

CBRN Operations Force Modernization Strategy –A Pathway to the Future

化生放核(CBRN)作戰部隊現代化策略-未來的途徑

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As the Chemical Corps enters its second century of service in the U.S. Army, we must review our past and develop new concepts to guide our next century of service. Our past is replete with developing incremental improvements to core chemical, biological, radiological, and nuclear (CBRN) operations capabilities with little departure from established norms or practices. We address the CBRN threat as we have the last 100 years, through the capabilities of avoid, protect, and decontaminate. These three insular capability areas provide, in linear fashion, a focused reaction to an adversary action. Hazard avoidance focuses on the detection of existing hazards to identify CBRN “obstacles” and navigate the safe passage of forces. Protection, our most developed capability, leverages cumbersome, physical-barrier material to shield forces from a hazardous environment. Decontamination still requires water and pressure to remove contamination. While changes in military doctrine and technology have advanced to meet evolving threats, CBRN operations have remained virtually unchanged over the past 100 years. It is time for us to change how we view the threat.

隨著化學兵進入美國陸軍服務的第二個世紀，我們必須回顧過去並發展新概念，以導引我們下一個世紀的服務。在我們的過去充滿了逐步改進的核心化生放核(CBRN)作戰能力，幾乎沒有偏離既定的規範或方法。我們藉由迴避、防

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護和污染消除的能力解決過去 100 年來化生放核(CBRN)的威脅。這三個獨特的戰力領域，以直線方式提供對敵人行動的集中反應。危害迴避的重點是檢測存在的危害，以識別化生放核(CBRN)“障礙物”，並導航部隊的安全通道。防護是我們最發達的能力，它利用繁瑣的物理屏障材料屏蔽危險環境的部隊。污染消除依舊需要水和壓力來去除污染。雖然軍事準則和技術的變化已經發展足以應對不斷演變的威脅，但化生放核(CBRN)的作戰在過去的 100 年中，幾乎沒有變化。現在是我們改變對威脅看法的時候了。

As stated in the Chemical Corps mission statement, we exist to enable movement and maneuver to conduct large-scale, ground combat operations in a CBRN environment.² The desired end state consists of friendly forces retaining freedom of action in a CBRN environment. The capabilities currently provided by our Corps are not congruent with those required for movement and maneuver forces to be successful in their mission in a CBRN environment.

正如化學兵的任務宣言中所述，我們的存在是為了能夠在化生放核(CBRN)環境中進行大規模地面作戰行動的運動與機動。² 期望的最終狀態包括友軍在化生放核(CBRN)環境中保持行動自由。我們化學兵目前所提供的能力，與在化生放核(CBRN)環境中運動與機動部隊成功完成任務，所需的能力並不一致。

The latest edition of Field Manual (FM) 3-0, Operations, and the Army concept of multi-domain operations outline several new characteristics that are paramount to success against peer adversaries.³ We must understand how the Army intends to fight into the future and match the development of our core capabilities to ensure success in a CBRN environment. We must provide commanders with the ability to leverage the qualities of assess, protect, and mitigate to make proactive, risk-based decisions in a CBRN environment.

最新版的野戰手冊(FM) 3-0 “作戰”和陸軍多領域作戰概念，概述成功對抗對等敵人幾個至關重要的新特性。³ 我們必須了解陸軍打算如何應對未來，並配合我們核心能力的發展，以確保在化生放核(CBRN)環境中取得成功。我們必須讓指揮官能夠利用評估、防護和減輕的素養，在化生放核(CBRN)環境中做出積極且風險導向的決策。

As part of the Army's modernization efforts, the CBRN Operations Force Modernization Strategy, patterned after the Maneuver Force Modernization Strategy, provides the critical modernization path for our CBRN formations and capabilities in support of our primary customer – the brigade combat team – in the execution of decisive-action operations ultimately closing with and

2. U.S. Army Chemical, Biological, Radiological, and Nuclear School Web site, “Chemical Corps Mission,” <<https://home.army.mil/wood/index.php/units-tenants/USACBRNS>>, accessed on 7 November 2018.

3. FM 3-0, Operations, 6 October 2017.

defeating the enemies of our Nation on any battlefield in any environment.^{4, 5} This path meets near-term requirements and modernized CBRN operations capable of supporting brigade combat teams and echelons above brigade conducting combat operations in complex CBRN environments.

