather, treatment-in-place using contaminated or contagious casualty management (CCM) capabilities is preferred. This is normally accomplished via deployed expeditionary medical force elements, medical CBRN teams, or can be done expeditiously using existing theater assets redeployed by the air component commander to assist with the management of contagious casualties.

- ✪ Evacuating potentially contaminated patients requires approval from the destination country, overflight privileges, and approval of any country where the aircraft will land for servicing. If transport is intertheater, approval from USTRANSCOM will be required as well. Close coordination between supporting and supported commanders, DoW, and DOS will be required for such movements.

RECOVER OPERATIONAL CAPABILITY

Recovering the ability to conduct operations begins after initial response activities. These efforts focus on restoration of essential equipment and services, force sustainment requirements, reestablishing a logistical framework, and other preparatory activities to enable units of action to resume combat or steady-state operations.

Command and Control of Air Operations. Episodic degradation of communication networks and C2 elements should be anticipated in any conflict likely to include WMD. Air component commanders need to address the continuity of C2 functions in a contested, degraded, and operationally limited (CDO-L) environment. Whether conditions-based or steady-state, clearly delegated authorities to commanders at the appropriate echelon will be critical for the air tasking cycle to continue. C2 functions and authorities may be disaggregated, delegated, or automated, but the primary elements of the theater air control system (TACS) will need to remain operational to execute a cohesive joint air operations plan. The inability to transmit an ATO should be mitigated with other guidance, ensuring that units of action understand which command echelon can prioritize interdependent functions such as air refueling, tactical C2, counter-UAS, and tactical mobility.

Restoration of Essential Services. The USAF is responsible for restoring essential services on its installations. Essential services include security, medical, housing, potable water, electrical power, telecommunications, other utilities, and a sustainable food supply.

Airlift in a CBRN Environment. While air mobility forces are trained and equipped to operate in a CBRN-contaminated environment, the limitations imposed on air mobility assets in such environments may significantly degrade the rate of force deployment. Until large-frame aircraft decontamination is technically feasible, contaminated aircraft should be segregated from the airlift flow. If operations into a contaminated airfield are deemed mission-critical and are specifically authorized, the air component commander should

establish a geographically separated transload site that can be used to transfer personnel and cargo between clean and contaminated aircraft. This transload process will likely delay TPFDD deliveries and may only be feasible for emergency or isolated cases. Additionally, retrograde of cargo from contaminated areas may be severely restricted. Until internationally recognized standards and legal requirements for acceptable decontamination levels are established, nations may deny transit and overflight rights to contaminated aircraft or cargo.

- **Commercial Aviation.** Commercial aviation plays an important role in the deployment, sustainment, and redeployment of Air Force forces. When fully activated, the Civil Reserve Air Fleet (CRAF) provides almost all the passenger-lift capability for Air Mobility Command (AMC) and a significant portion of its cargo airlift. However, civilian aircraft operating under DoW contracts or activated as part of the CRAF are not planned or intended to operate in areas where the threat level is greater than "low." Although commercial aircrews are issued ground crew chemical defense equipment for personal protection and trained to use it, they are neither trained nor equipped for flight operations in a contaminated environment. Upon warning of impending CBRN attack, every effort should be made to divert arriving commercial aircraft and launch those currently on the ground. Contaminated CRAF assets and civil aircraft under DoW contract should not be used, even if decontaminated to negligible levels. Currently, no decontamination standards exist for international flights. Enroute transload of cargo and passengers from civilian carriers to military aircraft or other transportation modes (e.g., sealift, rail, trucks) may be required, involving decontamination procedures. Generally, civil aircraft will not be used to transport equipment, or human remains with residual CBRN contamination due to safety and legal concerns.

Operations Support. Operations Support teams, such as Airfield Operations, Air Traffic Control, and the Aircrew Flight Equipment (AFE) Program, are trained and equipped to operate in a contaminated environment to enable the recovery of operational capability. AFE provides aircrew protection from the effects of CBRN weapons by managing aircrew CBRN equipment, preparing aircrew to operate in CBRN environments, and processing contaminated aircrew through the Aircrew Contamination Control Area (ACCA).

CHAPTER 3: CWMD FOUNDATIONAL ACTIVITIES

The *USAF CWMD Operational Framework* includes three foundational activities that span the competition continuum. These activities should be considered throughout the operational C2 process (planning, preparing, executing, and assessing). Commanders should understand how their actions influence or draw from these foundational activities from the perspective of the JFC, regardless of individual mission objectives.

UNDERSTAND THE ENVIRONMENT, THREATS, AND VULNERABILITIES

Understanding WMD threats in the operational environment (OE) is an iterative process integrated into planning, preparation, execution, and assessment. It involves collecting, processing, exploiting, and disseminating timely and actionable intelligence on adversaries and actors of concern, including possible proliferation or use of CBRN weapons and materials. This also includes characterization of CBRN threats post-conflict, as the joint force examines WMD facilities, stockpiles, weapons, and personnel.

