

Operating In Contaminated Environments: Observations From NTC 化生放核污染環境中作戰-國家訓練中心的觀察(譯)

From: Army Chemical Review (ACR), 2020

出處：美國陸軍化學兵年刊，2020

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Imagine that on your drive into work one morning, you are involved in a vehicular accident and you find yourself with internal bleeding and multiple broken bones. Moments later, you are collected by ambulance and transported to a newly completed multimillion-dollar hospital filled with the best medical equipment that money can buy—however, a lack of skilled doctors, surgeons, and nurses with years of education and experience makes the ridiculously expensive building a high-dollar first aid kit. Unfortunately for you, surgery to correct internal bleeding requires a trained surgeon with skilled hands and, preferably, vast experience. This is analogous to problems encountered when Soldiers lack necessary training.

想像一下有天早上在開車去上班途中碰上車禍，發現自己內出血及多處骨折，接著被救護車送往一間造價不斐、擁有最好醫療設備的醫院，然而迎接的卻是缺乏訓練及經驗的醫生及護士。不巧的是，內出血的處置往往仰賴嚴謹的訓練及豐富的經驗。這情況就如同我們的士兵在缺乏訓練時所遇到的問題。

Soldiers from every military occupational specialty (MOS) must remain physically strong, qualify on an assigned weapon system, know how to operate a radio, be capable of surviving in a contaminated environment, and be able to render first aid. But are we adequately trained to execute our individual mission requirements in a chemical, biological, radiological, and nuclear (CBRN) environment? Command Sergeant Major Jose J. Santiago, who has 23 years of military experience and currently serves with the 2d Battalion, 37th Armor Regiment, 1st Armored Brigade Combat Team, 1st

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Armored Division, Fort Bliss, Texas, explains a reoccurring problem, stating, "The Army and our young Soldiers do not know how to do the basic of things and are failing."

各軍職專長的士兵們都必須維持良好的體魄、具有操作武器系統的能力、瞭解如何使用無線電、能在污染環境中生存並提供急救。但對於在化生放核環境下執行各項任務，我們是否已有充分的訓練？擁有 23 年軍旅經驗、目前在德州布利斯堡第一裝甲師聯兵一旅三七裝甲團二連服役的一等士官長 Jose J. Santiago 提出了一個常見的問題：「陸軍和年輕的士兵們都不知道，也不會這些基本功夫。」

In basic combat training, every Soldier learns that when involved in a CBRN attack, the protective mask, which is worn on the side of the hip, will help save the Soldier's life if properly donned and sealed on the Soldier's face within 9 seconds. The purpose of CBRN training is for every Soldier in every MOS to recognize the threat, quickly respond, and maintain operations in a contaminated environment. However, new recruits in basic combat training wear the bulky, hot chemical suits and masks only once or, maybe, twice during the initial CBRN training, which consists of approximately 15 minutes of actual training time. Basic combat training and periodic familiarization training alone do not adequately prepare Soldiers with the ability to fight in a CBRN environment for the remainder of their careers. Furthermore, the impact of inadequate CBRN training throughout a Soldier's career can be fatal. Despite the importance of the training, it is clear that our Soldiers are not prepared to fight in a contaminated environment; the training staff at the National Training Center (NTC), Fort Irwin, California, has identified four common observations to help aid in Soldier survivability and preserve combat power in a contaminated environment

在新兵訓練時，每個士兵都知道在遭遇化生放核攻擊下，在 9 秒內正確地戴上防護面具，將可保住他們的性命。化生放核訓練旨在使各軍職專長的士兵們學習辨識威脅、快速反應及維持污染環境中的作戰能力。然而這些新兵在化生放核基礎訓練時，卻只穿了一至兩次全裝防護服及面具，以及僅有大約 15 分鐘的訓練時間。單靠新兵訓練及定期複訓，並不足以使士兵們在化生放核環境下做好萬全的準備。此外，缺乏化生放核訓練也攸關著士兵們的生命安全。儘管明白訓練的重要性，但顯然我們的士兵並沒有做好在污染環境中的作戰準備。為了提高士兵們在污染環境中的作戰與生存能力，美國加州歐文堡國家訓練中心的訓練官提出了四個常見的問題。