作為陸軍現代化工作的一部分，“化生放核(CBRN)作戰部隊現代化策略”是以“機動部隊現代化策略”為模式，為我們的化生放核(CBRN)編隊提供了關鍵的現代化路徑，與支援我們的主要客戶—旅戰鬥隊—執行決定性行動的作戰能力，最終在任何環境中的任何戰場上終結並擊敗我們國家的敵人。^{4, 5} 該路徑符合近程要求和現代化的化生放核(CBRN)作戰，能夠支援在複雜的化生放核(CBRN)環境中進行作戰行動的旅戰鬥隊和旅以上的梯隊。

Modernization Construct 現代化建設

The purpose of the force modernization strategy is to modernize CBRN operations capabilities. These capabilities will support the Army (and land component) to conduct cross-domain maneuver, fight semi-independently, and execute continuous cross-domain reconnaissance and security as part of the joint force. The core capabilities are enabled by CBRN reconnaissance, contamination mitigation, and the CBRN staff. These capabilities are linked together by our core functions – assess, protect, mitigate – across the spectrum of science and technology; concepts; and doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy (DOTMLPF-P).

部隊現代化策略的目的是使化生放核(CBRN)作戰能力現代化。這些能力將支援陸軍(和登陸組成部隊)進行跨域機動、半獨立戰鬥，與作為聯部隊的一部分執行連續的跨域偵察和警戒。核心能力藉由化生放核(CBRN)偵察、減輕污染與化生放核(CBRN)參謀得以實現。這些能力跨越科學和技術領域；構想；以及準則、組織、訓練、物料、領導教育、人員、設施和政策(DOTMLPF-P)，藉由我們的核心功能—評估、防護、減輕—聯繫在一起。

The CBRN Operations Force Modernization Strategy balances modernization and readiness, providing immediate improvements to near-term readiness and a bridge to long-term modernization across our core competencies and capabilities. Enabled by a new requirements determination process and existing programmatic procedures (the Army Requirements Oversight Counsel, the Army Requirements and Resourcing Board, the Joint Capabilities and Integration Development System), the CBRN Operations Force Modernization Strategy guides the Army Program Objective Memorandum (POM) and the Joint Chemical Biological Defense Program POM to expeditiously achieve evolutionary and revolutionary capabilities to close capability gaps and reduce risk for the joint force to operate successfully

4. CBRN Operations Force Modernization Strategy, July 2018.

5. Maneuver Force Modernization Strategy, January 2018.

in the complex CBRN environment of the future.⁶

“化生放核(CBRN)作戰部隊現代化策略”平衡了現代化和整備狀態，為近程整備狀態提供了即時改進，並為我們的核心競爭力和戰力提供了長程現代化的橋樑。經由新的需求確認流程和現有的程序化方法(“聯合戰力與整合開發系統”“陸軍需求與資源委員會”“陸軍需求監督諮詢”)，“化生放核(CBRN)作戰部隊現代化策略”指導“陸軍計畫目標備忘錄(POM)”和“聯合化學生物防禦計畫計畫目標備忘錄(POM)”能夠迅速達成進化和革命性戰力，以縮小戰力差距，降低聯合部隊在未來複雜的化生放核(CBRN)環境中成功作戰的風險。⁶

Future CBRN Operations Required Capabilities 未來化生放核(CBRN)作戰需求戰力

The use of weapons of mass destruction (WMD) is increasing, with no indication that the trend will change in the future. We have witnessed the suspected surgical employment of WMD in assassinations on two continents and in large scale to kill large populations. Current and future adversaries continue to develop and maintain formidable stockpiles of WMD. Countries are researching, developing, and pursuing nuclear capabilities of varying degrees. Non-state actors continue to pursue proliferation agendas, making the use of WMD a global challenge in many areas involving U.S. interests. We must prepare to operate in this complex environment while maintaining our freedom of action to achieve political, strategic, operational, and tactical objectives.

大規模殺傷性武器(WMD)的使用正在增加，沒有跡象顯示這種趨勢將來會發生變化。我們目睹了涉嫌精準使用大規模殺傷性武器在兩大洲進行暗殺與大規模殺害大量平民。當前和未來的敵人繼續發展和維持強大的大規模殺傷性武器(WMD)庫存。許多國家正在不同程度地研究、開發和追求核戰力。非國家行為者繼續追求擴散的實際行為，在包含美國利益的許多地區造成使用大規模殺傷性武器(WMD)的全球挑戰。我們必須準備在這種複雜的環境中作戰，同時保持我們的行動自由，以達成政治、戰略、作戰和戰術目標。

To achieve freedom of action, increase lethality, and enable movement and maneuver in the execution of large-scale, ground combat operations in the complex CBRN environment, the following future CBRN operations capabilities are required:

為了在複雜的化生放核(CBRN)環境中實現行動自由、增加殺傷力，並實現大規模地面作戰行動的運動與機動，需要以下未來的化生放核(CBRN)作戰能力：

- **Real-time understanding.** As early as possible, create a functionally integrated framework that enables commanders to achieve the level of understanding required to make informed, risk-based decisions to protect

the force while retaining freedom of action in a CBRN environment. The force requires—

- **實時理解。**儘可能及早建立一個功能整合的架構，使指揮官能夠達到所需的理解程度，以便在保留部隊防護力的同時，做出明智的、風險導向的決策，同時保留化生放核(CBRN)環境中的行動自由。部隊需—
 - Expanded access to all sources of information and the integration of CBRN information requirements into a commander's intelligence, surveillance, and reconnaissance collection plan.
 - 擴大對所有資訊來源的處理，並將化生放核(CBRN)資訊需求整合到指揮官的情報、監視和偵察蒐集計畫中。
 - A CBRN-centric sensing and detection capability integrated with all source information receptors and collectors.
 - 以化生放核(CBRN)為中心的感測和檢測功能，與所有資訊來源的接收器和收集器整合。
 - The capability to assess and analyze information from intelligence, surveillance, and reconnaissance sources to establish knowledge of CBRN threats and hazards in the operating environment.
 - 能夠評估和分析來自情報、監視和偵察來源的資訊，以便在操作環境中建立化生放核(CBRN)威脅和危害的知識。
 - Machine learning and artificial-intelligence tools to help commanders and staffs determine the behavior threat patterns and operations that typically precede CBRN use.
 - 機器學習和人工智能工具可幫助指揮官和參謀確定通常在使用化生放核(CBRN)之前的行為威脅模式和作戰。
 - The capability and capacity to analyze and integrate decision support products into the commander's decision cycle to provide a risk-based, real-time understanding of a complex CBRN environment.
 - 分析與整合決策支援成果到指揮官的決策週期中的能力和潛力，以在複雜的化生放核(CBRN)環境提供風險導向的實時理解。
 - The capability and capacity to exploit information to create windows of opportunity and advantages against adversaries.
 - 利用資訊創建對抗敵人機會窗口與優勢的能力和潛力。
- **Inherent survivability.** Individually and collectively enable with integrated protection. The force conducts large-scale, ground combat operations without degradation in a CBRN environment. The force requires—
- **固有的生存能力。**使個人和集體能夠整合式防護。部隊在化生放核(CBRN)環境中進行大規模的地面作戰行動而不會減降。部隊需—
 - Integrated personal protective equipment and physiological monitoring to protect from CBRN threats and hazards without physical degradation or loss of combat effectiveness.

- 整合個人防護設備和生理監測，以防止化生放核(CBRN)威脅和危害，而不會造成身體功能減降或戰鬥力喪失。
 - Adaptive collective protection that allows mission command and medical activities to sustain operations without individual personal protective equipment in a CBRN environment.
 - 適宜的集體防護，以便允許任務指揮和醫療活動在化生放核(CBRN)環境中沒有個人防護設備的情況下維持運作。
 - Vaccines to protect the force from known chemical and biological hazards to reduce reliance on individual protective equipment and collective protection.
 - 疫苗可以保護部隊免受已知的化學和生物危害，從而減少對個人防護設備和集體防護的依賴。
 - Flexible and adaptable protection options against biological agents, leveraging an understanding of the operating environment and atmospheric conditions.
 - 理解作戰環境和大氣條件的影響，以選擇靈活且適應性強的生物毒劑防護。
- **Negation of hazard effects.** Provide commanders the flexibility to make risk-informed decisions on the mitigation of residual CBRN contamination without reduction of combat power or unnecessary expenditure of time and resources. The force requires—
- **拒絕危害影響。** 為指揮官提供執行風險告知決策的靈活性，以便在不降低戰鬥力或不必要的時間和資源支出的情況下，減少殘留的化生放核(CBRN)污染。
- 部隊需—
- Organic/crew level mitigation capabilities that allow first-line leaders to assess and mitigate contamination at the lowest level, focusing on reducing risk to their squads and crews without reliance on CBRN enablers.
 - 組織/組員級降解能力，允許第一線領導者處理和減輕最低層級的污染，著重於降低他們小隊和組員的風險，而不依賴於化生放核(CBRN)專責人員。
 - Automated and waterless mitigation capabilities to reduce the logistical burden and increase the responsiveness of CBRN enablers.
 - 自動化和無水降解能力，以減少後勤負擔，並提高化生放核(CBRN)專責人員的回應能力。
 - Forward diagnostic capabilities coupled with therapies to reduce reliance on specialized medical enablers and to maintain forward combat power.
 - 與治療相結合的先頭部隊診斷能力，以減少對專業醫療人員的依賴，並維持先頭部隊戰鬥力。

These capabilities and the learning associated with their employment serve as pathways for the modernization of CBRN operations capabilities and

achievement of freedom of action in a CBRN environment. These capabilities must be applicable across the range of military operations, against adversaries, and in all environments. While the goal is to prevent the force from operating among CBRN hazards through a robust understanding of the CBRN environment, we must be prepared to operate in a CBRN environment and exploit future adversary use of WMD.

