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NBC DEFENCE SPECIALIST OCCUPATIONS: AN ESSENTIAL REQUIREMENT FOR THE CANADIAN FORCES

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NBC DEFENCE SPECIALIST OCCUPATIONS: AN ESSENTIAL REQUIREMENT FOR THE CANADIAN FORCES

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Table of Contents

List of Tables

Abstract

In the last five years Canada has made a concerted effort to improve the capability of the Canadian Forces to operate in an NBC threat environment through the acquisition of new equipment, doctrine development, additional training courses, and the creation of a full time NBC Defence specialist unit. Although progress has been made, Canada's NBC Defence capability continues to be hindered by the lack of a permanent group of NBC Defence specialist officers and non-commissioned members. This has resulted in a reduced level of expertise in the Canadian Forces (CF) which does not meet the requirements of the current threat environment. This essay starts by looking at the NBC threat and the requirement for the CF to operate in an NBC environment. It then describes NBC Defence specialist functions and organizations, as well as difficulties associated with the haphazard manning of NBC Defence specialist positions, as is currently done within the Canadian Forces. This essay reviews the NBC Defence specialist capabilities of a number of other countries to discern the benefits associated with having an NBC Defence Corps or occupation. The essay concludes that Canada would be better served by the creation of NBC Defence specialist occupations for officers and non-commissioned members within the Canadian Military Engineers, and describes the numbers required, employment, and training.

Chapter 1 - Introduction[1]

> There does not exist an NBCD-specific MOC within the CF. In all but a handful of cases at all-unit and headquarters level, NBCD is a secondary duty. Therefore specialists are drawn from all types of military occupations.
>
> Chief of Review Services, 2001[2]

While various forms of chemical and biological warfare have been used for centuries, the Canadian Army was unprepared for the first massive use of chemicals on the battlefield during the First World War. During the Second World War, Canada and her allies were ready for the use of the same chemical agents, but were unaware of, and unprotected against the nerve agents developed by the Germans. While defensive measures were developed during the Cold War for known chemical agents and nuclear warfare, NATO was ill-equipped for the toxins and biological agents developed by the Soviet Union. Canada's ability to deal with NBC[3] threats fell dramatically after the collapse of the Warsaw Pact and Canada's withdrawal from Europe, despite the growing threat from new agents and the worldwide proliferation of NBC technology and expertise. With the increased operational tempo of the Canadian Forces (CF) during the 1990s, the decline in NBC Defence capability

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[1] For academic reasons, this is an unclassified paper, and therefore, only unclassified information from the 2001 Evaluation of NBC Defence by the Chief of Review Services has been included. It is certainly not the intention of this essay to provide a historical overview of NBC events; rather, they are used to illustrate the threat and requirement for specialists.

[2] Department of National Defence, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II* (NDHQ: file 1258-127 (CRS), May 2001), 42.

[3] A number of different acronyms are used with regard to nuclear, biological, chemical and radiological threats. Historically, NBC was used, with the implication that the radiological hazard was encompassed by nuclear. The advent, however, of a pure radiological hazard has lead to the adoption of a number of different acronyms, including CBRN, CBR, NBCR, and RNBC. The term Weapons of Mass Destruction or WMD is also widely used. This paper will use the traditional NBC to cover the nuclear, biological, chemical and radiological threats, including those resulting from toxic industrial materials. In the case of quotes and organization names, however, the actual acronym will be used.

was further exacerbated by the lack of equipment acquisition and time to conduct individual and collective training.[4]

As a result, in the last five years Canada has made a concerted effort to improve the capability of the CF to operate in an NBC environment[5] through the acquisition of new equipment, doctrine development, and the creation of a full time NBC Defence specialist unit. Although progress has been made, there still remains the encumbrance that has reduced Canada's NBC Defence capability: the lack of a permanent group of NBC Defence specialist officers and non-commissioned members (NCM). This inadequacy has hindered the development and retention of long-term NBC Defence expertise and skills for operational employment, concept and doctrine development, equipment acquisition, and training.

Despite the creation of the Joint NBC Defence Company (Joint NBCD Coy) in 2002, and the growing threat of NBC hazards on domestic and international operations, members of the CF continue to be assigned to NBC Defence specialist positions as a temporary assignment. The high operational tempo of the CF, and an inadequate appreciation of the NBC threat and the expertise required, has resulted in Commanders often disregarding the requirement for these specialists. The current occupational structure of the CF does not address the growing need for NBC Defence specialists, and therefore there is a continual

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[4] Department of National Defence, B-GJ-005-311/FP-000 *Canadian Forces Nuclear, Biological and Chemical Defence Strategic Doctrine* (Ottawa: DND, November 2004), GL-E-10. Nuclear, biological, chemical defence is defined as "All measures designed to defend against attacks with nuclear, biological, chemical and radiological weapons or the hazards arising from Release Other Than Attack. *Related terms: nuclear defence; radiological defence; biological defence; chemical defence.* (AAP-21)."

[5] DND, B-GJ-005-311/FP-000 *Nuclear, Biological and Chemical Defence Strategic Doctrine …*, GL-E-10. "Conditions found in an area resulting from immediate or persisting effects of NBC attacks or Release Other Than Attack. (AAP-21)."

drain on NBC Defence expertise when the individuals return to their original occupation. As a result, NBC Defence staff often lack sufficient knowledge and experience to fulfill their operational, training, and staff functions, and are non-effective for a significant period of time after being assigned to an NBC Defence position. This is also costly in terms of training time and resources, and poses a greater risk during CF operations when timeliness of information and advice is critical for survival in an NBC environment.

A number of other countries maintain separate NBC Defence specialist corps and occupations, or have assigned the NBC Defence responsibility to one branch or corps, primarily their Engineer Corps, rather than taking an all-arms approach. An analysis of the NBC Defence capabilities of these countries indicates that those with an NBC Defence specialist corps and/or occupations are better prepared to implement NBC Defence measures than those nations that treat NBC Defence as an all-arms responsibility. Not only do NBC Defence specialists bring a required capability to the battlefield, they also provide the expertise to properly train and prepare other organizations to survive in an NBC environment. They demonstrate this by participating in operations where there is a significant NBC threat.

Based on these considerations, one can argue that the creation of NBC Defence specialist occupations within the CF would provide the well-trained, knowledgeable and experienced personnel required to fulfill functions in operational NBC Defence specialist units. In addition, experienced personnel would also be available to fill NBC Defence specialist positions in command and formation headquarters, training units, and research and

development establishments. The long-term employment of personnel as NBC Defence specialists would reduce the drain of NBC Defence experience and enhance the ability of the CF to operate in an NBC environment. There may be challenges to this approach, due in part, to a lack of interest in NBC Defence and a desire to minimize the number of occupations. These factors can be overcome by a thorough review of the positions where NBC Defence specialists may be employed to create an acceptable breadth of employment and career progression, or by creating NBC Defence as a sub-occupation within existing occupation. A review of the potential positions that should be filled by NBC Defence specialists appears to provide sufficient potential for separate officer and NCM occupations, without increasing the manning level of the CF. These occupations, as this essay will demonstrate, would be larger than a number of existing occupations in the CF.

This essay will commence with a description of the NBC threat facing Canada and the CF on operations in order to demonstrate the requirement for an NBC Defence specialist capability. It will be followed by a look at the doctrinal functions and responsibilities of NBC Defence specialists and the organizations that exist in the CF. The essay will then discuss NBC Defence specialist manning to demonstrate the difficulties associated with the ad hoc manner that is currently being used. As many countries are increasing their NBC Defence specialist capabilities, this essay will review their NBC Defence structure in order to determine the benefits available to those countries based on how they manage their NBC Defence specialists. The remainder of the essay will present the feasibility of NBC Defence specialist occupations within the CF, and conclude that these officer and NCM occupations would be best assigned to the Canadian Military Engineers.

Chapter 2 - The NBC Threat

> On September the 11th [2001], the people of North America learned that two vast oceans and friendly neighbours cannot fully shield us from the dangers of the 21st century.
>
> President George W. Bush[6]

Introduction

Despite the end of the Cold War, the world remains in a period of insecurity with continuing regional conflicts and a growing number of failed or fragile states. There has been substantial growth in the capabilities and objectives of transnational terrorist, extremist, and criminal organizations, which employ asymmetric methods to discredit governments, disrupt military forces, and create terror among civilians.[7] The potential use or release of NBC hazards and weapons remains a viable threat to world stability and human security. Despite efforts to prevent it, there is evidence of ongoing proliferation and development of NBC weapons and their delivery systems throughout the world. At the same time, the worldwide growth of industries that require chemical, biological, and radiological materials increases the risk of a release of toxic industrial material (TIM),[8] as a result of neglectful maintenance and operation, natural disasters, terrorism, and collateral damage from military operations.

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[6] Brian Laghi and Alan Freeman, "The Speech: President Promotes War on Terror by Quoting Mackenzie King," *Toronto Globe and Mail*, 2 December 2004, 1.

[7] Department of National Defence, *The Asymmetric Threat* (Ottawa: DND DCDS, 2001), 1-2. "The asymmetric threat is a term to describe attempts to circumvent or undermine an opponent's strengths while exploiting his weaknesses, using methods that differ significantly from the opponent's usual mode of operations."

[8] DND, B-GJ-005-311/FP-000 *Nuclear, Biological and Chemical Defence Strategic Doctrine …,* GL-E-14. "A generic term for toxic or radioactive substances in solid, liquid, aerosolized or gaseous form. These may be used, or stored for use, for industrial, commercial, medical, military or domestic purposes. TIM may be chemical, biological or radioactive and described as Toxic Industrial Chemicals (TIC), Toxic Industrial Biologicals (TIB) or Toxic Industrial Radiologicals (TIR)."

The growing requirement for military forces to participate in the "three block war"[9] in urban areas with abundant toxic materials nearby, and against an adversary employing asymmetric warfare, also increases the chances that TIM will be encountered. This chapter will analyze the NBC threat to Canada and the CF, in order to demonstrate the requirement for a robust NBC Defence capability that includes the requirement for NBC Defence specialists.

NBC Warfare

Throughout history, mankind has continuously developed new military weapons. Various forms of chemical and biological warfare have been employed for centuries, while nuclear warfare is a relatively recent addition. The rapid development of industry and technology in the western world during the 19th and 20th centuries provided mankind with the capability to discover and mass-produce toxic chemicals and biological pathogens, which were then converted for military use. The most prominent use of chemical warfare occurred during the First World War and resulted in over a million casualties and about 100,000 deaths. While initial chemical attacks involved the massive use of chemicals during major offensives, it was quickly learned that the immobility of the chemical dispersal systems, danger to friendly troops, and dependence on wind direction, greatly reduced the effectiveness of chemical weapons. As a result, the objective of chemical warfare became one of attrition and harassment to wear down and kill soldiers holding the static trenches.[10]

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[9] The "three block war", coined by General Krulak, Commandant USMC, envisions that operations within a three block urban area may involve the concurrent feeding of refugees and providing other humanitarian relief in one area, separating fighting warlords and their tribes in another, and mid-intensity, highly lethal combat in the third area.

[10] Tim Cook, *No Place to Run: The Canadian Corps and Gas Warfare in the First World War* (Vancouver BC: UBC Press, 1999), 157. In 1917, a whole German division had to be pulled out of the line for rest after having to wear their respirators for over seven hours while subject to harassing chemical artillery shells.

During the Second World War, Japan produced biological weapons and experimented with them in China. The other major participants, meanwhile, were prepared to conduct chemical warfare, however, in the end, chemicals were not employed. The new atomic weapons were used for the first time at Hiroshima and Nagasaki in 1945. Other prominent state-sponsored use of NBC weapons during the 20th century includes Italy's use of blister agents during the invasion of Ethiopia prior to the Second World War, and the use of chemical agents during the Iraq-Iran conflict in the 1980s. The Center for Non-Proliferation Studies has identified at least forty-six instances of chemical and biological weapon use during the 20th century.[11] Advances in technology in the 20th century have resulted in chemical agents that are more persistent and capable of defeating much of our current NBC Defence equipment. Biological weapons are often referred to as "a poor man's atomic bomb," and recent advances in biotechnology and genetic engineering have enhanced their impact as potential weapons. The discovery of the atom and fission led to the development of nuclear weapons during the Second World War. While the number of states with nuclear weapons continues to increase, today's threat is more likely radiological contamination resulting from improvised radiological devices.

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[11] James M. Smith, Searching for National Security in an NBC World: four Papers on Changing Nuclear, Biological, and Chemical Threats and US Government Policy in the Post-Cold War International Security Environment (Colorado Springs, Colo.: US Air Force Academy, 2000), 149.

Lieutenant-Colonel J.J. Bailliu, "Canada and Chemical Warfare," (Master of Arts in War Studies thesis, Royal Military College of Canada, 1989), 39. Some of the state-sponsored usage includes: "USSR (1919-1921), Middle East and northwestern frontier of India (early 1920s), French and Spanish Morocco (mid-1920s), northern China (early 1930s), Ethiopia (1935-1936), Spain (1936), China (1937-1945), Indo-China (1947), Israel (1948), Greece (1949), Korea (1951-1952), Cuba (1957), Algeria (1957), Rio de Oro (1958), China (1958), Yemen (1963-1967), Iraq (1965), Indo-China (1961-1970), Guinea-Bissau (1968), Palestine (1969), Angola (1969), and Rhodesia (1970)." To this list must be added: China (1979), Afghanistan (1980s), and Iraq-Iran (1980s).

Despite efforts to control and eliminate the proliferation of NBC weapons, there are still many states that are attempting to acquire or develop these capabilities ". . . whether to gain international prestige, deter adversaries or to strengthen their relative positions in regional or border disputes."[12] Chemical and biological warfare has been employed for centuries, but only over the last century have serious attempts been made by the international community to prohibit this type of warfare. After the First World War, the movement to ban chemical warfare resulted in the creation of the *Protocol Prohibiting the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, Geneva June 17, 1925*. The *1993 Paris Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction* provided more stringent controls on chemical warfare, and 168 member states have now renounced the use of chemical weapons. Similarly, measures to control biological agents were implemented with the *1972 Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (BTWC)*. The *Non-Proliferation of Nuclear Weapons Treaty* was brought into force in 1970, and was followed in 1996 by the *Comprehensive Test Ban Treaty*. This treaty, however, has not entered into force.[13] It is now estimated that nuclear weapon capabilities are possessed by nine nations, with several more pursuing their development. While in 1980 there were indications that 12 nations possessed chemical weapons, it is now estimated that thirty-one states have chemical or biological weapons programs.[14] The revelations in 1992 of Dr

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12 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine* …, 1-1-1.

13 Ibid., 1-2-2.

14 Smith, Searching for National Security in an NBC World…, 149.

Kanatjan Alibekov, a Soviet defector now known as Ken Alibek, awoke the western world to the magnitude of the Soviet biological warfare program, this, despite the Soviet Union signing the BTWC.[15] While Canada honours the prohibitions on NBC weapons, there will be adversaries who will not, and therefore, the Canadian Forces must be prepared to operate in an NBC environment.