First, NTC staff observed a failure to conduct preventive maintenance checks and services to ensure that equipment was up-to-date and mission-ready. For example, CBRN detection equipment (such as the Joint Chemical Agent Detector) might not power on due to corroded batteries or

unreplenished consumable parts (such as sieve filter packs). Or, after a CBRN attack, M-26 decontamination sprayers might not produce the hot water required to clean/decontaminate vehicles due to missing basic-issue items. Or, with the sound of incoming enemy rounds possibly filled with chemical agents, Soldiers might pull out protective masks that have no filters attached or are missing other lifesaving parts; they must then spend additional time to correctly assemble the mask before taking their next breath. Furthermore, the protective mask must be regularly maintained, fitted, and tested—and parts must be replaced, when necessary. Units successfully training for the CBRN fight admit that they schedule regular-interval inspections of consumable Army equipment such as protective mask filters or Joint Service Lightweight Integrated Suit Technology items for the need for repair, wear-out dates, and equipment shelf life expiration dates.

首先，國家訓練中心訓練官觀察到未落實先期保養與檢查，以確保裝備狀態是否符合任務所需。舉例來說，化生放核偵檢裝備(如多功能化學戰劑偵檢器)可能因為電池鏽蝕或未更換耗材(如過濾網)而無法正常開機；或是在遭遇化生放核攻擊後，M-26 消毒器可能因為缺少基本料件而無法提供車輛清除或消除所需的熱水；或在遭遇敵化學戰劑威脅時，士兵們可能戴上沒有濾毒罐或缺少其他重要元件的防毒面具，使他們得花額外的時間安裝，以維持正常的呼吸。此外，防護面具必須定期保養、穿戴、測試及更換必要耗材。具有充分化生放核訓練的單位指出，他們會針對陸軍消耗性裝備，如防護面具的濾毒罐、聯合軍種輕型綜合防護服技術²的相關裝備做定期檢查，以滿足維護、損耗狀況及使用期限的評估需求。

Next, NTC staff observed a problem with matching compatible equipment. For example, drink tube adapters for the M-50 protective mask do not automatically fit the many brands of hydration systems worn on the Soldier's back or the lid of the standard canteen supplied by the central-issue facility. Soldiers must protect themselves from chemical and biological contamination using the assigned protective mask and must be able to drink from a canteen after having donned the protective mask. Soldiers reacting to a CBRN training attack often do not have the necessary adapter—or the adapter is packed in the bottom of a rucksack, still in the original plastic packaging, because they are unaware of the purpose of the item. Soldiers working in the summer heat at NTC are degraded just as quickly as they are when working in Mission-Oriented Protective Posture (MOPP) Level 4 in a real-world CBRN attack. Environmental injury can be avoided, but only if Soldiers use working equipment and understand how to properly utilize all the equipment issued.

2. 聯合軍種輕型綜合防護服技術 (Joint Service Lightweight Integrated Suit Technology, JSLIST)，即應用於美國海軍的高級防護裝具(Advanced Chemical Protective Garment, ACPG)，為美軍用於防護化生放核危害的裝具，包含防護服、防護靴、防護手套及空氣呼吸器。

接著，國家訓練中心訓練官發現裝備相容性的問題。舉例來說，M-50 防護面具上水壺管接頭的規格，與大部分士兵們所背負的水袋及公發制式水壺並不相容。訓練上除了必須在化學及生物污染環境中戴上防毒面具外，同時也要能符合飲水需求。在化生放核訓練時，士兵們通常缺少這個重要的轉接頭，或將轉接頭放在背包底部，甚至還未拆封，這些都代表他們不瞭解這項裝備的用途。在國家訓練中心的炙熱訓練中，士兵們在最高防護等級著裝下的降能程度，可比擬實際遭受化生放核的威脅攻擊。惟有使士兵瞭解裝備用途及透過實際操作，才能避免環境因素造成的傷害。

