ANNEX 3-40 COUNTER WEAPONS OF MASS DESTRUCTION (WMD) OPERATIONS

UNDERSTANDING THE ENVIRONMENT, THREATS, AND VULNERABILITIES

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When tasked, the commander, Air Force forces (COMAFFOR) directs the execution of tasks to locate, identify, characterize, assess, attribute, and predict chemical, biological, radiological, and nuclear (CBRN)-related proliferation and use in the operating environment. The Air Force provides capabilities and executes missions in support of these tasks. As **Table 2** details, Air Force contributions include intelligence, surveillance, and reconnaissance (ISR); CBRN hazard modeling and simulation; installation-level detection and monitoring of CBRN-contamination for force protection and mission continuation; biosurveillance; epidemiological investigation; medical planning and logistics; and WMD-related treaty and agreement measures.

	CWMD Activity: Understand the Environment, Threats, and Vulnerabilities	Supported DoD Lines of Effort
Air Force CWMD-Related Operations, Missions, and Capabilities	Global Integrated Intelligence, Surveillance, and Reconnaissance (GIISR) • Plan and direct, collect, process and exploit, analyze and produce, disseminate intelligence • Battlespace characterization for indications and warnings of WMD proliferation and use • Collection operations to find, fix, track and characterize WMD and CBRN-related targets	• Prevent Acquisition • Contain and Reduce Threats • Respond to Crises
	CBRN hazard modeling and simulation to support predictive analysis (includes meteorological assessments)	• Respond to Crises • Contain and Reduce Threats
	Detect and monitor chemical, biological, and radiological contamination on/around airfields and air bases	• Prevent Acquisition • Respond to Crises
	Biological surveillance and epidemiological investigative capabilities to address biological threats	• Contain and Reduce Threats • Respond to Crises
	Medical planning and logistics predicated on adversary or actor of concern WMD program	• Prevent Acquisition • Contain and Reduce Threats
	Arms control treaty compliance monitoring, verification, and confidence building measures (e.g., overflight)	• Prevent Acquisition • Contain and Reduce Threats

Table 2: Air Force Contributions to the Understanding the Environment, Threats, and Vulnerabilities Joint CWMD Activity

ISR

Air Force globally integrated ISR capabilities are essential to COMAFFOR-directed efforts to locate, identify, and characterize adversary CBRN weapons and materials, program components, and proliferation pathways (e.g., materials, technologies, facilities, processes, products, and events). When combined with other department or agency intelligence efforts, Air Force ISR assets contribute to the provision of intelligence needed to find, fix, and track adversary CBRN-related capabilities.

The COMAFFOR leverages Air Force ISR, along with other intelligence sources, to characterize the operational environment in order "to provide indications and warning, identify potential vulnerabilities to our forces and identify opportunities to achieve our combat objectives."[1] Such characterization, in turn, enables the COMAFFOR to implement defenses to safeguard the force from the effects of potential CBRN attacks as well as direct operations to control, defeat, disable, and dispose of identified CBRN-related threats. Characterization of CBRN threats may also occur during and after a conflict when the joint force has the ability to examine WMD facilities, stockpiles, weapons, and/or personnel. While the COMAFFOR may be expected to support these efforts, targeted characterization of seized or secured elements conducted in uncertain or permissive environments will normally be the responsibility of the joint force land component commander and will involve specifically trained and designated forces. Air Force characterization of CBRN threats also contributes to COMAFFOR assessments, attribution activities, and analysis. For example, Air Force collection on CBRN targets may also support COMAFFOR, DOD, and national intelligence assessments used to understand US, allied, and partner "vulnerabilities in relation to a specific actor's WMD capability."[2]

Air Force ISR capabilities also support special operations and nuclear operations. (Refer to Annex 2-0, *Global Integrated Intelligence, Surveillance, and Reconnaissance Operations*, "ISR Special Relationships")

CBRN HAZARD MODELING AND SIMULATION

The COMAFFOR relies on CBRN hazard modeling to assess threats and vulnerabilities and to predict the possible consequences of CBRN use.[3] In so doing, modeling and simulation enables effective COMAFFOR employment of resources and supports efforts to minimize the collateral effects associated with strikes against CBRN weapons, materials, or related program components (e.g., production facilities). While the Air Force possesses the ability to conduct precision strikes against WMD and related targets, certain CBRN targets may be removed from strike lists due to potential collateral damage that may undermine national and/or strategic military objectives. Using input sources such as environmental data gathered from oceanographic and meteorological operations, intelligence on the CBRN target locations (e.g., structures, surfaces, quantity of agent), understanding of CBRN agent characteristics, and data on weapons effects, hazard modeling and simulation software generates estimates that characterize the threats associated with striking CBRN targets. These capabilities can predict the dispersal and persistence of CBRN agents in the operational environment