There is evidence that technologies and scientific expertise have become available to those nations or organizations wishing to develop an NBC capability. The disintegration of the Soviet Union, and the cancellation of NBC weapon programs in South Africa and Argentina have increased the number of unemployed experts. Dr Abdul Qadeer Khan, a leading scientist in the Pakistan nuclear development programme, was arrested in February 2004 for selling nuclear weapon information to North Korea, Libya and Iran.[16] While the production of nuclear weapons takes considerable resources, any country, given technical expertise and even a basic pharmaceutical, pesticide, fertilizer, petrochemical, or brewing industry, could produce and weaponize biological and chemical agents. According to Edward Spiers, it would appear that the ". . . NBC threat is actually increasing rather than diminishing."[17] The new *Canadian Forces Nuclear, Biological and Chemical Defence Strategic Doctrine* manual notes:

> Of particular concern is the potential spread of chemical, biological, radiological and nuclear (CBRN) material to terrorist organizations, whether

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[15] Edward M. Spiers, *Weapons of Mass Destruction: Prospects for Proliferation* (London: Macmillan Press; New York: St. Martin's Press, 2000), 68-69.

[16] Lynda Hurst, "Doomsday Clock Keeps Ticking," *Toronto Star*, 27 November 2004, A19-A20.

[17] John Norris and Will Fowler, *NBC: Nuclear, Biological, and Chemical Warfare on the Modern Battlefield* (Herndon, VA: Brassey's, 1997), 11.

> through theft from poorly-guarded stockpiles, expropriation from failed states suffering a collapse of authority, or through clandestine proliferation networks. . . .[18]

Regional Conflicts and Failed States

With the disintegration of the Warsaw Pact and other states in the late 20th century, ". . . nationalism, tribalism and religious extremism have replaced ideology as the leading cause of national and regional disputes . . ."[19] particularly in the Third World. These are the same areas that face corruption, poverty, water shortages, and endemic disease, and are ruled by either dictatorial or weak governments. Many of the ongoing regional conflicts involve nations that possess, or are attempting to acquire or develop, weapons of mass destruction, and the use of NBC weapons is no longer relegated to conventional warfare. Small states may consider that NBC weapons provide an equalizer to western technological superiority. Evidence indicates that failing or fragile ". . . states with troubling international records have sought, experimented with, and in some cases employed such weapons."[20] According to Charles Krauthammer "We have just now entered an era in which the capacity for inflicting mass death, and thus posing a threat both to world peace and to the dominant power, resides in small, peripheral states."[21] In some states the leaders often do not have an absolute sense of responsibility to their people, hence there is little to deter the internal employment of NBC weapons against rebels or ethnic groups, as occurred in Iraq under Saddam Hussein's regime.

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[18] DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine* …, 1-1-1.

[19] Department of National Defence. *The Future Security Environment.* (Kingston: DND Directorate Land Strategic Concepts, 1999), iv.

[20] DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine* …, 1-2-1.

[21] Charles Krauthammer, "Unipolar Moment Revisited," *The National Interest*, No 70 (Winter 2002/03): 9.

It is now commonly recognized that failed and fragile states can provide a haven for terrorists by choice or inability to properly control and govern their territory and people.[22]

Terrorist, Extremist and Criminal Organizations

The last ten years have seen a substantial growth in the size and capabilities of terrorist, extremist, and criminal organizations that can now project force across international boundaries. These organizations are now better educated, trained, organized, equipped, and led. There has been a fundamental change from the publicity-seeking "ideological" terrorism that the world knew in the last half of the 20th century, to "revenge-based" terrorism that now challenges the world. According to the Directorate of Nuclear Biological Chemical Defence (DNBCD),

> The attacks of 11 September 2001 demonstrated the willingness of terrorist organizations to undertake operations deliberately intended to cause mass civilian casualties. A terrorist attack involving CBRN weapons could be even more deadly . . . .[23]

With regard to weapons of mass destruction, terrorist organizations have ". . . sought to acquire these technologies . . . [to] offset the conventional military superiority of developed states and engender fear among target populations."[24] The attack on the Tokyo subway by the religious group Aum Shinrikyo in March 1995 with the nerve agent sarin, resulting in 12 deaths and 5,500 casualties, was the first publicly recognized example of the terrorist use of chemical weapons. Aum Shinrikyo had previously attempted to acquire

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22 Privy Council Office, *Securing an Open Society: Canada's National Security Policy.* (Ottawa: Privy Council Office, 2004), 6.

23 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine* …, 1-1-1.

24 Ibid.

nuclear weapons, and biological and radiological material, and had made several previous attacks in Japan, one in particular directed at the American Seventh Fleet.[25] In 1999, the Canadian Security and Intelligence Service (CSIS) warned of the seeming resurgence of the Aum Shinrikyo organization, and expressed concern ". . . given the technical knowledge possessed by some of its remaining followers and the possibility of yet-undiscovered stocks of CB [Chemical-Biological] agents or precursors."[26] In another case, Chechen rebels placed Cesium 137, a radioactive material used for industrial and medical purposes, in a Moscow park in November 1995. The only bioterrorism incident in North America

> … occurred in Oregon in 1984 when followers of Indian guru Bhagwan Shree Rajneesh, hoping to sway a local election, unleashed a salmonella poisoning attack at ten restaurants, sickening 751 people but killing none.[27]

These actions illustrate the potential threat posed by terrorist and extremist groups when they have the ability to acquire the materials and the technical knowledge to construct the devices. Prior to the introduction of stringent controls, there were many instances of chemical and biological material being purchased through the North American postal system. For example, a member of a white supremist group in the United States (US) was apprehended after ordering the bubonic plague bacteria through the mail in 1995.[28] The Internet now contains numerous sites that provide "how to" information, thus illustrating the

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[25] Spiers, *Weapons of Mass Destruction* …, 77. Previous to the 1995 attack, the Aum Shinrikyo group had made a successful attack in the town of Matsumoto in June 1994. A van travelling through the streets, also released sarin, causing 200 casualties and seven deaths.

[26] Canadian Security Intelligence Service, "Chemical, Biological, Radiological and Nuclear Terrorism," http://www.csis-scrs.gc.ca/eng/operat/ct_e.html; Internet; accessed 16 December 2004.

[27] Smith, *Searching for National Security in an NBC World* …, 150.

[28] Leonard A. Cole, *The Eleventh Plague: the Politics of Biological and Chemical Warfare* (New York: W.H. Freeman, 1997), 3-4.

vastness of the problem. Meanwhile, the toxin ricin has been found in several terrorist hideouts, and in 2003, 14 Islamic radicals were arrested in London for producing it.[29] On 23 November 2004, Iraqi and coalition forces discovered an explosive weapon laboratory containing toxic chemicals in Fallujah.[30] These discoveries illustrate the potential threat from improvised NBC devices.[31]

> Although terrorist use of WMDs is a low probability, its impact should it occur, would be enormous, not only for its physical effects and enduring legacy on the target urban population but also for its psychological effect across the world . . . .[32]

Governments and extremists have also used NBC weapons for "political" purposes. According to Julian Perry Robinson, a well-known writer on chemical and biological warfare, allegations were circulated in 1969 that a Yugoslavian covert organization, Unutrašnja Državna Bezbednost, was using chemical and biological weapons in Europe for assassination purposes.[33] Ricin, dispensed in an "umbrella gun", was used against two Bulgarian defectors in 1978. Just last year, it was speculated that Viktor Yushchenko, a candidate in the 2004 Ukrainian Presidential election, was poisoned with dioxin, the same

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[29] International Atomic Energy Agency, "A More Secure World: Our Shared Responsibility;" http://www.un.org/secureworld/report3.pdf; Internet; accessed 14 December 2004, 41.
Jeffery Bale et al, Ricin Found in London: An al Qa'ida Connection?. Center for Nonproliferation Studies, available at http://cns.miis.edu/pubs/reports/ricin.htm; Internet; accessed 10 January 2005.

[30] Combined Press Information Centre, *Fallujah Update: Insurgent Chemical/Explosive Weapons Laboratory*, 26 November 2004.

[31] Department of National Defence, B-GJ-005-311/FP-010 *Canadian Forces Nuclear, Biological and Chemical Defence Operations (draft)* (Ottawa: DND, November 2004), 1-2-4. Any device designed to disseminate chemical, biological, radiological and/or nuclear material. The use of improvised CBRN devices is normally associated with terrorist/criminal acts.

[32] Jane's Information Group, *Jane's Nuclear, Biological and Chemical Defence 2004-2005.* 17th ed. (Coulsdon, Surrey, UK; Alexandria, Va.: Jane's Information Group, 2004), [18].

[33] Julian Perry Robinson, *The Problem of Chemical and Biological Warfare: Volume I The Rise of CB Weapons* (Stockholm: Stockholm International Peace Research Institute, 1971), 110.

chemical contained in Agent Orange.[34] The dissemination of anthrax-laden letters within the US after of the events of 11 September 2001 resulted in 23 people contracting anthrax, with five fatalities. The impact on the public, however, was far greater, with some government buildings closed for months and 20 postal facilities requiring decontamination. Subsequently, US government authorities had to deal with more than 15,000 hoaxes that overloaded the first responders throughout the US.

In addition to terrorist and extremist groups, the strength and capability of organized crime is also rising. According to the International Atomic Energy Agency "Transnational organized crime is a menace to States and societies, eroding human security and the fundamental obligation of States to provide for law and order."[35] In some cases, financial resources generated by organized crime have been linked to terrorist organizations. Of particular concern are the employment of crude improvised chemical devices in Colombia and the discovery of NBC protective equipment in a drug laboratory. In some cases, these criminal groups rival the capabilities of the national military and security force.

Canada is not immune. CSIS has identified that the US is the principal target of terrorist groups operating internationally, and after the US, ". . . there are more international terrorist organizations active in Canada than anywhere in the world."[36] Stewart Bell, in his book *Cold Terror: How Canada Nurtures and Exports Terrorism around the World*, relates

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[34] Emma Ross, "Most Harmful Dioxin Found in Yushchenko," *Toronto Star*, 18 December 2004, A30.

[35] International Atomic Energy Agency, A More Secure World …, 52-53.

[36] Canadian Security Intelligence Service, "Counter-Terrorism," http://www.csis-scrs.gc.ca/eng/operat/ct_e.html; Internet; accessed 6 September 2004.

how Canada has become a base for some of the most violent terrorist organizations in the world.[37] In 1993, Canada Customs seized 130 grams of ricin at the Alaska-Yukon border from an American linked to "survivalist" groups. In 1996, chemical protective suits belonging to a US right-wing militia group were found in a British Columbia cache. The anonymous threats in March 1998 to use "chemical or bacteriological products" in Montreal, were revealed during the subsequent investigation to have been a trial run by a jihadist terrorist group in order to test the response procedures of the local authorities.[38] In Barrie, Ontario over the space of two months in 2004, chemicals were maliciously used four times, illustrating that the use of these substances is becoming more predominant as a means of mischief, revenge or terror.[39]

During a conventional conflict, preparation and retaliation are the main deterrents to the use of NBC weapons. This worked for over four decades during the Cold War; however, retaliation is not an effective deterrent for these new transnational terrorist and extremist organizations. The growth of fanatical or extremist terrorism is of particular concern, as "They cannot be deterred because they are either willing to die for their cause or able to escape retaliation."[40] A terrorist attack involving NBC weapons would likely cause numerous casualties and have a devastating psychological impact on western life as we know

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[37] Stewart Bell, *Cold Terror: How Canada Nurtures and Exports Terrorism Around the World* (Etobicoke, ON.: Wiley, 2004), ix-x.

[38] CSIS, "Chemical, Biological, Radiological and Nuclear Terrorism."

[39] Robin MacLennan, "Barrie Apartments Evacuated," *The Barrie Examiner*, 30 November 2004, A1, A5.

[40] G. John Ikenberry, "America's Imperial Ambition" *Foreign Affairs,* 81, no.5 (September/October 2002): 51.

it, a ". . . reality that has prompted jihadist terrorist groups to advocate the use of CBRN weapons against western targets, including Canada."[41] According to CSIS, it is not a question of if terrorists will use NBC weapons to create mass casualties, but rather, when this will occur.[42] These terrorist attacks may occur against targets within Canada or may be directed against the CF on deployed operations.

Toxic Industrial Material (TIM)

The expanding usage of toxic industrial materials in industry, laboratories, hospitals and utilities, has resulted in the development, storage, and movement of huge quantities of toxic materials every day. This increases the potential of hazards being released into the environment as a result of neglect, incidental damage, natural disasters, terrorist action or military operations. Radioactive sources are now commonly used in medical facilities and many industries, and the number of radioactive storage facilities is growing. Every year there are numerous incidents of radioactive material that is lost, misplaced, stolen, or sold on the black market.[43] Biological hazards may be released from a storage or research facility with endemic and infectious diseases accidentally, or as a result of an attack or collateral damage. A cyber attack on the vulnerable control systems of TIM facilities may result in a ROTA event[44]. Toxic industrial chemicals can pose a significant hazard to military forces, as

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41 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine* …, 1-1-1.

42 CSIS, "Chemical, Biological, Radiological and Nuclear Terrorism."

43 Peter Gorrie, "Security Lax for Nuclear Materials," *Toronto Star*, 11 December 2004, A8. In the US it is estimated that there is one instance involving lost or stolen radioactive material each day.

44 Release other than Attack (ROTA). The unauthorized use of NBC weapons, or the intentional or accidental release of NBC hazards, including TIM, resulting from natural disasters, accidents, poor maintenance, operator error, terrorist action or collateral damage.

most NBC protective equipment is ineffective. The hazards posed by TIM require specially equipped NBC defence specialists to detect, identify, and decontaminate these hazards. The US itself, faces enormous challenges protecting its hazardous infrastructure.

> Of particular concern are some 15,000 chemical plants, refineries and sites that use or store big quantities of hazardous materials. The [US] Environmental Protection Agency has identified 123 places where toxic gases released by a terrorist attack could kill or injure more than one million people, and 700 other places where an attack could kill or injure 100,000 people.[45]

Canada, being an industrial nation, faces the same challenges and threats from TIM. In November 1979, a train derailment in Mississauga, Ontario, caused a propane explosion and the release of chlorine from one of the railcars, and resulted in the evacuation of 250,000 residents. Industrialization has resulted in potential dangers, not only among the western world, but also in the developing world. The CF, deployed overseas, have already encountered hazards caused by a ROTA release of TIM. In December 1999, CF personnel discovered a number of damaged radioactive sources in a metal fabrication plant at Glogovac, Kosovo, which had been used as a Serb air defence site and was bombed during the air campaign. They could not resolve the situation, and a team from Canada had to conduct the site investigation confirming that the hazard spheres contained Cesium 137.[46]

In the last 25 years there have been numerous events involving either NBC munitions or TIM. The worst chemical incident of modern times occurred in 1984 at the Union Carbide

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[45] Editorial, "Avoiding Chemical Catastrophe," *New York Times* (Late Edition (East Coast)), (April 1, 2003): A18; http://proquest.com; Internet; accessed 10 October 2004.