NTC staff also observed Soldiers incorrectly possessing, wearing, and using equipment. Soldiers receive a protective mask, a booklet of M8 chemical agent detector paper (to detect chemical agents present in liquid form), a dispenser of M9 chemical agent detector paper (to detect liquid nerve and blister chemical agents), and an M256A1 chemical agent detector kit from the assigned unit. The Army expects Soldiers to train on this simple detection equipment to ensure that the environment is safe before dressing down from higher MOPP levels. Many times, Soldiers in MOPP Level 4 have no training associated with the proper care and use of equipment and no actual equipment to detect the presence of a contaminant. Basically, they find themselves trapped in the sun for hours or unmasking in the contaminated environment, resulting in an unnecessary loss of combat power. Soldiers of every MOS and rank need multiple repetitions of training in the correct use of equipment in order to remain proficient in basic survival tasks and to ensure that they can continue to accomplish their mission. Proper training is vitally important because the donning of protective equipment makes performing the most trivial tasks awkward and frustrating due to limited dexterity, blurry vision, and restriction of movement

國家訓練中心也觀察到士兵們未能正確攜帶、穿著及使用裝備。他們有一個防護面具、一本 M8 化學戰劑偵檢紙(檢測液態化學戰劑)、一本 M9 化學戰劑偵檢紙(檢測液態神經與糜爛戰劑)及一個 M256A1 化學戰劑偵檢包。陸軍希望能透過這些簡單偵檢裝備，在降低防護等級前能先確保環境的安全。許多時候，這些穿著最高防護等級的士兵們由於沒有學過如何正確地保養與操作相關設備，使自己在陽光下多待了幾小時或在污染環境中未配戴防護面具，導致不必要的體能消耗。各軍職專長與階級的士兵們，都需要經過多次且反覆的訓練，才能確保他們的生存與任務遂行。在穿戴防護裝具執行任務時，行動會顯得有些笨拙、缺乏靈活性、阻礙視線及行動能力上的限制，因此適當的培訓則顯得至關重要。

Finally, NTC staff observed issues with reporting. Most Soldiers and small units have trouble with warning others in immediate and adjacent areas

about a threat due to the chaos of the situation or a lack of education about operational requirements. For units in surrounding areas, the Army uses the CBRN Warning System, whereby specific reports (Reports 1 through 6) are used to inform nearby units to avoid contaminated areas, allowing them to continue fighting the enemy “clean” (with no contaminants)—not “dirty” (with contaminants).

最後，國家訓練中心人員觀察到狀況回報的問題。由於場面混亂或缺乏作戰的訓練要求，大多數士兵們及少部分單位無法及時向鄰近友軍單位回報狀況。對此，可透過陸軍的化生放核警報與報告系統（一號至六號報告）通知鄰近友軍單位迴避污染區，確保作戰時不受化生放核污染。

During a CBRN strike, rotational training units develop a compounded delay in actions and decisions due to their inability to survive the observed deficiencies; consequently, they lose momentum to continue the fight against the enemy. In the Army, ignoring the basics causes Soldiers to fail, ultimately causing the unit to fail. In the business world, success is measured in productivity and the bottom dollar; according to an article on the SH!FT Disruptive eLearning Web site, “If you believe that training is expensive, it is because you do not know what ignorance costs.”