這些戰力以及與其職能相關的學習，可作為化生放核(CBRN)作戰能力現代化和達成於化生放核(CBRN)環境中行動自由的途徑。這些戰力必須適用於對抗敵人的各種軍事行動與所有環境。雖然其目的是藉由深刻理解化生放核(CBRN)環境，以預防部隊在化生放核(CBRN)危害中作戰，但我們必須準備在化生放核(CBRN)環境中作戰，並制止未來敵人使用大規模殺傷性武器(WMD)。

Conclusion 結論

The mission of the Chemical Corps now and in the future will be to enable movement and maneuver in the execution of large-scale, ground combat operations in a CBRN environment. Across our three core functions of assess, protect, and mitigate, we will generate near-real-time understanding of the CBRN environment, provide integral protection at individual and collective levels, and negate CBRN hazard effects, thus facilitating assessment, protection, and mitigation of CBRN hazards at a distance and in stride with no degradation to operations. The desired end state is retaining freedom of action through movement and maneuver in the complex CBRN environment.

化學兵現在和將來的任務將是在化生放核(CBRN)環境中進行大規模地面作戰行動能夠運動與機動。在評估、防護和減輕的三個核心功能中，我們將近乎實時地理解化生放核(CBRN)環境，在個人和集體層級提供整合防護，與拒絕化生放核(CBRN)危害影響，從而有助於遠距離和大幅度的評估、防護和減輕化生放核(CBRN)危害，且不會降低作戰行動。藉由複雜化生放核(CBRN)環境中的運動與機動，期望在最終狀態仍維持戰鬥的自由度。

To achieve this end state, we must provide near-real-time understanding of the CBRN environment. We must also expand our sources of information beyond traditional means. CBRN-centric sensing and detection capability must be integrated with all-source information receptors and collectors to conduct holistic assessments of available information and to develop trends. Achieving near-real-time understanding of the CBRN environment may not negate the requirement to operate in a known CBRN hazard; thus, integral protection from the individual to collective level is paramount to mission success. The force must be able to freely operate in a CBRN environment rather than avoid it. This allows the force to exploit opportunities currently considered vulnerabilities. And as a consequence of operating in a CBRN environment, residual contamination must be mitigated effectively, efficiently, and expeditiously.

為了實現這種最終狀態，我們必須提供對化生放核(CBRN)環境近乎實時的

理解。我們還必須擴大我們的資訊來源，並超越傳統手段。必須將以化生放核(CBRN)為中心的感測和檢測能力，與所有來源資訊接收者和收集者相整合，對現有資訊進行整體與發展趨勢評估。實現對化生放核(CBRN)環境的近乎實時的理解可能，不會否定在已知化生放核(CBRN)危險中作戰的要求；因此，從個人到集體層級的整合防護對於任務的成功至關重要。部隊必須能夠在化生放核(CBRN)環境中自由地作戰，而不是迴避它。這允許部隊對目前認為的弱點進行對抗的機會。因此在化生放核(CBRN)環境中作戰，必須有效、高效和迅速地減少殘留的污染。

Fundamental to accomplishing our modernization strategy is a vigilant focus on what we are for and who we support—enabling movement and maneuver in the execution of large-scale, ground combat operations in the complex CBRN environment to 2028 and beyond. The strategy provides vision and direction for modernizing CBRN operations and countering WMD capabilities to meet the requirements for movement and maneuver formations executing large-scale, ground combat operations. The strategy will be continuously assessed and adjusted to meet the demands imposed by changes in funding, the operational environment, and senior-leader priorities. In doing so, the strategy maintains relevancy and serves as a useful guide for future senior-leader decisions.

實現我們的現代化策略的基礎是警惕地關注我們的目標和支援者——在複雜的化生放核(CBRN)環境中實施大規模地面作戰行動的運動與機動，直到 2028 年甚至更久。該策略為化生放核(CBRN)作戰現代化和對抗大規模殺傷性武器(WMD)能力提供了願景和方向，以滿足執行大規模地面作戰行動的運動與機動編隊要求。該策略將不斷進行評估和調整，以滿足資金變化、作戰環境和高層領導優先事項所強加的需求。透過這樣做，該策略保持了相關性，並為未來的高層領導決策提供了有用的指導。