[46] Lieutenant-Commander R. Wall, *Final Report - Technical Assist Visit to Kosovo* (NDHQ: file 3453-23 (DNBCD), 2 March 2002), 1/11 - 2/11.

factory at Bhopal, India, where, due to poorly designed equipment and human error, toxic chemicals were released over an area of 40 square kilometres, resulting in more than 500,000 casualties and 4,000 deaths. The area remains contaminated to this day, and the death toll has increased to over 12,000. Unintentional radiological releases occurred at Three Mile Island in 1979, and the incident at Chernobyl in 1986 contaminated an area inhabited by over three million people and caused the deaths of several thousand. Numerous incidents have occurred at military NBC munitions production, storage or research and development facilities, the best known being the 1979 release of anthrax at Sverdlovsk, USSR, that resulted in 66 deaths.[47] Within Canada, damaged chemical munitions continue to be discovered on CF installations, such as happened at Borden in 2004.

Conclusion

"The proliferation of CBRN weapons and materials and their associated delivery systems therefore poses a serious risk to Canadians."[48] With the continuation of regional conflicts and intrastate strife, as well as terrorism in the near future, there is an increased likelihood the CF will have to participate in operations in areas with potential NBC and TIM hazards. The threat or actual release of NBC or TIM may occur on any operation, including combat, aid of the civil power, peace support operations, or non-combatant evacuation. Indeed, the greatest NBC threat to Canadians is the terrorist use of conventional explosives against industrial facilities storing toxic materials. In addition, for the CF deployed on

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47 Jane's Information Group, *Jane's NBC Defence 2004-2005* …, 28. In 1992 President Boris Yeltsin confirmed that a quantity of anthrax was released from a military facility at Sverdlovsk in 1979, causing the deaths of at least 66 people.

48 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine* …, 1-2-1.

operations, the release of toxic materials from collateral damage remains a realistic hazard. Today, the Cold War threat of conventional forces employing nuclear bombs and missiles, and massive amounts of military chemical or biological munitions has diminished. Our forces, rather, must be prepared to conduct operations in a variety of locations with varying threats from the unintentional release of chemical, biological or radiological hazards, to their deliberate use by state-directed conventional and irregular military forces, or by organized terrorist, extremist or criminal groups who have little regard for human life.[49] The ability to survive and continue operations in an NBC environment requires an effective NBC Defence capability, which, because of the growing preponderance and lethality of hazards, requires personnel with specialized equipment, procedures, and training.

[49] Department of National Defence, B-GL-300-001/FP-000 *Conduct of Land Operations - Operational Level Doctrine for the Canadian Army (English)* (Ottawa: DND, 1998), 9.

Chapter 3 - NBC Defence Specialists in the Canadian Forces

Knowledge Dispels Fear

CFNBCS Motto

Introduction

The objective of NBC Defence is to deter the use of NBC weapons, and in case an event occurs, to provide warning, protection, and the re-establishment of combat capabilities so the military force can achieve its objectives. While in general terms, an NBC environment is considered to be another condition of the battlefield, the current threat of NBC weapons or a ROTA event has resulted in a change of philosophy for NBC defence within the CF. In the past, NBC hazards were left almost exclusively to units to handle, and Canada relied upon its allies for NBC Defence capabilities beyond that organic to units. Doctrinal requirements for formation-level NBC Defence, as a result, were adopted in a haphazard manner. With the introduction of the new Joint NBCD Coy, it readily became clear that there was no NATO and CF doctrine to support the employment of NBC Defence specialists. Steps are now being taken by DNBCD to correct this deficiency. This chapter will look at the required doctrinal functions and responsibilities of NBC Defence specialists. It will then discuss NBC Defence specialist organizations and employment in the CF to demonstrate the difficulties associated with manning NBC Defence specialist organizations in the current ad hoc manner.

Canadian Forces Responsibilities

The CF must be prepared to survive the effects of NBC attacks or hazards resulting from ROTA events and resume operations as quickly as possible; it also has a number of responsibilities with respect to NBC hazards in the defence of Canada. In accordance with the National Counter-Terrorism Plan, the CF plays a supporting role, and is responsible for providing CBRN technical assistance to other government organizations and an incident response capability. In terms of consequence management, it must contribute advice and technical assistance to determine the measures required to isolate, contain, and dispose of the hazards, as well as assist with the decontamination of property and persons. The CF must also be prepared to respond to a radiological incident under the Federal Nuclear Emergency Plan, as well as any emergency during visits to Canada by nuclear-propelled vessels and nuclear-capable vessels.[50] Indeed, the response by the CF to an NBC incident has occurred several times in the past. In one instance, following an accidental release of radioactive material at Chalk River in 1952, 1 Radiation Detection Unit (1 RDU), with about 700 members of the Royal Canadian Navy and Royal Canadian Air Force (RCAF), spent six months decontaminating reactor components.[51]

Within the Department of National Defence (DND), the Deputy Chief of the Defence Staff (DCDS) has overall responsibility for NBC Defence, and DNBCD performs this function on his behalf. DNBCD's responsibilities include advice and planning, training

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[50] DND, B-GJ-005-311/FP-010 *Nuclear, Biological and Chemical Defence Operations (draft 2004*)…, 1-2-4 - 1-2-7.

[51] Lieutenant-Colonel Kenneth John Holmes, *The History of the Canadian Military Engineers: Volume III, to 1971* (Toronto: Military Engineering Institute of Canada, 1997), 261-262.

policy and guidance, threat and vulnerability assessments, and the overview of NBC Defence activities on operations. In addition, DNBCD is charged with directing the acquisition and management of NBC Defence resources, as well as liaison with other Government departments such as Public Safety and Emergency Preparedness Canada with regard to counter-terrorism. The Director-General Health Services is responsible for providing NBC Defence medical advice and controlling medical countermeasures, as well as providing trained medical personnel. Assistant Deputy Minister (ADM) Materiel manages NBC Defence equipment, while NBC research and development is done by Defence Research and Development Canada (DRDC). ADM Infrastructure and Environment has the responsibility for developing contingencies to respond to toxic industrial hazards and managing the radiation safety program within DND.[52] Formal joint NBC Defence training for the CF is provided by the Canadian Forces Nuclear Biological Chemical School (CFNBCS) under the direction of ADM Human Resources - Military.

Force Generators - the Navy, Army and Air Force - are responsible for the NBC Defence readiness of their assigned forces, and may have to provide specialist NBC Defence elements as directed.[53] The three components each take a different approach to NBC Defence. The Air Force is very much focused at the Wing level, and therefore NBC Defence training and the conduct of NBC Defence activities, including specialist activities, is centralized at that level. Within the Navy, NBC Defence readiness preparations are centralized in schools on both coasts, while NBC Defence activities are limited to those

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52 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine*…, 1-2-7/1-2-8.

53 Ibid., 1-3-1 - 1-3-4.

integral to each ship. The Land Force has adopted a decentralized approach to NBC Defence training and the conduct of NBC Defence specialist activities, which has resulted in a disjointed training program and a lack of central control of NBC Defence specialist activities in Land Force formations.

NBC Defence Specialist Doctrine

NBC Defence policies, doctrine and capabilities allow CF formations and units to accomplish their objectives despite an NBC threat or attack. There is one specific NBC Defence task in the "Force Protection" capability area of the Canadian Joint Task List (CJTL), "T5.3 Conduct Nuclear, Biological and Chemical (NBC) Protection," which requires measures be taken to "Mitigate the effects of NBC and radiological weapons, conserve fighting power, diminish utility of weapons of mass destruction and contribute to deterrence."[54] The CJTL also includes a number of supporting sub-tasks, including one requiring measures to limit the effects of weapons of mass destruction. The other sub-tasks follow the five doctrinal components of NBC Defence: (1) Detection, Identification and Monitoring, (2) Warning and Reporting, (3) Physical Protection, (4) Hazard Management, and (5) Medical Counter-Measures and Support.[55] Detection, identification and monitoring

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[54] Department of National Defence, "Canadian Joint Task List Version 1.4," http://www.vcds.forces.gc.ca/dgsp/pubs/rep-pub/dda/cjtl/cjtl14/intro_e.asp; Internet; accessed 24 March 2005.

[55] Ibid. Sub-tasks are:
T 5.3.1 Implement National Disaster Control and Weapons of Mass Destruction Measures, including Nuclear Accident Response - Limit the effects of disaster (both national or as a result of widespread WMD use) on military units and, in coordination with OGDs/civil agencies, on other areas in Canada.
T 5.3.2 Conduct Detection, Identification and Monitoring - Detect, identify and monitor the arrival, dispersion and presence of NBC hazards.
T 5.3.3 Conduct NBC Warning and Reporting - Alert the force to the presence of and provide accurate and timely information on NBC hazards.
T 5.3.4 Execute NBC Individual and Collective Protection - Provide protection against NBC hazards ensuring combat power is maintained.

functions are essential to establish hazard awareness, and to implement other NBC Defence measures. Warning and reporting is the function of collecting, evaluating and disseminating hazard information in order to allow protective measures to be taken. Physical protection is necessary to enable military personnel, equipment and facilities to survive in an NBC event. Individuals are provided individual protective equipment (IPE) to survive in an NBC hazard area, while collective protection is required for activities that must performed in a safe area within the contaminated environment, such as those in command and control, medical and maintenance facilities, and rest centres. Hazard management entails pre-attack precautions, avoidance, containment, exposure control, and decontamination. The NBC medical component consists of medical counter-measures taken to reduce the hazard effects on personnel, and the treatment and evacuation of NBC casualties.[56]

NATO doctrine splits NBC Defence individual and organizational proficiency requirements into four levels: basic individual survival capabilities, more comprehensive knowledge by commanders, basic unit survival requirements with some personnel given additional training and resources for unit level activities, and the advanced capabilities of NBC Defence specialists (including medical support).[57] In accordance with Canadian doctrine being developed in B-GJ-005-311/FP-010 *Canadian Forces Nuclear, Biological and*

T 5.3.5 Conduct NBC Hazard Management - Undertake hazard avoidance and contamination control procedures to minimise susceptibility of equipment, platforms and personnel to NBC effects and to enable rapid recuperation following contamination.
T 5.3.6 Conduct Medical Counter Measures - Provide pre and post exposure treatment and medical support against the effects of NBC hazards.

[56] DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations (draft 2004)*…, 3-1-1 - 3-1-2.

[57] Department of National Defence, B-GJ-005-311/FP-001 *Canadian Forces Nuclear, Biological and Chemical Defence (NBCD) Operations* (Ottawa: DND, 2000), 6-84 - 6-96. This Commander's Guide is based on NATO Standardization Agreement 2150 NATO Standards of Proficiency for NBC Defence.

Chemical Defence Operations, NBC Defence capabilities are divided into three levels: Integral Support (NBCD IS), Close Support (NBCD CS), and General Support (NBCD GS).

NBCD IS consists of those integral procedures and activities that allow units to survive and continue operations in an NBC environment.[58] It comprises basic NBC Defence reconnaissance and survey tasks using general detection devices, immediate and operational decontamination, NBC Defence first aid, and the reporting and dissemination of NBC warnings. While every member of the CF is provided basic NBC Defence training in order to survive, some unit members receive additional training in order to perform unit NBC Defence activities. The three-week Unit NBC Defence Officer or two-week Unit NBC Defence Instructor courses at CFNBCS prepares personnel to train unit members and coordinate unit NBC Defence activities.[59] These individual are not NBC Defence specialists as they are not equipped and trained to perform NBCD GS or CS activities.

NBCD CS consists of those resources and activities beyond NBCD IS capabilities that allow a formation or unit to restore or maintain operational tempo. Doctrinally, NBCD CS is not well defined, nor are formations in the CF well-trained, manned and equipped to perform these functions. Often NBCD CS functions are secondary duties, performed by personnel who receive little formal training.[60] For example, within the Land Force, the brigade reconnaissance squadrons have a secondary duty to perform NBC reconnaissance,

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[58] DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations (draft 2004)*…, 3-3-1.

[59] DND, B-GJ-005-311/FP-001 *Nuclear Biological Chemical Defence Operations* (2000) …, 3-9 - 3-11. Battalion size units, air squadrons, and ships are supposed to have one or two qualified Unit NBC Defence Officers and one Unit NBC Defence Instructor per sub-unit.

[60] DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations (draft 2004)*…, 3-3-1.

and general support battalions have a secondary duty to perform thorough decontamination. Few of these personnel have taken the NBC Defence specialist courses at CFNBCS, nor is this requirement annotated for those positions.

NBCD GS consists of specialist NBC Defence functions that support all or part of a combined or joint force. Combat units have limited organic NBCD IS capabilities to survive and maintain operations, and are therefore dependent on NBCD CS or NBCD GS to restore full operational capability.[61] In accordance with NATO doctrine, NBCD GS organizations contain technically-trained personnel and specialized equipment that permit the following NBCD GS activities during combat operations and operations other than war (including domestic operations and counter-terrorism):[62]

a. specialist NBC surveillance and monitoring using specialized detection systems, including standoff and unmanned systems;[63]

b. specialist NBC reconnaissance and survey using specialized reconnaissance vehicles;[64]

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61 Ibid.

62 North Atlantic Treaty Organization, *Allied Joint Publication 3.8 Allied Joint Doctrine for NBC* (Brussels: NATO Standardization Agency, July 2003), 3-14 - 3-15.

63 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine …*, GL-E-11. NBC surveillance - The systematic observation of aerospace, surface areas, places, persons, or things by visual, electronic, mechanical, or other means for determining the presence or absence of NBC hazards.

64 Ibid., GL-E-4. A mission undertaken to obtain information by visual observation or other methods, to confirm or deny the presence of NBC hazards or attacks. It may include gathering information on enemy use of NBC weapons, associated hazards, or meteorological data for NBC hazard prediction.

c. sampling and identification of biological chemical and radiological agents (SIBCRA), as well as toxic industrial hazards;[65]

d. operation of deployable field laboratories to provide expedited hazard identification;

e. thorough and clearance decontamination of personnel, equipment, facilities and areas;[66]

f. containment and neutralization of hazards and improvised CBRN devices;

g. operation of fixed and transportable collective protection systems;[67]

h. NBC Centre activities to provide hazard prediction, warning and reporting;[68]

i. operation of a reachback capability for consultation and coordination with NBC Defence scientists, laboratories and other subject matter experts; and

j. provision of expert NBC Defence advice, liaison and incident management.

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[65] DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations (draft 2004)*…, 4-2-4. SIBRCA is the collection, transportation and identification of suspected chemical, biological and radioactive materials within a chain of custody in order to provide warning to friendly troops and support legal proceedings. The derivative terms SIBA, SICA and SIRA may be used for a single hazard environment.

[66] DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine …*, GL-E-5. Thorough decontamination reduces contamination on personnel, equipment, material and/or working areas, to permit partial or total removal of IPE to maintain operations with minimum degradation. It may include terrain decontamination. Clearance decontamination is the decontamination of equipment and/or personnel to a sufficient standard to allow unrestricted transportation, maintenance, employment and disposal.

[67] Ibid., GL-E-4. Collective Protection - Protection for a group of individuals in an NBC environment, which allows the relaxation of individual NBC protection.

[68] Ibid., GL-E-10. NBC Centre - A staff section responsible for NBC warning and reporting within a organized structure.