在下達化生放核攻擊想定時，輪訓單位因無法有效處理而失去與敵人的作戰能力。在陸軍，忽略這些基本功往往都會造成人員損傷，最終導致單位任務無法遂行。在商業，生產力與資本決定了成功與否；一篇在 SH!FT 網站上的文章提到：「如果你認為訓練的成本太高，那是因為你不瞭解無知的代價。」³

NTC is currently training for an anticipated major-nation near-peer threat with a weapon of mass destruction capability and the ability to fight in a CBRN environment. Units that successfully continue their mission in a CBRN-contaminated environment during an NTC rotation attribute their success to quality home station multi requirement training on all CBRN tasks, performed with supervision, verification, and validation. The units train these CBRN tasks while conducting other training requirements, such as monthly communication exercises. Protecting oneself in a CBRN environment is not about wearing uncomfortable gear; it is about surviving in a contaminated environment while properly completing the assigned mission. Combined training events allow Soldiers to practice basic survivability skills while also performing essential mission tasks. They also allow leaders to verify that their formations are honestly ready to engage an enemy with the capability to detonate weapons of mass destruction.

國家訓練中心目前針對受大規模毀滅性武器威脅的國家，訓練其化生放核環境下的作戰能力。在國家訓練中心基地輪訓期間，能在化生放核污染環境中

3. “The True Cost of Not Providing Employee Training,” SH!FT 網站，2018 年 4 月 19 日，<https://www.shiftelearning.com/blog/the-true-cost-of-not-providing-employee-training>，瀏覽日期 2020 年 4 月 23 日。

完成任務的單位，是由於他們在訓練時，便已針對各種化生放核狀況有所要求、督導及驗證，在執行其他訓練時亦將化生放核狀況列入考量，如每個月的交流演訓。在化生放核污染環境下穿著防護服，不只是考量舒適與否，更是攸關生存與任務是否順遂。透過狀況演練得以使士兵們學習基本生存技能及執行基礎任務，也能使領導者驗證他們的部隊是否已準備好與具有大規模毀滅性武器敵人交戰的能力。

Much like doctors, surgeons, and nurses make a hospital function, officers, noncommissioned officers, and junior enlisted Soldiers make the Army function. Leaders need to ensure that the Soldiers in their formations are experts not only in their individual crafts, but also in basic vital soldiering skills. These skills include surviving the fight in a contaminated environment, which validates the required training in STP 21-1-SMCT prior to an enemy engagement.

如同醫生及護士維持醫院的運作，軍、士官及初階士兵們同樣地維持著陸軍的運作。領導者需要確保部隊中的士兵們不單只是具備個人專業本職，也必須具備基本的生存技能。這些技能包含如何在污染作戰環境中生存，以驗證在戰士陣中要務作戰技能 (STP 21-1-SMCT) 中所論及交戰前的訓練項目。4

References 參考文獻

1. TM 3-4230-229-10, Operator's Manual for Decontaminating Kit, Skin: M291 (4230-01-251-8702), 2 October 1989.
2. TM 3-4230-235-10, Operator's Manual for Decontamination Kit, Individual Equipment: M295 (6850-01-357-8456), 21 November 2008.
3. TM 3-4240-542-13&P, Operator and Field Maintenance Manual (Including Repair Parts and Special Tools List) for Mask, Chemical-Biological: Joint Service General Purpose, Field, M50 (4240-01-512-4431) Small (4240-01-512-4434) Medium (4240-01-512-4437) Large and Mask, Chemical-Biological: Joint Service General Purpose, Combat Vehicle, M51 (4240-01-512-4429) Small (4240-01-512-4435) Medium (4240-01-512-4436) Large, 30 May 2008.
4. TM 3-6665-307-10, Operator's Manual for Chemical Agent Detector Kit, M256 (6665-01-016-8399) and M256A1 (6665-01-133-4964, 1 September 1985.
5. TM 3-6665-311-10, Operator's Manual for Paper, Chemical Agent Detector: M9 (6665-01-226-5589), 31 August 1998.

4. STP 21-1-SMCT, Soldiers Manual of Common Tasks: Warrior Skills Level 1.
戰士陣中要務作戰技能：作戰技巧第一級，2015 年 8 月版。