Air Force planners need to understand the implications and requirements of CWMD-related tasks assigned to the service component by a CCDR as early as possible. While the commander's intent and objectives are manifested at the strategic level, they are planned, conducted, controlled, and sustained at the operational and tactical levels. Conventional missions with parallel CWMD objectives (e.g., destroying a WMD target) require specific CWMD considerations, which should be integrated into the broader joint force planning effort. To the Airman, CWMD operations are most easily visualized as kinetic operations that directly contribute to WMD defeat or pathway defeat objectives (e.g., Strategic Attack). However, significant planning should also take place to accomplish deterrence, defense, disposal, and other non-kinetic operations, often in coordination with other USG agencies, allies, and partners.

> "Commanders at every level need to be aware of the strategic implications associated with any WMD threat and adapt their CWMD planning efforts accordingly. CWMD activities and operations occur at all three levels of warfare—strategic, operational, and tactical—and any single action may have consequences at all levels. Nowhere is this more evident than in joint operations involving WMD, where action or inaction at the tactical level can have profound strategic repercussions."
>
> –JP 3-40, *Joint Countering Weapons of Mass Destruction*

WMD control, prevention, and non-proliferation initiatives are typically addressed in CCMD Campaign Plans (CCPs). In contrast, the coordinated response to potential or actual CBRN crises are more often addressed in contingency or operational plans. Regardless, USAF planners should consider and address WMD whether planning specifically for CWMD or for unrelated operations that may carry a CBRN threat.

Intelligence, Surveillance, and Reconnaissance. The air component commander leverages USAF Intelligence, Surveillance, and Reconnaissance (ISR) assets to characterize the OE, provide indications and warning, identify potential vulnerabilities, and find opportunities to achieve combat objectives.[22] Intelligence products enable the air component commander to implement appropriate defenses and direct operations to control, defeat, disable, or dispose of identified CBRN-related threats.

Identification and Attribution. To deter and respond to WMD threats, the air component commander should have resources available to quickly diagnose those threats and identify the actor behind them. Nuclear forensic capabilities enable the USG to attribute attacks to specific actors and justify responses. Prompt and effective chemical and biological hazard identification affords the air component commander tools to mitigate risk to forces and maintain the ability to fight in and through affected areas.

Hazard Modeling and Simulation. The air component commander relies on informed, accurate, and effective CBRN hazard modeling and simulation to assess threats and vulnerabilities, predict consequences of CBRN use, enable effective use of resources, and minimize collateral effects from strikes on CBRN weapons, materials, or related program components (e.g., production facilities). Though the USAF possesses some hazard modeling and simulation capabilities, it has also partnered with other organizations, such as the Defense Threat Reduction Agency (DTRA), to improve the quality of hazard models. Simulations and models also inform the development, implementation, and refinement of CWMD concepts of operation (CONOPS) to enable sustainment of operations in contaminated environments.[23] USAF Weather provides critical meteorological information, such as current and forecast weather projections, to support CBRN hazard modeling during mission analysis.[24] Similarly, USAF Civil Engineering (CE) offers crucial EM/CBRN expertise to support WMD hazard analysis and assessments, the establishment and operation of the CBRN threat detection grid, active CBRN response, and the development of CBRN contamination avoidance measures.[25]

Medical Estimates. Air component medical planners should provide a medical estimate of the identified CBRN threats in the OE and develop a supporting medical operational plan to address these threats. Medical planning considers intelligence on adversary WMD programs and adjusts plans as the threat evolves. USAF Medical Services leads medical planning for force health protection, support to medical facility operations, casualty management, and related CBRN medical activities.

COOPERATE WITH OTHER AGENCIES, ALLIES, AND PARTNERS

Security Cooperation. Security Cooperation (SC) is a broad category involving all DoW interactions to develop foreign defense security capabilities and defense relationships that promote US interests, enhance host nation (HN) capabilities and interoperability, and provide US forces with peacetime and contingency access to the HN. Air Force CWMD

[22] See AFDP 2-0, *Intelligence*, for additional information.
[23] For additional information on hazard modeling and simulations informing USAF CONOP and policy development, see DAFI 10-2602, *Countering WMD Enterprise*.
[24] See AFDP 3-59, *Weather Operations*, for additional information.
[25] See AFDP 3-34, *Engineer Operations*, for additional information.

SC activities are conducted with international partners, often in coordination with USG interagency organizations, and are intended to improve defense relationships and increase regional capability for collective WMD defense.