NBC Defence specialists, therefore, consist of those individuals who receive advanced training and whose primary function deals with the planning, coordination, training, and execution of NBCD CS and GS functions. Unit NBC Defence Officers and instructors cannot be considered as NBC Defence specialists as depicted in the B-GJ-005-311/FP-010 *Canadian Forces Nuclear Biological Chemical Defence Operations* manual.[69] The Unit NBC Defence Officer and Unit NBC Defence Instructor courses only provide training to enable individuals to perform a limited NBC Defence function as a secondary duty within a unit, not as an NBC Defence specialist. A comparison can be made with officers who take the Unit Security Officer course. They are not "security specialists," nor are they prepared to perform military police functions. Rather, they are prepared to perform integral unit security functions as a secondary duty. NBC Defence specialists require considerably more formal instruction than is provided on these two unit courses, augmented by experience and continual training.

In the CF, NBC Defence specialists are essential for three primary functions. Firstly, they perform staff functions in strategic-level, command and formation headquarters, where they operate NBC Centres, provide NBC Defence advice, develop NBC Defence policy, doctrine, and equipment capabilities, and plan and coordinate NBC Defence operations. Secondly, NBC Defence specialists are required to provide operational NBCD CS and GS capabilities in the Joint NBCD Coy, and other units when necessary. And finally, they provide NBC Defence specialist training, as well as training for unit NBC Defence staffs at

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[69] DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations (draft 2004)*…, 9-1-4.

CFNBCS, and in some cases, the provision of basic and unit NBC Defence training at other institutions.[70]

NBC Centres and NBC Defence Staff Officers

To survive in an NBC environment, dedicated NBC Defence specialist staffs are required to assist in the planning and execution of NBC defensive measures in national, command and formation headquarters. There has been a requirement for NBC Defence specialist officers for over 90 years. The first NBC Defence staff officers were established on the Western Front following the gas attacks in April 1915. Major Foulkes, Royal Engineers, was appointed Gas Advisor in the Headquarters of the British Expeditionary Force in May 1915,[71] and the British Gas Services was formally created as a separate entity in January 1916.[72] In May 1916, the Canadian Corps appointed Divisional Gas Officers (DGO) in order to provide more proficient anti-gas advice and training. Shortly afterwards, Brigade Gas Officers (BGO) were assigned to each Brigade.[73] The appointment of Gas Officers in the Brigades and Divisions, and eventually the Canadian Corps, served as the impetus for the creation of the Canadian Gas Services.[74] Archivist Tim Cook has noted that the assignment to gas services duties was not always welcome, and personnel fought hard to

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70 Ibid., 9-1-4 - 9-1-5. Other training establishments include CFRLS, CFFS, CFNES, CTTC Suffield and Air Force Wings.

71 Bailliu, "Canada and Chemical Warfare"…, 58-59.

72 Cook, *No Place to Run*…, 65.

73 Ibid., 61, 71-73. Initially it had been intended to employ NCOs in this role to form the nucleus of anti-gas defence, however, after three NCOs were trained from each division, they could not influence affairs, ". . . partly because of their lack of resources and organizational structure but also because of their low rank.."

74 Ibid., 109, 115. The Canadian Gas Services officers, often referred to as "canaries" wore a distinctive black and green band on their arm.

avoid it. The Canadian Gas Services officers implemented a training program within the Canadian Corps where all officers received anti-gas familiarization training, and one NCO from each sub-unit sized organization was trained to conduct and supervise gas training, equipment usage, and operations.[75] In 1916, the Canadian Gas Services was expanded with the addition of full-time Battalion Gas Officers, in order to supervise the company-level NCOs, and to provide better coordination with the BGO.[76] At the end of the war, the Canadian Gas Services became superfluous, and was eliminated in January 1919.[77]

While chemical agents were not used during the Second World War, both sides were prepared to conduct offensive chemical warfare, and trained and equipped their forces to survive if they were used. Canada started preparing for chemical warfare as early as 1936 with a small staff cell responsible for planning defensive chemical warfare. According to LCol Bailliu, however, it was the establishment of the Chemical Warfare Centre at Suffield, Alberta, which allowed Canada to realize her potential in the development of chemical warfare defense.[78] During the war, Unit Gas Officers were responsible for the gas training of their unit while chemical defence staff officers and technical officers were located at division and higher headquarters.[79]

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75 Ibid., 7, 73.

76 Ibid., 87. The Battalion Gas officer was tasked solely with anti-gas defence. He was in charge of defensive gas appliances, and inspected gas respirators, gas-proof dugouts, wind-valves, sprayers and horns. He helped to drill personnel in the use of respirators, and collected soil and gas samples so that they could be analyzed. "But the battalion gas officer's most important role was to continually teach - or enforce good gas discipline."

77 Ibid., 210.

78 Bailliu, "Canada and Chemical Warfare"…, Abstract.

79 War Office, Field Service Pocket Book Pamphlet No. 8 *Protection Against Gas* (London: War Office, 1941), 9.

Prior to the integration of the CF, NBC Defence functions were considered a secondary duty within the army and navy, while the RCAF personnel structure included a small Nuclear Defence Officer occupation of approximately 45 officers. This occupation was eliminated in December 1969, and the air force began experiencing the same disregard and erosion of NBC Defence expertise that was prevalent in the army and navy.[80] At the time of integration, Lieutenant-General Dare, the Vice Chief of the Defence Staff, recognized the high level of NBC Defence knowledge and expertise required, and did not support the assignment of NBC Defence as a specialty that could employ any officer.[81] In 1977, however, a final decision by the Military Occupation Structure Review Board recognized the employment of NBC Defence specialist officers as a common specialty. To provide the trained NBC Defence specialist officers, CFNBCS began conducting the NBC Staff Officer course (qualification code AB).[82] This course was replaced by the seven week Advanced NBC Defence Officer course (qualification code AIOM) in 1994.[83] In a Command and Staff

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80 Lieutenant-Colonel W.R. Johnston, *Employment of NBC Staff Officers (ASQ AB)* (NDHQ: file 5320-1 (DNBCC), 28 September 1987), 1. LCol Johnston attributed this degradation to be the result of the mismanagement and constant changing of NBC Defence staff officers.

81 Ibid., 3.

82 Ibid., 2. The AB qualification was granted for completing the NBC Defence Staff Officer course conducted at CFNBCS Borden. The AB course was 12 weeks long, and has now been replaced by the combination of the Unit NBC Defence Officer Course (AINN) and the Advanced NBC Defence Officer Course (AIOM). The ability to perform NBC Defence warning and reporting has been deleted.

83 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine*…, 4-2-3/4-2-4. The Advanced NBC Defence Officer course "… enables selected officers (Capt/Lt(N) or higher ranks) to perform in positions at command and formation headquarters, and in specified operational units and training establishments, in order to provide NBC Defence expertise and advice to commanders and staffs. Graduates can also provide NBC Defence instruction and command specified NBCD units." Specification tasks include: (1) Manage Formation NBC Defence plans, (2) Develop NBC Defence policies, doctrine and procedures, (3) Manage NBC Defence material, (4) Manage NBC Defence training and readiness, (5) Manage the Formation NBC prediction, warning and reporting system, and (6) Advise commanders and staffs on NBC Defence matters.

Course paper written in 1982, Major B.N. Wright noted some of the disadvantages of the decision made in 1977. He wrote that there were few NBC Defence specialist positions in the CF, and although these officers worked diligently in their subject area, they appeared to be unable to influence commanders, as well as operations and training staffs with regard to NBC Defence requirements and readiness.[84] In addition, he noted some of the personnel problems that were being encountered, specifically that

> Too many service personnel observed in NBC positions entered them at a stage in their careers when prospects for progression were slim or to fulfill a want to serve in an out-of-branch employment. A higher profile organization which tended to enhance careers and offer a more varied scope of activity would attract more personnel at the peaks of their careers and self-generate an ever-improving image.[85]

In accordance with new doctrine, NBC Defence specialist staffs are situated at strategic and operational headquarters, and may be placed in Formation Headquarters as well. This new doctrine notes, however, that at the present time, NBC Defence specialist officers are rarely employed below the strategic-level, and during an operation, augmentation will be required.[86] In fact, all headquarters require the appropriate specialist staff embedded permanently if the CF are to survive on the battlefield or are to assist in the defence of Canada with an NBC Defence incident response capability. The evolving concept that considers Canada as an operational theatre requires full-time NBC Defence specialist expertise in operational-level headquarters to conduct NBC Defence planning, provide

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84 Major B.N. Wright, "A Home for Air Defence and Chemical Warfare Resources," (Toronto: Canadian Forces Command and Staff College Command and Staff course paper, 1982), 12, 16.

85 Ibid., 23.

86 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine*…, 3-8-1 - 3-8-2.

advice, coordinate NBC Defence specialist employment, and supervise NBC Defence activities and training.[87] In addition, NBC Defence specialist officers supervise the command or formation NBC Centre, and the warning and reporting system.

According to doctrine, every level of command above unit level requires an NBC Centre as an integral part of the headquarters.[88] At the tactical level, formations require at least one officer and one NBC Centre operator, as well as support staff for every shift.[89] Typically in an operational-level headquarters, each NBC Centre will require

> . . . a Supervisor/NBCD defence officer (Major), three duty officers (Captain/ Lieutenant) and three shifts of support staff, each with one trained NBCD Centre operator, and a clerk to file and collate all incoming operational information.[90]

NBC Centre personnel are trained on the NBC Centre Operator and the NBC Centre Supervisor courses at CFNBCS. These personnel currently fulfill this function as a secondary duty in various headquarters and rarely have the opportunity to practice their skills and gain experience. The introduction of computer-based systems has almost doubled the training time, while skill retention afterwards is a serious concern. During an NBC or ROTA terrorism event is not the time to have to refer to the Warning and Reporting manual. The

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87 Department of National Defence, NDHQ Instruction DCDS 2/98 *Guidance for the Conduct of Domestic Operations* (Ottawa: DND, July 1998), 3. In the CF, operational-level headquarters consist of the Headquarters of the Joint Operations Group, Maritime Forces Atlantic, Maritime Forces Pacific, 1 Canadian Air Division, Northern Area, and the four Land Force Areas.

88 DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations (draft 2004)*…, 5-2-2 - 5-2-3.

89 Ibid., 5-2-2, 5B-1. A formation NBC Centre "... should consist of two vehicles, three officers, three plotters, and six drivers/signallers.

90 Ibid., 5-2-2.

filling of NBC Defence specialist staffs in command and formation headquarters is critical for survival and success in an NBC environment. At the present time, however, few operational-level and formation headquarters, if any, have the full complement of personnel to fulfill the NBC Defence staff officer and NBC Centre functions. The requirement for an immediate assessment of the hazard during an NBC terrorism or ROTA incident precludes the use of headquarters augmentees. The CF requires the immediate availability of NBC Centre personnel with a high level of expertise.[91] Clearly, the current method of selecting, training and employing NBC Defence staff officers and NBC Centre personnel fails to meet today's requirement.

NBC Response Team

One of the first Response Teams prepared to deal with NBC hazards in Canada was 1 RDU, which was authorized in March 1950. It consisted of Royal Canadian Engineers who were provided specialist training in nuclear and radiological defence. During the short ten-year history of this unit, it participated in survey and decontamination activities after the accidental release of radiological material at Chalk River in 1952 - 1953 and at live nuclear explosions in Australia and the United States. As well, 1 RDU personnel provided nuclear defence instruction at CFNBCS. Eventually the Army transferred responsibility for radiological survey and reconnaissance to armoured reconnaissance squadrons, and 1 RDU was disbanded in 1960.[92]

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91 DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine* …, 3-2-1.

92 Holmes, *The History of the Canadian Military Engineers: Volume III* ..., 261-264.

The CF has maintained an NBC Defence counter-terrorism capability since 1976. As a result of the terrorist attack at the 1972 Olympic Games, CFNBCS, with support from Canadian Forces Base Borden, was tasked with providing a Nuclear Biological Chemical Response Team (NBCRT) for the 1976 Olympic Games in Montreal. Following the Games, CFNBCS was tasked to maintain this NBC incident response capability. In 1992, full cooperation with the RCMP Explosive Disposal and Technology Section commenced in accordance with the National Counter-Terrorism Plan. Over time, forensic evidence specialists from the RCMP and a portable Level Four laboratory from Health Canada were added to the team.[93]

The mission of the NBCRT was to respond to terrorist CBRN threats or the use of CBRN agents anywhere in Canada. The team had specialist NBC Defence equipment and was tasked with providing expert advice to the civil authorities, neutralizing NBC dispersal devices, sampling to identify hazards, forensic evidence collection, and limited site decontamination. The NBCRT, however, could only provide personnel decontamination and medical treatment for its own personnel. It only had the ability to respond to one incident at a time, and any deployment of the NBCRT required the cancellation of CFNBCS courses, as the School staff comprised all the specialists. Nevertheless, CFNBCS benefited from this dual role as the staff members were provided with additional training and experience that was incorporated into NBC Defence instruction.[94] The changing threat after 2001 required the

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[93] Department of National Defence, "CFNBCS History," http://borden.mil.ca/cfnbcs/English/about_cfnbcs/nbc_history/nbc_history_e.asp; Internet; accessed 20 October 2004.

[94] Personal experience as Commanding Officer of the NBCRT (July 2002 - January 2003) and Commandant CFNBCS 2002 - 2004.

frequent deployment of the NBCRT to planned activities throughout Canada. At the same time, CFNBCS' resources were overextended by the increasing demands for NBC Defence instruction by CF organizations and other Government Departments. Over the years, the conflicting priorities between NBC Defence instruction and a counter-terrorism response capability have prompted many recommendations to re-evaluate the dual roles of CFNBCS and create a separate NBCRT.

Joint NBC Defence Company

Recognizing the requirement for a more robust NBC Defence specialist capability in the CF, the National Military Support Capability project included an NBC Defence specialist unit within the Joint Support Group. At a working group meeting in January 2001, an NBC Defence Battalion was designed to provide NBCD GS for the deployment of the Main Contingency Force (MCF).[95] After further development, the Battalion was configured to include a Headquarters, and Reconnaissance and Surveillance, Decontamination, Collective Protection, and Administrative Companies, with a total strength of 531 members. As a subset of this unit, a composite company structure was created to support the vanguard of the MCF.[96]

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[95] DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations (draft 2004)*…, 3-1-1. "The 1994 Defence White Paper specifies that the CF be able to deploy, or re-deploy from other multilateral operations, a joint task force headquarters and, as single units or in combination, one or more of the following elements: (1) a naval task group, comprised of up to four combatants (destroyers, frigates or submarines) and a support ship, with appropriate maritime air support, (2) three separate battle groups or a brigade group (comprised of three infantry battalions, an armoured regiment and an artillery regiment, with appropriate combat support and combat service support); (3) a wing of fighter aircraft, with appropriate support; and (4) one squadron of tactical transport aircraft."

[96] Ibid., 3-5-1 - 3-5-3.

The fact remains, however, that while the *Canadian Forces Nuclear Biological Chemical Defence Operations* manual indicates that a specialist NBC Defence Battalion is required to support the MCF, these trained personnel do not exist within the CF. The Joint NBCD Coy can only fill 20 per cent of this unit, but a substantial portion of it must be retained in Canada to provide a counter-terrorism response. Other dedicated NBCD CS and GS units do not exist in the CF organization, nor are there sufficient NBC Defence specialists filling positions throughout the CF. While it is anticipated that there will be a six-month warning time prior to the deployment of the MCF, the training capacity of CFNBCS is not sufficient to prepare the required number of NBC Defence specialists over that time period. Measures, therefore, need to be taken now to ensure that there are always sufficient NBC Defence specialists available within the CF.