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[1] Annex 2-0, *Global Integrated Intelligence, Surveillance, and Reconnaissance Operations*, "Global Integrated ISR Enduring Capabilities."
[2] Joint Publication (JP) 3-40, *Countering Weapons of Mass Destruction*, pp. V-6.
[3] JP 3-40.

following a strike and extrapolate potential casualties both to the joint force and to noncombatants. The Air Force possesses some hazard modeling and simulation capabilities and has partnered with other organizations (e.g., the Defense Threat Reduction Agency) to develop capabilities needed to generate accurate models. The Air Force also utilizes CBRN hazard modeling to inform the development, implementation, and refinement of CBRN concepts of operation (CONOPS) that enable the sustainment of operations in CBRN-contaminated environments. In particular, chemical agent hazard modeling has proven instrumental in informing the underlying concepts and application of the *Air Force's Counter Chemical Warfare (C-CW) CONOPS*. Using hazard modeling in conjunction with operational analysis, the *C-CW CONOPS* provides a cross-functional, base-wide approach for minimizing and managing contamination to reduce mission-oriented protective posture levels as soon as it is safe to do so – the timing of which is a balance between force survivability and mission continuation in order to prosecute the war effort.[4]

In addition, meteorological and oceanographic assessments provide essential data to CBRN models. Weather experts supply information on weather conditions and other meteorological data. Emergency Management experts provide predictions about the type of agent, release point, and the plume (footprint of the contaminated area) (Reference Annex 3-59, *Weather Operations*).

(For more information on WMD hazard modeling and simulation, Reference Annex 3-60, *Targeting*, "Targeting Automation," subsection on "Capability Analysis Tools.")

CBRN CONTAMINATION DETECT AND MONITOR OPERATIONS

Detection of CBRN threats on and around airfields is of critical importance to Air Force operations when confronting CBRN-armed adversaries. While these installation-level monitoring capabilities support joint force hazard identification battlespace assessments, they are also essential to surviving and operating in CBRN-contaminated environments.

CBRN detection, sampling, and identification include CBRN point and stand-off detection systems; medical, food, and water surveillance; attack preparation and pre- and post-attack reconnaissance (PAR) and installation PAR teams. The samples collected for real-time identification provide evidence of a CBRN attack and may trigger response and/or protection operations. Point detection systems continue to improve and incorporate rapid identification capabilities. Epidemiological investigative capabilities conducted by public health and medical personnel can also contribute to detecting biological weapons exposure, low-level chemical agent exposure (below current instrument detection levels), or radiation exposure. Individual Airmen also serve as a key component of the detection architecture as a CBRN "sensor," reporting and identifying unusual events and/or symptoms.

[4] Air Force *Counter-Chemical Warfare CONOPS*.

BIOSURVEILLANCE AND EPIDEMIOLOGICAL INVESTIGATIVE CAPABILITIES

Biosurveillance describes the "process of active data-gathering with appropriate analysis and interpretation of biosphere data that might relate to disease activity and threats to human or animal health – whether infectious, toxic, metabolic, or otherwise, and regardless of intentional or natural origin – in order to achieve early warning of health threats, early detection of health events, and overall situational awareness of disease activity."[5] These capabilities assist in identifying the use of warfare agents and naturally occurring infectious disease outbreaks, while also supporting Air Force and joint force battlespace characterization and assessments.

Air Force public health and medical personnel provide the capabilities to detect biological warfare agent exposure that supports and feeds into joint force and national biosurveillance activities. Air Force public health and medical personnel also may conduct epidemiological investigations to determine if a biological event is the result of a deliberate use of biological warfare agents or naturally occurring infectious diseases. Epidemiological investigations involve examining a wide range of variables, including the number of casualties, morbidity and mortality rates, the likelihood of naturally occurring infection in specific geographic regions, antibiotic resistance, incubation times, multiple outbreaks in the operating environment, and unusual disease manifestation.[6]

(For more information on public health and medical personnel CWMD roles and responsibilities, see the "Support Operations, Health Services" DTM in this annex.)

MEDICAL PLANNING AND LOGISTICS

COMAFFOR medical planners should provide a medical estimate of the identified CBRN threats in the operational environment and develop a supporting medical operational plan to address these threats. Medical planning takes into account intelligence on adversary WMD programs and adjusts plans as the threat evolves. Air Force Medical Services lead medical planning for force health protection, support to medical facility operations, casualty management, and related CBRN medical activities.

(For more information on medical planning and logistics, refer to Annex 4-02, *Medical Operations*)

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[5] Homeland Security Presidential Direction – 21 and *The National Strategy for Biosurveillance*, July 2012.
[6] JP 3-40, *Countering Weapons of Mass Destruction.*