International CBRN Response. The USAF may provide assistance to an impacted nation in response to a deliberate or inadvertent CBRN incident. International CBRN Response (ICBRN-R) encompasses coordinated USG efforts to assist a partner nation responding to CBRN incidents.[26] Interagency organizations and partner nations may request USAF capabilities in ICBRN-R operations in coordination with and under the direction of the Department of State (DOS) and HN civilian authorities.

Cooperative Threat Reduction. The USAF contributes to cooperative threat reduction (CTR) efforts to dismantle and dispose of partner nation WMD stockpiles that may be vulnerable to theft or illicit proliferation. USAF contributions, in coordination with interagency and international partners such as DTRA, DOS, and the Department of Energy, often involve the transport of CBRN materials from unsecure locations in partner states to secure facilities within territories of the United States and its allies.[27]

Foreign Internal Defense. Most USAF Foreign Internal Defense (FID) actions entail working with and through foreign aviation forces to achieve US strategic and operational objectives. The USAF is well positioned to deliver FID support to partners for CWMD SC through security assistance programs, multinational aviation exercises, military-to-military exchange programs, and by providing trainers and advisors.[28]

Multinational Medical Support. USAF medical forces directly support CWMD defense through medical stability operations (MSO) and global health engagement (GHE), including aeromedical evacuation (AE) abilities.

MAINTAIN AND EXPAND TECHNICAL EXPERTISE

A sufficiently prepared force is foundational to CWMD operations. Expertise in functions such as CWMD-related planning, R&D, programming, exercise development, system integration, analysis, mission execution, and operational assessments requires long-term commitment to recruiting, developing, and retaining high-quality personnel. Individual capabilities are developed through proper education and training, ensuring Airmen are familiar with CWMD operations and can survive and operate in a CBRN environment. Donning individual protective equipment (IPE), recognizing and responding to alarms and warnings, and administering nerve agent antidotes are only some of the basic skills warfighters should maintain. Exercises at all levels should be designed to evaluate a unit's ability to execute mission essential tasks in a CBRN-contested environment.[29]

Functional and Specialized Communities. The objective for educating and training

[26] See, JP 3-41, *Chemical, Biological, Radiological, Nuclear Response*, for additional information.
[27] For additional information on airlift of contaminated materials, see the *Mobility Air Forces Counter-Weapons of Mass Destruction Concept of Operations*.
[28] See AFDP 3-22, *Foreign Internal Defense (FID)*, for additional information.
[29] For additional information on education, training, and exercise development, see DAFI 10-2503, *CBRN Defense Program*.

functional communities in CWMD operations is to ensure they have the knowledge, skills, and abilities (KSAs) required to contribute to the JFC's CWMD objectives. For instance, airfield operations personnel are trained in contamination avoidance for cargo transload operations, while Emergency Management (EM)/CBRN Specialists require more robust training in detection, decontamination, sheltering procedures, post-attack reconnaissance, and other CBRN defense operations. All Airmen require clear, realistic guidance from their respective functional area managers regarding expectations for mission essential task proficiency while operating in a CBRN contaminated environment.

Cross-functional Coordination. Most CWMD operations rely on the integration and expertise of multiple non-CWMD specific functional communities. The development and implementation of applicable doctrine, tactics, CONOPS, and concepts of employment provides the foundation for how the USAF integrates and synchronizes CWMD operations and missions across the Total Force.[30]

Conventional-Nuclear Integration. Conventional-Nuclear Integration (CNI) is the ability of the joint/combined force to recognize and survive the use of nuclear weapons, reconstitute critical capabilities, and plan and execute integrated, multi-domain conventional and nuclear combat operations in, around, and through a nuclear environment. CNI efforts are intended to remove long-standing barriers separating conventional and nuclear planning and operations, particularly regarding response to adversarial use of nuclear weapons. The *Air Force Capstone Concept for CNI* acknowledges that other nations view nuclear operations differently than the US. Readiness exercises have historically terminated with nuclear detonation, rather than continued with the objective of prevailing post-detonation. Doing so precludes in-depth evaluation of factors such as resilient C2, communications, logistics, supply chains, and base infrastructure. Because many operations will necessitate branch or sequel plans addressing nuclear weapons, experts should seek opportunities to discuss nuclear topics, operations, and effects with other planners as operational security allows.[31]

Joint and Multinational CWMD Exercises. In addition to educating and training personnel, total force preparedness is achieved through the execution of realistic and robust exercises. Peacetime activities with partners-particularly interagency and multinational training and planning exercises focused on building CWMD capabilities-enable the accomplishment of complex multinational CWMD operations.

[30] For additional information on cross-functional CWMD competencies, see DAFI 10-2602, *Countering WMD Enterprise.*
[31] For additional information on CNI, see the *2021 Air Force Capstone Concept for CNI*.

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