Following the terrorist attacks on the United States in 2001, and concern over the potential use of NBC weapons by terrorists, the Government of Canada began placing a greater emphasis on NBC counter-terrorism and NBC Defence within the CF. In November 2001 the Standing Committee on National Defence and Veterans Affairs recommended that the number of personnel in the NBCRT be increased.[97] The federal budget in December 2001 allocated funding to separate the domestic counter-terrorism responsibility from CFNBCS and create a full-time NBC counter-terrorism unit. The doctrinal NBC Defence

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[97] House of Commons, *State of Readiness of the Canadian Forces: Response to the Terrorist Threat*, David Pratt, MP, Chairman Standing Committee on the National Defence and Veterans Affairs, (Ottawa: House of Commons, November 2001), 12.

Company, created as part of the National Military Support Capability project, was modified to form the structural basis of the new Joint NBCD Coy.[98]

The new Joint NBCD Coy was formed at Trenton in the summer of 2002 as a DCDS unit. The role of the Company is to provide NBCD GS in support of domestic CBRN counter-terrorism operations, CF deployed operations, and routine CF activities. The requirement to replace CFNBCS as the CF contribution to the National CBRN Response Team was met at the end of 2002. An enhanced domestic response capability was achieved at the end of 2003, at which time command and control of the Company was delegated to the Joint Operations Group in Kingston. The final operating capability of the Joint NBCD Coy was reached in March 2005.[99]

The Joint NBCD Coy is now capable of performing the majority of NBC Defence specialist functions, with the exception of clearance decontamination, collective protection, CBRN ordnance disposal, and deployable laboratory facilities. It can provide a dedicated domestic response at two incident sites simultaneously, and must be prepared to provide NBCD GS for theatre activation and the initial rotation on international operations. The sheer scope of the Company's responsibilities, equipment maintenance and training requirements, and increased demands from CF formations for the Company's participation on exercises, has brought to the forefront the fact that the Company is not sufficiently

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98 Department of National Defence, *Statement of Operational Requirement: NBC Defence Services Project* (Ottawa: DND, 28 November 2002), 1-2.

99 Major Ian MacVicar, "Joint NBCD Company" (lecture, Command and Staff Course 31, 25 November 2004).

manned to effectively fulfill all of its assigned tasks. Steps are being taken to increase the Company strength in the near future to about 150 members. Understanding the physical limitation to the Company's ability to respond to CBRN incidents across the country, DNBCD also submitted a proposal to the DCDS in September 2003 for the creation of two additional NBC Defence companies (one in the East and one in the West), with a Battalion Headquarters in Kingston, although no further staffing has occurred.[100]

The Joint NBCD Coy has faced many challenges over the past three years. Of significance has been the impact of the lack of NBC Defence experience by those members posted into the unit. This was largely due to the lack of NBC Defence specialists in the CF. The Joint NBCD Coy maintains elements at high levels of readiness to respond to domestic CBRN incidents, yet several of the Joint NBCD Coy members posted to the unit were unprepared for these demands. An NBC Defence occupation would ensure that members posted into the Company were properly trained and prepared to function in it. The second concern has been the weak skill retention, particularly with regard to the operation of sophisticated equipment. DNBCD is in the midst of a number of projects that will replace existing NBC Defence equipment and introduce new capabilities. Additional equipment is being specifically provided for NBCD GS elements, including: weather stations, air quality monitors, sampling kits, decontamination shelters, Hapsite chemical identification systems, biological detectors, hazard prediction and assessment software, NBC reconnaissance vehicles, and unmanned ground vehicles to provide an NBC standoff detection and identification capability. DNBCD has recognized that "This equipment is usually complex

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[100] Major Peter Harbert, *Briefing Note for Special Assistant DCDS: Canadian Forces Nuclear Biological and Chemical Defence Capability* (NDHQ DCDS, 24 September 2003), 1.

and requires extensive user training to operate and interpret results."[101] The CRS study noted that "NBCD skills are perishable and if not practiced on a consistent basis can be lost."[102] The solution requires more in-depth training and additional practice time on the formal CFNBCS courses, followed by the opportunity to continually practice these skills under supervision within an NBCD specialist unit. It is, therefore, inconceivable that commanders should expect other personnel to be able to perform NBCD GS or CS functions as a secondary duty. The CF requires NBC Defence specialists who are totally familiar with their equipment and procedures to fulfill NBCD GS or CS functions.

Land Force NBC Defence Specialists

The Land Force does not have a robust NBCD CS capability that could be used during international and domestic operations. The Army must be prepared to assist local authorities in response to NBC terrorist or ROTA events. It must also be able to augment the Joint NBCD Coy, and provide NBCD CS and NBCD GS functions during subsequent deployment rotations. Within the Army, NBCD CS responsibilities are split between a variety of corps and units. Specifically, the brigade reconnaissance squadrons have a secondary task of NBC reconnaissance, while brigade military police platoons are tasked to conduct NBC reconnaissance and surveillance along routes as part of their normal duties. The Logistics Branch and service battalions are responsible for thorough decontamination, and engineers are responsible for supporting thorough decontamination and providing collective protection.

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[101] Department of National Defence, B-GJ-005-311/FP-040 *Canadian Forces Nuclear, Biological and Chemical Defence Equipment (final).* (Ottawa: DND, October 2004), iii/iv.

[102] DND, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II …*, 39.

As part of the Government's initiative to enhance the NBC Defence within the CF, the Army is developing an NBC Defence capability within the Reserve Force. Land Force Central Area is developing a CBRN collective protection organization, while Secteur du Québec de la Force terrestre is creating an NBC reconnaissance sub-unit. The Army intends to establish five to six company-sized elements to fulfill its NBCD CS requirements by 2007/2008.[103] As with any Reserve unit, they will be dependent upon the experience and expertise of those Regular Force members assigned to support them. If they are to be of any value to the reserve units, these Regular Force members should be experienced NBC Defence specialists, not individuals who are performing the NBC Defence specialist function as a temporary assignment. One of the concepts being considered is the establishment of NBC Defence specialist sub-units in existing reserve units. It is not the aim of this paper to discuss the validity of this concept, however considering the difficulties that the Joint NBCD Coy is encountering with skill retention, it is unlikely that reserve members will be able to remain proficient in their NBC Defence specialist skills, let alone their original occupation. Centralizing NBC Defence specialists in several units across the country and the creation of an NBC Defence specialist occupation within the Reserve Force would go a long way to resolving this problem.

Within the Regular Force, the realignment of the Army service support capabilities during the 1990s created separate service battalions in brigades and general support

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[103] Department of National Defence, *Army Chemical Biological Radiological and Nuclear (CBRN) Defence Capability* (CLS: file 1901-6-6 (CLS), 18 November 2003), M-1/11 - M-2/11.

Paul Mooney, "Army Reserve to develop new capabilities," *News Headlines*, 31 March 2004, available at http://www.army.forces.gc.ca/lf/English/6_1_1.asp?id=166; Internet; accessed 10 January 2005.

battalions in Land Force Areas. With this change the Army's thorough decontamination capability was assigned to the general support battalions. Over the years, it has received varying emphasis, depending on the Commanding Officer and the operations assigned to the unit. The current restructuring plan is to establish one large service battalion in each Area that would include a 16-person decontamination platoon. This provides the opportunity to determine the primary function of these individuals. Should they be service support trades who perform the complex task of thorough decontamination as a secondary function with no formal training? Or should they be NBC Defence specialists who are ready to respond to an NBC event at any time, and perhaps work as drivers in the service battalion as a secondary duty? It would appear that the NBC Defence specialist role is much more technical and subject to skill retention challenges than performing some of the service support functions. Employing NBC Defence specialists in this role would definitely provide a substantial boost to the Army decontamination capability. Overall, the Army's NBCD CS capability is hampered by the decentralization of responsibilities and tasks without centralized control and a definite concept of operations. As result, there is no centre of expertise, a lack of synergy between the NBC Defence components, redundant training when it occurs, and the adoption of unit-specific procedures.

Air Force NBC Defence Specialists

NBC Defence responsibilities in the Air Force are split among the Aerospace Controller and Airfield Engineer occupations, with the former providing the Wing NBC Defence Officers and NBC Centre operations, while the latter conduct the actual protection, reconnaissance, and decontamination tasks. There are two initiatives underway with regard

to NBC Defence, one dealing with the NBC Defence personnel readiness of air force personnel, and the other with the creation of an air force NBCD CS capability.

In March 2004, the Air Staff released a plan to create enhanced Readiness Training Flights (RTFs) to improve the readiness at the Wings of 1 Canadian Air Division. These Wing RTFs will provide refresher training for domestic and international operations, including training on military first aid, NBC Defence, land navigation, communications, small arms, and the Law of Armed Conflict. [104] In accordance with this plan, Wing positions for both NBC Defence training and operational response capabilities will be combined in the RTFs. The personnel requirement for the RTFs is identified in the document as 40 Regular Force personnel and 111 Reservists, as well as five Civilian positions.[105] These RTFs have a requirement for extensive and up-to-date NBC Defence subject matter expertise to instruct and provide an incident response component. NBC Defence specialists are required for this task, rather than personnel from other occupations who are performing NBC Defence functions as secondary employment. These NBC Defence specialists could also be employed instructing the other activities, such as first aid, navigation, communications, small arms, and the Law of Armed Conflict.[106]

The Air Force has realized that it has insufficient NBC Defence specialists, and is lacking NBCD CS resources that can be deployed when required. This was apparent by the

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104 Department of National Defence, Chief of the Air Staff, *Master Implementation Plan for the Implementation of Enhanced Wing Readiness Training Flights (RTFs) (draft)* (Ottawa: DND Canada, 2004), 1-3/5, 4-1/6.

105 Ibid., vii.

106 Ibid., v, 4-3/6.

poor showing during the tactical evaluation at Bagotville, Quebec, in the fall of 2004. As such, the Air Force intends to create an NBCD CS capability among its Wings that can be brought together and deployed overseas or to a base in Canada as required. This would provide additional positions for NBC Defence specialists within the Air Force and greatly enhance its NBC Defence posture.

Maritime NBC Defence Specialists

Within Maritime Command, the only operational NBC Defence specialist organizations are two Nuclear Emergency Response (NER) teams. While ships have no NBC Defence specialists on board, each has an integral NBC Defence capability. There are NBC Defence staff officers in formation headquarters, as well as NBC Defence training staffs located in schools on both coasts. The Navy has recently moved to assign unit NBC Defence responsibilities to the Naval Combat Information Operator occupation.[107]

Nuclear-propelled vessels (NPV) or nuclear-capable vessels (NCV) occasionally visit Halifax and Esquimalt, as well as the training area at Nanoose Bay off Vancouver Island. The CF maintains NER teams in Halifax and Esquimalt that are prepared to deal with possible incidents during these visits, and the Joint NBCD Coy can also assist. In addition to contingency planning and coordination, NER activities include dockside monitoring during NPV/NCV visits, and in the case of an incident, the provision of specialist advice, radiological reconnaissance, survey, and decontamination. The NER teams consist of five or six full-time personnel who form the core element and are responsible for preparing the NER

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[107] DND, *CRS Evaluation of Nuclear Biological and Chemical Defence*, 42.

plans, coordination and liaison, as well as training the twenty or so base augmentees that form the remainder of the team. NBC Defence specialist and technical officers in Halifax and Esquimalt and their corresponding formation headquarters support the NER teams. Formal training is provided by the NER Radiation Monitor and NER Management courses, while the Technical Adviser holds a related post-graduate degree.[108]

CFNBCS and NBC Defence Training

NBC Defence specialists are also required in NBC Defence training establishments. During the First World War, anti-gas training was an essential element of survival. The Division Gas Officers were initially trained in the British Army gas schools. They, in turn, organized divisional gas schools to train the division's officers and NCOs.[109] Eventually a Canadian Corps gas school was opened in July 1917 to standardize training across the Corps.[110] The officers selected to fulfill the Gas Officer duties were those with Applied Science training and experience in the chemical, electrical and mechanical fields. These Gas Officers faced a difficult and unrewarding job training the officers and men in the hazards associated with gas warfare. Their efforts, however, saved countless lives and preserved the fighting integrity of the Canadian Corps.[111]

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[108] Canadian Forces Nuclear Biological Chemical School, "NER Organization and Operations" (Nuclear Emergency Response Management Course 0203, Module 8, Trenton, ON, March 2003). The Halifax NER Team permanent staff consists of one officer as the NER officer (NERO), one officer as the Scientific and Technical Adviser (STA) and four Senior NCOs. The full-time Esquimalt NER Team consists of the NERO, STA, and five Senior NCOs. The Esquimalt NER team is also responsible for the Nanoose Bay training range.

[109] Cook, *No Place to Run*…, 72.

[110] Bailliu, "Canada and Chemical Warfare"…, 65.

[111] Cook, *No Place to Run*…, 67-68, 72.

Today, formal individual training for joint NBC Defence, nuclear emergency response and radiation safety is conducted at CFNBCS under the direction of the Canadian Forces Support Training Group.[112] Joint individual training may be categorized into four groups: unit NBC Defence training that supports integral NBC Defence, NBC Defence staff officer training, NBC Defence specialist training, and radiation safety and NER training. A Training Needs Assessment initiated as part of the Joint NBCD Coy project noted that existing courses at CFNBCS did not meet the needs of the Company, and by deduction, those of other organizations with a specialist NBC Defence role.[113] As a result, a number of NBC Defence specialist courses were developed by CFNBCS in 2003 - 2004. In addition to the Advanced NBC Defence Officer course, nine other NBC Defence specialist courses, as depicted in Table 1, are now being conducted at CFNBCS.

Table 1 - NBC Defence Specialist Courses at CFNBCS[114]

Course	Student Rank	Course Length
Basic NBC Defence Specialist	Private - Sergeant	2 weeks
NBC Reconnaissance Specialist (Note 1)	Private - Sergeant	4 weeks
NBC Surveillance Specialist (1)	Private - Sergeant	4 weeks
NBC Decontamination Specialist (1)	Private - Sergeant	3 weeks
NBC Centre Operator	Private - Sergeant	4 weeks
NBC Centre Supervisor (2)	Warrant Officers and Officers	2 weeks

[112] Canadian Forces Nuclear Biological Chemical School, "CFNBCS History." In September 1940, the Canadian Army founded No. 1 Canadian Chemical Warfare Defence Laboratory in Suffield, Alberta. In 1942, it was renamed the Chemical Warfare Training Centre and then the Canadian Chemical Warfare School before being disbanded on 24 June 1944. With the commencement of the Cold War in 1949, an Atomic, Biological and Chemical Warfare Wing was created in the Royal Canadian Army Medical Corps School at Borden. On 28 January 1954, a separate Joint Atomic, Biological and Chemical Defensive Warfare School was created. In 1966, as part of CF restructuring, it was renamed the Canadian Forces Nuclear, Biological and Chemical Warfare School and in 1970, "Warfare" was dropped from the school name.

[113] Department of National Defence, *Nuclear Biological Chemical Defence Services Project: Needs Assessment for Joint NBC Defence Company* (Ottawa: DND, October 2002), iii-iv.

[114] DND, B-GJ-005-311/FP-000 *Nuclear Biological Chemical Defence Strategic Doctrine …*, 4-2-2 - 4-2-3/4-2-4.

NBC Reconnaissance Leader (2)	Warrant Officers and Officers	4 weeks
NBC Surveillance Leader (2)	Warrant Officers and Officers	4 weeks
NBC Decontamination Leader (2)	Warrant Officers and Officers	3 weeks
Advanced NBC Defence Officer (2)	Captain and above	7 weeks
Notes. (1) Prerequisite is the Basic NBC Defence Specialist course or the Unit NBC Defence Instructor course. (2) Prerequisite is the Unit NBC Defence Officer course.		

Based on the doctrinal requirement for NBC Defence personnel in the CF at both the unit and formation levels, insufficient personnel are being trained to ensure an adequate level of readiness. NBC Defence training for all personnel can be completed as refresher training during pre-deployment preparation, but units normally lack sufficient numbers of unit NBC Defence instructors and NBC Centre operators as their training is not seen as a priority. When these personnel are needed, there is usually a frantic attempt to arrange extra courses at CFNBCS. Because the requirement has not been adequately articulated and positions correctly annotated to require the qualifications, with the exception of the Joint NBCD Coy, CFNBCS, and NER teams, NBC Defence specialist training is not promoted and enforced. In the Fall of 2004, when CFNBCS started conducting the new NBC Defence specialist courses, few members of the organizations charged with providing Army, Air Force and Navy NBCD CS functions attended. At the present time, unit and formation commanders have the freedom to employ whom they want in NBC Defence staff positions and on NBC Defence GS and CS tasks, or no one at all. Frequently NBC Defence specialist requirements are ignored, or unqualified personnel are assigned. This is similar to the lack of priority noted by LCol Bailliu in 1989,

> It remains that today, the western military establishment does not favour the waging of any type of chemical warfare . . . . They may even profess their distain for such warfare by neglecting, if not rejecting outright, the

> requirement to train in chemical warfare to achieve an adequate level of proficiency in efficient defensive measures.[115]

The creation of NBC Defence specialist occupations and the assignment of those personnel to command and formation headquarters, as well as to units with NBCD CS and GS tasks, would remedy the neglect of this critical capability and ensure that formations are prepared to survive and operate in an NBC environment.

1987 NBC Defence Occupation Study

Since 1969, numerous studies have been conducted and papers written on NBC Defence readiness within the CF, and most have recommended the formation of a separate occupation. In September 1987, the Director of Nuclear Biological Chemical Coordination (DNBCC),[116] LCol W.R. Johnston, circulated a proposal entitled *Employment of NBC Staff Officers (ASQ AB)*. This proposal was designed to correct weaknesses and improve NBC Defence within the CF by incorporating NBC Defence staff officers into the occupational structure. The study paper identified that there was not ". . . a viable NBC specialist element within the CF to provide the necessary expertise and advice in NBC related matters."[117] DNBCC's paper bluntly stated that the CF was not meeting its NBC Defence policy commitments, nor was it properly preparing its military personnel to operate in an NBC environment. The primary cause of the disintegration of NBC capability within the CF was described as the mismanagement of NBC staff officers that resulted in the erosion of NBC

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115 Bailliu, "Canada and Chemical Warfare"…, 4.

116 The position is now titled Director Nuclear Biological Chemical Defence (DNBCD).

117 Johnston, *Employment of NBC Staff Officers* …, 1.

Defence expertise.[118] LCol Johnston's study reviewed the number of NBC Defence staff officer positions within the CF, as well as the status of qualified NBC Defence staff officers to fill those positions. Based on 1986 data from the Director Personnel Information Services, a total of 80 officers in the CF possessed the NBC Defence Staff Officer (AB) qualification, yet only 25 of the 59 positions requiring it were filled by qualified officers (see Table A-1 of Annex A). The paper analysed the requirements and came to the conclusion that some positions were not required. It also noted, however, that another 24 positions actually required the AB qualification for a total of 57 NBC Defence staff officer positions (see Table A-2 of Annex A).[119]

As LCol Johnston noted, the selection and employment of NBC staff officers was given very little emphasis by Commanders and Career Managers. It was his contention that Career Managers normally filled occupation positions that they considered essential before considering generic positions requiring NBC Defence qualified officers. In addition, individuals resisted NBC Defence specialist positions and remained for a short period of time in them, as "Such a posting was considered to have a detrimental effect on career progression."[120] The paper identified that one of the main stumbling blocks was that NBC Defence was often a secondary duty and, therefore, not a high priority for commanders and staff. Non-qualified officers, as a result, filled many NBC Defence staff officer positions.[121] Recognizing that the resultant erosion of expertise would continue without a significant

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118 Ibid., 2.

119 Ibid., 9, A-3.

120 Ibid., 2.

121 Ibid., 1, 7.

change in the perception and management of NBC Defence staff officers, LCol Johnston proposed three options to improve the management of NBC Defence specialists.

The first option maintained the status quo with officers receiving NBC staff officer training as necessary and filling NBC defence specialist positions on a temporary basis. There were no real advantages to this option, other than providing Career Managers and Commanders with the opportunity to fill NBC Defence positions with any available officer, instead of properly qualified and experienced officers. The disadvantage identified was the continual erosion of NBC Defence expertise, as officers temporarily served their time in NBC Defence positions before returning to their initial career path.[122]

The second option proposed a new military occupation for NBC Defence staff officers that would provide career progression for a core of officers who would continually improve their knowledge and expertise in NBC matters. This knowledge could then provide expert advice to commanders and staffs, and NBC Defence training and equipment acquisition would be enhanced. The major difficulties with this option were the size of the proposed occupation and the one-to-one ratio of Captains to Majors in the proposed NBC Defence specialist positions.[123]

The third option proposed increasing the number of qualified NBC Defence staff officers, and providing a better framework for managing their employment. This proposal

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[122] Ibid., 9-11.

[123] Ibid., 11-13. This refers to those officers employed as NBC Defence staff officers and training officers employed in Command and Formation headquarters and specialist NBC Defence training and operational units.

included the possibility of extended tour lengths and subsequent NBC Defence postings, but did not entail changes to the occupation structure or training methodology. LCol Johnston deemed that the rotation of officers between their original occupation and NBC Defence would be satisfactory to ensure the officers remained current in both fields and would remain competitive for promotion. At the same time, NBC Defence expertise and credibility would be enhanced, as well as instructional quality at CFNBCS. The disadvantage of this proposal was the requirement for an efficient system to monitor and develop officers for more senior NBC Defence positions, and convincing Career Managers and branch advisers of the necessity to develop NBC expertise and manage it as a viable specialty.[124]

With regard to the 1987 DNBCC proposal, the creation of an NBC Defence occupation was not adopted due to a Combat Arms Occupational Analysis being conducted at the time, and the perception that there was not a sufficient manning requirement to form a critical mass of personnel for an occupation. The third option was adopted to permit greater flexibility and management in the employment of NBC Defence specialist officers.

Current NBC Defence Specialist Manning

In the 18 years since the study addressed by LCol Johnston, how successful has the CF been at adopting his third option in order to enhance NBC Defence expertise? Today, there exists a small group of experienced and dedicated NBC Defence officers who willingly rotate between the NBC Defence specialist positions, and take a personal interest in enhancing NBC Defence readiness within the CF. There are also a number of others who are

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[124] Ibid., 7.

assigned, willing or not, to fill NBC Defence staff positions by their Career Managers, and do so for short periods of time. There are still, however, insufficient numbers of NBC Defence specialists to fulfill the actual requirements of the CF. The 2001 Chief of Review Services (CRS) evaluation of NBC Defence indicated that some commanders are ignoring directives, not conducting NBC defence training, nor sending personnel to receive training. As a result, the requirements are ignored, or unqualified officers are assigned to fill NBC Defence specialist billets, especially at the higher rank levels.[125]

A key intention of the 1987 study was to provide better management in the employment of NBC Defence specialists. Prior to the commencement of new NBC Defence specialist courses at CFNBCS in 2004, NBC Defence specialist officers were only trained on the Advanced NBC Defence Officer (AIOM) course. Based on information obtained from the CF Human Resources Information Centre in October 2004, only 46 positions in the CF require the AIOM qualification (see Table B-1 in Annex B).[126] There are currently 61 officers with the AIOM qualification, yet data indicates that only 11 positions are filled with qualified officers (see Table B-2).[127] Most NBC Defence staff officers will be able to look at these lists in Annex B and determine that they are out of date and do not reflect the actual employment of qualified NBC Defence Staff Officers. An analysis of these figures indicates that there are some positions that do not require the AIOM qualification and do not need to

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125 DND, CRS Evaluation of Nuclear Biological and Chemical Defence Volume II …, 40-43.

126 Department of National Defence, "ADHOC Report Request 90247: Status of Positions Requiring the Advanced NBC Defence Officer Qualification," (Ottawa: DND Human Resource Information Centre, 11 October 2004), 1.

127 Ibid., 2-3. Qualified AIOM personnel as of October 2004 included: Col/Capt(N) - 3, LCol/Cdr - 5, Maj/LCdr - 21, Capt/Lt(N) - 32, and MWO/CPO2 - 1.

be filled by NBC Defence specialist officers. On the other hand, there are numerous positions that should be annotated for NBC Defence specialist officers in order to meet the operational requirements of the CF. Table B-1 is missing numerous positions in DNBCD, the Joint Operations Group, most Land Force brigades and Area headquarters, most of the Wings in 1 Canadian Air Division, and the new Joint NBCD Coy. This is a clear indication that NBC Defence specialists are not being adequately managed.

Another key intention of the third option in the 1987 study was to eliminate the notion that an NBC Defence specialist appointment would hinder career advancement. This has not occurred. The CRS noted in 2001 that "There is an almost universal perception across the CF that specialist involvement with NBCD is career limiting."[128] This perception is not just among the NBC Defence specialists, but exists within the leadership and rank and file of the CF. Personnel employed as NBC Defence specialists are outside the mainstream of their original occupation.[129] They tend to be isolated from their branch leadership and they lack the opportunity to gain experience and retain their occupational skills and knowledge. In addition, they need to adapt to a highly technical field with little opportunity to gain NBC Defence experience. These specialists must provide advice to formation commanders in a subject field that most commanders tend to dread, ignore because it is inconvenient, and perceive to be "low-profile". As a result, they cannot compete with their peers for promotion. Using CFNBCS as an example of an organization consisting of NBC Defence specialists, of the 63 officers and NCMs who served as staff between 1997 and

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128 DND, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II*…, 41.

129 Ibid., 44.

2004, only six were promoted, an average annual promotion rate of 1.1 percent. In addition, with regard to the same 63 personnel, only two were promoted within two years of leaving CFNBCS. The average promotion rate in 2004 for the CF was over 14 percent for officers and over 16 percent for NCMs.[130] It's clear that NBC Defence specialist appointments continue to be detrimental to career progression.

With this perception of NBC Defence assignments within the CF, few volunteer for them, and Career Managers have to select individuals to fill these jobs, often against their wishes. With regard to filling NBC Defence specialist positions, the CRS found that ". . . no set of specific criteria is used to select individuals for specialist NBCD training."[131] The selection of instructors for CFNBCS and other establishments where NBC Defence training is conducted is critical for success.[132] In each of their annual reports between 1990 and 1995, the DND Biological Chemical Defence Review Committee (BCDRC) recommended that CFNBCS should have more staff with scientific or engineering backgrounds.[133] It does not appear that this recommendation has been factored into postings to CFNBCS or to the Company. NBC Defence specialist positions are instead filled in a haphazard manner. The

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130 Department of National Defence, "ADHOC Report Request 94360: CFNBCS Personnel Information," (Ottawa: DND Human Resource Information Centre, 2 February 2005). 41 NCMs and 22 officers served in CFNBCS during this time period, and two NCMs and four officers were promoted.

131 DND, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II*…, 40.

132 Cook, *No Place to Run* …, 116. This was a lesson that the Canadian Expeditionary Force had to learn during the First World War, when difficulties with anti-gas defences was attributed to the quality, and in some cases, lack of gas training provided by the Gas Officers in France and in the Reinforcement Depots in England. Tim Cook noted that the NBC Defence instructors "... were generally unfit for active service and did not have the energy, drive or knowledge to encourage an interest in the important yet seemingly mundane aspects of anti-gas discipline."

133 Department of National Defence, *Review of the Chemical and Biological Defence Program* (Ottawa: DND, 1990-1995). The BCDRC is responsible for the annual review of the CF's chemical and biological research, development and training programs.

Career Manager finds an individual who has either a real interest in the NBC Defence field, or who will take any position in that geographical area. Failing to find an interested individual, the Career Manager is likely to fill the position with someone for which the assignment will have little impact because they are not in the mainstream of the occupation.[134] While attempting to coordinate personnel changes in 2002, the Commandant of CFNBCS was informed by one Career Manager that the "good" personnel were going into "hard" occupation positions and the school would get one of the "others."[135] In 2003, a Directorate of Army Doctrine briefing note for J3 Engineers on the status of NBC Defence stated, with regard to the manning of current NBC Defence positions,

> Personnel employed in NBC are often assigned because of convenience and in some cases because they are seen as having lesser potential in their primary employment. Indeed, in either case employment in NBC can be career ending. Thus, it is not uncommon for individuals to lobby hard to move out of NBC employment as soon as they can. The result is a continuous drain on NBC expertise.[136]

As for maintaining expertise in the CF, the CRS Evaluation Team noted that rarely do NBC Defence specialists occupy NBC Defence positions more than once, and "As a result, most CF members posted into NBCD positions lack the proper NBCD specialist qualifications."[137] CFNBCS has 21 military positions, which are filled by 16 different trades, making it close to impossible to build and maintain any level of experience and expertise. Of

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134 This is not applicable to the Fire Fighters in the Joint NBCD Coy, given the large number posted to that unit.

135 Personal experience of the author as Commandant of CFNBCS 2002 - 2004.

136 Major Don Dubois, *Briefing Note for J3 Engineer: Nuclear Biological Chemical Defence (NBCD)* (Directorate of Army Doctrine, 16 July 2003), 3.

137 DND, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II*…, 40.

the 63 staff members at CFNBCS during 1997 - 2004, only three members were employed for a second time at CFNBCS, and the vast majority of instructors and supervisors had to be trained after arrival.[138] This, despite the BCDRC recommendation that career management procedures need to take into consideration the requirements of small technically-oriented schools such as CFNBCS.[139] At the NBC Defence Training Steering Committee meeting in 2003, the Commandant of CFNBCS indicated that in fiscal year 2002 - 2003, 82 staff-weeks had been spent on instructor training (the equivalent of at least two instructor-years), and more than 100 weeks of training were programmed for 2004 - 2005.[140]

The shortage of NBC Defence specialist officers and the lack of an adequate selection criteria identified by the CRS are illustrated by the fact that the newly selected commanding officers of both the Joint NBCD Coy and CFNBCS have no NBC Defence specialist training. In most organizations, the commanding officer is the most experienced officer, but this does not seem to be a consideration when it comes to NBC Defence. Presently, there are three Colonels who are qualified as NBC Defence staff officers in the CF, yet none are employed as DNBCD, a Colonel's position. Five LCols are currently qualified as NBC Defence staff officers, yet only one LCol is occupying an NBC Defence appointment.[141] As the CRS noted in 2001, there ". . . is no recognized career path for NBCD specialists."[142] Unqualified

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138 DND, ADHOC Report Request 94360.

139 DND, *Review of the Chemical and Biological Defence Program.* (Ottawa: DND, 1990-1995).

140 Department of National Defence, *Record of Decisions - CFNBCS Training Steering Committee Meeting - 2 December 2003* (CFSTG file 1180-0870 (CI CFNBCS), March 2004), Annex B.

141 DND, ADHOC Report Request 90247…, 1-3.

142 DND, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II*…, 41.

personnel or NBC Defence specialists without previous experience still fill many NBC Defence specialist jobs in operational and strategic-level headquarters. It is rare indeed to find a Major or Warrant Officer filling an NBC Defence specialist position after becoming an NBC Defence specialist at a lower rank.

The establishment of the Company in 2002 may provide some additional expertise with cross postings to CFNBCS and other NBC Defence assignments. As long as NBC Defence specialists have to compete with their occupational peers, however, there will be little desire to remain in the NBC Defence field if they wish to maintain their career progression. The CF has always been subject to a continual drain of NBC Defence expertise. The CRS came to the conclusion that "A commitment to employ knowledgeable personnel more than once during a career in such specialized spheres would pay dividends in the levels of expertise available to the CF and the overall preparation of the military to respond to threats."[143]

Conclusion

The greater emphasis on NBC Defence readiness in the CF, as well as the creation of the Joint NBCD Coy and other initiatives, has resulted in an increased demand for NBC Defence specialists with a higher level of knowledge and skills than what was previously taught by CFNBCS. Commanders and staffs, however, are not ensuring NBC Defence specialist positions are identified and filled with qualified personnel. There is also a shortage of trained NBC Defence staff officers who can plan and advise on the employment of the

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[143] Ibid., 44.

NBC Defence specialist organizations. As numerous studies have indicated, NBC Defence appointments are not generally sought because they are perceived to be career-restricting. There is no adequate method of selecting and managing NBC Defence specialists. As a result, there is no definitive means of benefiting from their experience due to the continual loss of NBC Defence specialist expertise when the personnel return to their original occupations. While new NBC Defence specialist courses have been initiated by CFNBCS, they are not being utilized effectively. The most effective means of training officers and NCMs is through experience in an actual NBC Defence specialist organization. A recognized occupation would also have a branch advisor with influence over the filling of NBC Defence specialist positions with the right individuals. According to Major Dubois of the Canadian Directorate of Army Doctrine,

> While none of these issues are perhaps compelling in themselves, it is perhaps the absence of an actual NBCD attack that has precluded raising many of these issues to higher levels. Similarly, while current NBCD structures and practices would appear to be performing adequately, they are not performing to their full potential and not to a level that is sufficient to respond to an asymmetric terrorist-like attack.[144]

Clearly the current ad-hoc method of managing NBC Defence specialists in the CF will not effectively provide the quantity and quality required. The requirement for NBC Defence Specialist occupations for officers and NCMs needs to be investigated.

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[144] Dubois, *Nuclear Biological Chemical Defence* …, 4.

Chapter 4 - Foreign NBC Defence Specialists

> [Our] Allies devote more resources and do more training in NBCD than does the CF.
>
> Chief of Review Services, 2001[145]

Introduction

The last five years have seen great improvements in NBC Defence capabilities around the world in response to the growing proliferation of NBC hazards and potential terrorist use. Most of Canada's allies have created or increased the size of their NBC Defence specialist organizations. Moreover, they have followed a variety of methods to create or enhance this capability. For instance, a growing number of countries within NATO have a separate NBC Defence specialist corps or occupation with the requisite training and equipment. Many assign the NBC Defence specialist responsibility to a specific branch or corps, while others take an all-arms approach. The CF has adopted a combination of branch responsibilities and individual assignments. This chapter will look at the NBC Defence structure of a number of other countries in order to determine the benefits available to them based on how they manage their NBC Defence specialist personnel.

Growth in NBC Defence Specialists

As described in Chapter 2, the growing threat of NBC hazards has led many countries to improve their NBC Defence proficiency. Like Canada, many have created new NBC Defence specialist capabilities, primarily counter-terrorism focused, to meet the current NBC threat. For instance, Australia converted an engineer regiment to an Incident Response

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[145] DND, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II …*, 44.

Regiment with explosive ordnance disposal (EOD) and NBC Defence response capabilities prior to the 2000 Olympic Games. To support combat operations, the United Kingdom created the Joint NBC Regiment in 1999. In addition, Austria, Belgium, Brazil, Denmark, Israel, Latvia, the Netherlands, Slovakia, and Sweden now have NBC Defence specialist organizations.

Most of the countries that already had these organizations have increased or are increasing the size of them in order to deal with NBC threats to deployed military forces and homeland security. For instance, in 1998, France consolidated its NBC Defence units into the Groupe de défense nucléaire biologique et chimique. Given the current threat, this organization will quadruple in size by 2008 to 1000 members.[146] In 1995, Italy formed a full time NBC Defence Regiment of 700 highly trained NBC Defence specialists that will be doubled in size in the near future due to its high operational tempo.[147] Germany has consolidated its NBC Defence battalions to form an NBC Defence brigade, and created the Special NBC Defence Reaction Team to provide a rapid response to NBC terrorism.[148] The US has enlarged both its Army Technical Escort Unit and Marine Corps Chemical Biological Incident Response Force (CBIRF). In addition, a total of 55 Weapons of Mass Destruction Civil Support Teams are being established to provide consequence management support in

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[146] Ministére de la Defénse, "Groupe de défense nucléaire biologique et chimique," http://www.defense.gouv.fr/sites/terre/decouverte/presentation_de_l_armee_de_terre/armes_et_composantes/genie/groupe_de_defense_nuclaire_biologique_et_chimique; Internet; accessed 28 February 2005.

[147] Rob de la Poer, "The Italian Job," *Defence International*, (Winter 2004): 26-28.

[148] North Atlantic Treaty Organization, *National Information Brochure* (Brussels: NATO Training Group, 2004), 148-152.

case of NBC incidents, as part of the overall emphasis on homeland security in the continental US.

At a meeting in Prague in 2002, the NATO Defence Ministers recognized that NATO's ability to rapidly respond to an NBC event within the NATO area of operations or elsewhere was insufficient. This led to several significant initiatives, including the creation of a NATO CBRN Battalion and several deployable laboratories.[149] The manning of the NATO CBRN Battalion is done on a volunteer basis from NATO countries for six-month time periods. Many smaller and/or new NATO countries have discovered that the contributing NBC Defence specialists to the NATO CBRN Battalion or to NATO operations provides a niche capability that is of military value to both the alliance and themselves. For instance, the Czech Republic sent a Chemical Defence Company to Kuwait in 2002 - 2003,[150] and provided 100 personnel to support the 2004 Olympic Games in Athens. Similarly, Poland contributed 52 NBC Defence specialists to the Athens Games.

NBC Defence Corps - United States

Throughout most of NATO's history, the US and Germany were the only countries that contained an NBC Defence Corps in their force structure and had the ability to fully operate in the Cold War nuclear and chemical threat environment. The US has the largest number of NBC Defence specialists of any Western military force. The consistent use of

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149 North Atlantic Treaty Organization, "Multinational CBRN Defence Battalion - Progress Report 1 Dec 2003," http://www.nato.int/docu/speech/2003/s031201c.htm; Internet; accessed 11 April 2005.

150 Jane's Information Group, "Sentinel Security Assessments," http://sentinel.janes.com/; Internet; accessed 13 October 2004.

chemical weapons during the First World War served as the impetus for the creation of a Chemical Warfare Service in the American Expeditionary Force in France, and the Gas Service Office in the War Department in Washington. Following the war, Congress authorized the retention of the Chemical Warfare Service as part of the Army organization to develop both offensive and defensive chemical capabilities. The preparedness of the US and other nations for chemical warfare during World War II was one of the principal deterrents to its use.[151] By the mid-1970s, the strength of the US Army Chemical Corps had fallen to about 1600 members, and the Chemical School was almost closed. Only after the scope of the Soviet chemical defence capabilities became known from captured equipment during the Yom Kipper war in 1973, were steps taken to address the American weakness in both offensive and defensive chemical warfare.[152]

At the present time, NBC Defence specialists are included in the US Army, Air Force and Marine Corps, with the Army Chemical Corps of just under 20,000 personnel being the largest of the services. There are about 700 enlisted NBC Defence specialists in the US Air Force. Employed in the readiness flights of the civil engineering squadrons, they provide a response capability for NBC events, and natural or manmade disasters. The Readiness flights also provide enhanced training for integral support teams and basic refresher training

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[151] Leo P. Brophy, *The Chemical Warfare Service: Organizing for War* (Washington, D.C.: Department of the Army, 1959), ix, 4-8.
Department of the Army, "History of the U.S. Army Chemical Corps History," http://www.wood.army.mil/usacmls; Internet; accessed 14 Sep 04. In 1946, the Chemical Warfare Service was re-designated the Chemical Corps.

[152] Edward M. Spiers, *Chemical Warfare* (London: Macmillan Press, 1986), 142-145.

for the remainder of the base personnel.[153] Readiness officers receive four weeks of training, while enlisted personnel take an eight-week course followed by a number of short ones. The US Navy does not have NBC Defence specialist units. Some shore-based units have CBR-D (Chemical Biological Radiological Defence) officers who receive five weeks of training at Fort Leonard Wood, Missouri. There are no NBC Defence specialists aboard ships, but shipboard personnel do receive individual NBC Defence training.[154] With the exception of the CBIRF of 350 marines and sailors, there are no NBC Defence specialist units above platoon size within the US Marine Corps force structure. The Marine Corps does, however, have both officer and enlisted NBC Defence specialist occupations, which, in 1999, numbered 117 and 672 personnel respectively. NBC Defence specialists are trained on Marine Corps courses as detailed in Table 2, while some specialists take additional Army courses. In addition, a Senior NCO course is being developed. NBC Defence specialists are located at all levels of command down to battalion. Unit NBC Defence officers are responsible for training integral NBC Defence teams.[155] The Air Force, Navy and Marine

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[153] Department of the Army, FM 3-11 *Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological and Chemical Defense Operations* (Washington, D.C.: Headquarters Department of the Army, March 2003), D-1 - D-10. Teams include Shelter Management Teams, Contamination Control Teams and Disaster Preparedness Support Teams.

Department of the Army, US Army Chemical School, "USAF NBC Defence Program," (Joint Senior Leaders Course, November 1999).

NATO, *National Information Brochure* …, 296, 329-332.

[154] Department of the Army, FM 3-11 *Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological and Chemical Defense Operations* …, B-1 - B-2.

[155] Department of the Army, US Army Chemical School, "USMC NBCD Capabilities Brief," (Joint Senior Leaders Course, November 1999). Marine Division Headquarters have one officer, five Senior NCOs and 18 Marines, Regiments one officer and one Senior NCO, and Battalions one officer and two enlisted personnel. Marine Air Wing Headquarters have one officer, two Senior NCOs and five enlisted marines, Groups have one officer, one Senior NCO, and seven Marines, while six enlisted NBC Defence specialists are in each Support Squadron. In the Forward Service Support Group (FSSG) there are two officers, 11 Senior NCOs and 52 Marines, with at least one NBC Defence specialist in each of the FSSG battalions.

Department of the Army, FM 3-11 *Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological and Chemical Defense Operations* …, C-1 - C-7.

NATO, *National Information Brochure* …, 298.

Corps rely on Army Chemical Corps units for NBCD GS. So, for example, a Marine Expeditionary Force could expect the Army to provide it one biological detection company, one NBC reconnaissance company, and seven smoke/decontamination companies.[156]

Within the US Army structure, chemical battalions and a variety of companies are distributed throughout the structure, and chemical brigade headquarters are allocated at Corps and Army levels.[157] Chemical Corps specialists are also included in the new Stryker Brigade headquarters, and an NBC reconnaissance platoon is contained in the brigade reconnaissance unit. Chemical Corps officers are employed on formation and command NBC staffs at all levels. In Army manoeuvre combat units, Chemical Corps officers are employed as the Assistant Operations Officer, while non-manoeuvre combat units are assigned a Chemical Corps NCO. All companies, except headquarters companies, are also authorized a Chemical Corps NCO. These Chemical Corps personnel perform unit NBC Defence functions, and provide expert training to enhance the unit's ability to survive and fight in a contaminated environment.[158] Incorporating NBC Defence specialist personnel right into combat units differs from most other countries, and successfully places NBC Defence specialist expertise at the lowest possible level. It also provides the Chemical Corps officers and NCOs with

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156 Department of the Army, FM 3-11 *Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological and Chemical Defense Operations …*, A-2 - A-10.

157 Ibid., A-2 - A-10. Types of NBC Defence Companies in the US Army are: Reconnaissance (one per theatre, one per corps and one per Marine Expeditionary Force (MEF)), Biological Detection (one per corps, one per Theater Army, one per MEF), Reconnaissance/Decontamination (one per Armoured Cavalry Regiment, one per seaport), and Smoke/Decontamination (one per division, six per corps, four per Theater Army, one per Marine division, six per MEF, one per seaport and airfield).

158 Ibid., A-11 - A-13.

experience that is useful in future employment on formation NBC Defence staffs and in Chemical Corps units.

Table 2 - United States NBC Defence Specialist Occupation Training[159]

Training Course	Training Duration
US Army Chemical Enlisted Occupation Training (includes 9 weeks of basic recruit training)	19 weeks
US Army Chemical Basic NCO Course (BNCOC)	11 weeks
US Army Chemical Advanced NCO Course (ANCOC)	8 weeks
US Army Chemical Officer Basic Course	19 weeks
US Army Chemical Captain's Career Course	18 weeks
US Army Nuclear, Biological, Chemical Reconnaissance	6 weeks
US Army Master Fox (NBC Reconnaissance vehicle) Scout	3 weeks
US Army Biological Integrated Detection System (BIDS)	4-1/2 weeks
US Army Chemical Pre-Command and Division/Corps Staff	1 week
USMC Enlisted Basic NBC Defense Course MOS 5711	11 weeks
USMC Officer Basic NBC Defense Course MOS 5702	12 weeks
USAF Readiness Apprentice	10 weeks
USAF Readiness Craftsman	2 weeks

The Chemical Corps personnel, as well as personnel from the other services, receive detailed training as depicted in Table 2, some of it highly technical. Many of the Chemical Corps officers have advanced degrees in science. The majority of formal individual NBC Defence specialist training is done at Fort Leonard Wood, Missouri, which is the home of the US Army Chemical School and the NBC Defence training institutions of the other services.

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[159] NATO, *National Information Brochure* …, 295-332. The Officer Basic Course prepares Chemical Corps officers to command platoons in Chemical Corps units and function as Battalion NBC Officers in combat units. Brigade NBC officers, NBC staff officers at higher levels, and chemical unit company commanders are trained on the Captain's Career Course. For enlisted personnel, basic training prepares soldiers to perform duties in Chemical Corps units, while the Basic NCO Course prepares NCOs to perform NBC duties in combat units and sub-units as well as lead squads in Chemical Corps units. The Advanced NCO Course prepares NCOs to function as Platoon Sergeants in Chemical Corps units and perform chemical NCO staff duties in combat units and formations.

NBC Defence specialists have a vital role in homeland defence and the protection of war fighting units and installations within the continental United States and overseas.

NBC Defence Corps - Germany

With regard to NBC Defence, Germany has one of the best-trained and equipped military forces.[160] This recognition is the result of the priority assigned to it by the German Government and the efforts of the NBC Defence Corps. Within German doctrine, the ability to operate in an NBC environment is dependent on basic NBC Defence measures taken by individuals and units to survive and sustain themselves. This is supported by the actions of the NBC Defence Corps, which relieves the combat units of the NBC Defence tasks that are resource-intensive and require specialist equipment. The German NBC Defence Corps is responsible for providing specialist NBC reconnaissance, thorough decontamination, warning and reporting, water purification, and advice. It is also responsible for assisting with several related tasks, such as EOD, fire fighting, environmental protection, radiation safety, and hygienic measures. The interaction between these activities led to the creation of the NBC Defence and Self-Protection School that is responsible for joint instruction on NBC Defence, EOD fire fighting, environmental protection, radiation safety, and hygienic measures.[161] The German Navy does not have any NBC Defence specialists and only trains its personnel to unit standards. The recent restructuring of the Air Force installation defence forces has resulted in the creation of two full-time NBC Defence squadrons in ground combat support

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160 Jane's Information Group, *Jane's Nuclear, Biological and Chemical Defence 2004-2005.* 17th ed. (Coulsdon, Surrey, UK; Alexandria, Va.: Jane's Information Group, 2004), 9.

161 NATO, *National Information Brochure* …, 177-194.

battalions.[162] German NBC Defence expertise is well respected within NATO, and German officers occupy many of the NBC Defence staff officer positions in the various headquarters.

Former Warsaw Pact NBC Defence Corps

In 1999, NATO was expanded to 19 countries with the inclusion of the Czech Republic, Poland and Hungary, increasing the number of countries with an NBC Defence Corps. These former Warsaw Pact countries continue to follow the Soviet model that includes "Chemical Defence Troops". According to an analysis by the United States Defence Intelligence Agency, the Soviet Ground Forces' ability during the Cold War to survive and operate in an NBC environment was unmatched by any other country.[163] After suffering massive gas casualties during the First World War, specialist chemical defence troops were incorporated into the Red Army when it was formed in 1918. During the Second World War, chemical defence companies were organic to Soviet rifle divisions, and included numerous reconnaissance teams and field laboratories. There were approximately 50,000 NBC Defence specialists in the Soviet Ground forces during the Cold War, with an additional 50,000 reservists.[164]

Chemical troops were considered an essential component of combat support. Each Group of Forces contained a brigade of at least three chemical defence battalions and a reconnaissance battalion. In addition, each combined arms army and tank army had a

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[162] Ibid., 154.

[163] John H. Westerhoff, *CBR Protection of Soviet Ground Forces* (Washington, D.C.: Defence Intelligence Agency, June 1980), vii, 34.

[164] Ibid., 1-2.

chemical defence battalion. At the division level, there was another chemical defence battalion, while tank and motorized rifle regiments had an organic chemical defence company. Chemical defence battalions included NBC reconnaissance and decontamination capabilities.[165] Command of these NBC Defence units and technical advice was entrusted to officers who received extensive training, including engineering or science degree programs, and advanced chemical officer and senior chemical officer courses of 30 and 28 months respectively. Chemical NCOs completed a six-month training program. Soviet Air Force and Naval organizations also had chemical officers and units.[166] The Chemical Defence structure of the Soviet Union was also incorporated into those of the other Warsaw Pact countries.

The Armed Forces of Poland, Hungary, and the Czech Republic were also well equipped and trained to survive and operate in an NBC environment during the Cold War. Today, even with the benefits of collective defence provided by membership in NATO, NBC Defence continues to be a priority in these countries, and their expertise and capabilities have been retained. The experience of the NBC Defence Corps of the former Warsaw Pact countries provides some valuable lessons for the older NATO countries.

The Polish Armed Forces (PAF) has an NBC Defence Corps with separate officer and non-officer occupations. The role of the NBC Defence Corps, which comprises about one per cent of the force, is to assist the PAF in accomplishing its missions in an NBC and ROTA

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165 Ibid., 2.

166 Spiers, *Chemical Warfare* …, 121-122.

environment. As such, it is responsible for conducting NBC hazard assessments, warning and reporting, reconnaissance, surveillance and monitoring, rescue operations, and the decontamination of personnel, equipment, routes, areas and facilities. The Land Forces Command has NBC Defence specialist staffs at all levels, including an NBC Defence instructor in combat units. NBC Defence Corps units include both an NBC Defence regiment and a battalion. Divisions contain a separate NBC Defence Company, while brigades contain an organic platoon. NBC Defence staffs are also employed at all levels of command within the Navy and Air Force. Two NBC Defence companies and a helicopter reconnaissance flight are part of the Air Defence structure. Naval aviation, flotillas, and support formations and units all contain NBC Defence specialist sub-units. Professional NBC Defence enlisted personnel receive six months training, while NCOs attend a 10-month course.

Hungary's NBC Defence Corps is responsible for advising commanders on NBC defence matters, planning and coordinating NBC Defence activities, conducting NBC reconnaissance and decontamination, operating the NBC Warning and Reporting System, and assisting with incident management. While combat unit officers and NCOs are trained for NBC Defence activities at the unit level, the training of NBC Defence specialist officers and NCOs is extensive. Professional NBC Defence officer training is a four-year course at the Military Technical College, reserve officers receive nine months training, and NBC Defence NCOs take a one-year course.[167]

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[167] NATO, *National Information Brochure* …, 234, 240, 242.

Chemical Defence troops of Czechoslovakia were formed more than 50 years ago and chemical defence became a specialty. Over time, the number of NBC Defence specialists has grown within the Armed Forces (ACR), such that an NBC Protection Brigade was created in 1997. In addition there are approximately 250 NBC Defence specialists in its engineer brigade. The ACR have the standard NBC Defence specialist role, mission and responsibilities as defined in the NATO *Allied Joint Publication 3.8 Allied Joint Doctrine for NBC*. Over the past 15 years, the Czech Republic has actively contributed to ongoing efforts to maintain peace and security by deploying a chemical company to Kuwait during the first Gulf War in 1990 - 1991 and again in 2002. It has actively participated in the development of the NATO CBRN Battalion and supported the 2004 Olympics Games in Athens.[168] Much of the specialist training is done in realistic scenarios with actual hazards. With regard to education, officers complete a four-year degree program in chemical warfare technology. Despite a substantial reduction in the ACR over the last decade, the requirement for NBC Defence specialist capabilities and the benefits that come from having it have resulted in the NBC Defence Corps being retained with a strength of 1104 NBC Defence specialists out of a total force size of 40,000.[169]

NBC Defence Specialists - Korea

The Korean Peninsula remains one of the potential regional conflicts that threaten world stability. This potential conflict could easily involve NBC weapons, as both sides

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[168] Ministére de la Defénse, "Chemical Defence Troops of the Czech Armed Forces," *Objectif Doctrine* No 35 (n.d.), 49-51.

[169] Colonel Miroslav Sedy, *Chemical Corps of the ACR* [CD-ROM] (Prague: Chief of Chemical Corps, 7 April 2005). The 1998 strength of the ACR was 100,000 with 3,000 chemical defence troops.

possess or are actively pursuing NBC weapons. North Korea's chemical defence forces were formed in 1954. According to the Monterey Institute of International Studies "North Korea's chemical defense force is estimated to be around 13,000 personnel, probably making it the third-largest CW service in the world, with chemical defense units incorporated at the regimental level."[170] South Korea, meanwhile follows the US model, with an NBC Defence Corps and occupations, and incorporates an NBC Defence Battalion in each of its Divisions.

NBC Defence Specialists in Other Countries

Many previous discussions regarding the creation of distinct NBC Defence specialist occupations in the CF have been discounted because only the US and West Germany had established Chemical Corps during the Cold War, while the other NATO countries assigned their specialist NBC Defence responsibilities to existing branches or services.[171] Given the specialist NBC Defence capabilities being developed today, this is not a true reflection of the number of countries that actually utilize an NBC Defence occupation.

In addition to Canada, many countries, including Belgium, Brazil, Denmark, France, the Netherlands, Spain, Italy, and the United Kingdom, assign specialist NBC Defence responsibilities to one or more Branches or Corps, or in some cases, individuals, regardless of occupation, are assigned as needed to NBC Defence specialist duties. For example, the United Kingdom's Joint NBC Regiment was formed with members of the RAF Regiment and the Armoured Corps, while NBC Defence staff and training officers appear to be from a

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[170] Monterey Institute of International Studies. "Nuclear Threat Initiative - North Korea Profile." http://www.nti.org/e_research/profiles/NK/Chemical/index.html; Internet; accessed 24 April 2005.

[171] DND, *CRS Evaluation of Nuclear Biological and Chemical Defence Volume II*…, 42

variety of regiments and branches. Italy, with the planned increase to its NBC Defence Regiment, is investigating an occupation in order to retain expertise within that unit. While NBC Defence specialist responsibilities are distributed to existing branches or services in many countries, what has not been previously considered is the fact that in some cases, these functions were performed by separate occupations within that branch. The obvious example is France, which has assigned NBC Defence specialist responsibilities to its engineers. The Groupe de défense nucléaire biologique et chimique is currently a component of the Engineer Brigade, and NBC Defence advice is provided through Engineer staffs in the various headquarters. The NBC Defence specialist functions, however, are performed by NBC Defence specialist occupations. A separate school at Draguignan, Centre de Formation de la Defense NBC, provides initial training for NBC Defence specialists, and additional career training in NBC decontamination, reconnaissance, warning and reporting, and toxic industrial materials.[172] The advantage of this approach appears to be twofold: firstly, the development and retention of expertise by continuous employment in the NBC Defence field, and secondly, the synergy between the engineer functions of mobility, counter-mobility and protection, with those functions dealing with physical hazards such NBC, hazardous materials and unexploded ordnance.

Many countries have already established a connection between NBC Defence functions and their Engineer branch. As depicted in Table 3, some countries include their NBC Defence specialist capabilities in engineer units. Many conduct their NBC Defence specialist and all-arms training at their engineer schools or in conjunction with their training

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[172] Ministére de la Defénse, "Groupe de défense nucléaire biologique et chimique."

establishments for firefighting or EOD. Because both of these are engineer functions in Canada, Chapter 5 will investigate the feasibility of the Engineer Branch assuming responsibility for NBC Defence.

Table 3 - Foreign NBC Defence Specialists and the Engineer Connection[173]

Country	Armed Forces Size	Army Size	NBC Defence Role of Engineers
Australia	52,600	25,600	Converted a Combat Engineer Regiment to form an Incident Response Regiment with a CBRN Squadron. Engineer School is responsible for instructing joint NBC Defence, firefighting and EOD.
Belgium	39,800	26,700	Engineer Battalions include an NBC Company. Engineers are responsible for thorough decontamination. Engineer School is responsible for NBC Defence.
Czech Republic	40,000	23,000	NBC Defence Corps with specialist officer and NCO occupations.
Denmark	23,860	12,060	Engineer Battalion includes an NBC Company. Engineers are responsible for thorough decontamination. Engineer School is responsible for NBC Defence.
France	241,600	133,500	NBC Defence and firefighting are engineer functions. The Engineer Brigade contains the NBC Defence specialist organization.
Germany	284,600	191,600	NBC Defence Corps and occupations. Combined Firefighter and NBC Defence School, along with EOD and environment protection.
Hungary	35,000	23,000	Combined Firefighting and NBC Defence School. NBC Defence Corps with officer and NCO occupations.
Italy	374,000	202,600	Combined Firefighting and NBC Defence School.
Netherlands	51,400	23,000	NBC Defence is an Engineer responsibility. NBC School is co-located with the Engineer School.
Norway	26,700	15,000	Engineers are responsible for thorough decontamination.
Poland	133,150	87,900	NBC Defence Corps with officer and NCO occupations.
Spain	70,630	48,000	Co-located NBC Defence and Engineer training establishments.
United Kingdom	198,180	103,780	Joint NBC Regiment consists of Armoured Corps and RAF personnel.

[173] Dubois, *Nuclear Biological Chemical Defence*…, 6. Major Dubois's table has been updated with new and additional information.

Jane's, "Sentinel Security Assessments."

United States	1,393,700	485,500	Separate Chemical Corps and occupations within the Army. The Army Engineer and Chemical Schools are co-located. NBC specialist occupations in the Marine Corps. NBC Defence is an engineer responsibility in the US Air Force with a separate occupation.

Conclusion

Clearly, many countries have recognized the requirement for an expanded NBC Defence specialist capability, and steps are being taken to enhance it. In this regard, Canada has created the new Joint NBC Defence Coy. An analysis of the NBC Defence capabilities of some other countries, shows that those with NBC Defence specialist occupations are better prepared to implement NBC Defence measures and survive in an NBC environment, than those nations where NBC Defence is an all-arms responsibility or a secondary function for other branches. These countries are more willing to deploy into areas of operations in which there is a significant NBC risk, such as to Iraq. Indeed, the lack of an NBC Defence specialist capability has been suggested as one of the reasons Canada did not deploy land forces during the first Gulf War to liberate Kuwait.

An occupation in this technical field allows for the selection of personnel with scientific backgrounds and the provision of thorough training. A comparison of the course training times provided in the 2004 NATO *National Information Brochure* and this Chapter demonstrates that NBC Defence specialists in the CF do not receive as much training as those of other countries. Many countries with NBC Defence occupations provide university level training for their personnel. Countries with NBC Defence Corps or occupations are able to benefit from the continuous employment of their specialists on NBC Defence duties

throughout their career, allowing them to develop experience and expertise. This, in turn, allows these NBC Defence specialists to provide advice and information with confidence and authority. It is interesting to note that the Czech Republic, with only 40,000 military personnel, maintains an NBC Defence Corps and has a world-class reputation in this field. Another model that Canada should perhaps emulate is the USMC structure, with 117 officers and 672 enlisted personnel in their NBC branch. Similarly, France provides an example of an NBC Defence specialist occupation and responsibilities embedded into the Engineer Corps to harness the synergy between force protection and mobility. In all the countries studied, not only do NBC Defence specialists bring NBCD GS competence to the battlefield and homeland defence, they also provide the expertise to train and prepare other military and civilian organizations to survive in an NBC environment. After having examined and considered the structure, manning and conduct of specialist NBC Defence of some other countries, what avenue should Canada follow? With many of the best-prepared countries employing or investigating NBC Defence specialist occupations, Canada should consider the feasibility of adding NBC Defence specialist occupations to the occupational structure.

Chapter 5 - NBC Defence Specialist Occupations and Proponency in the CF

> NBCW [NBC Warfare], with all its implications and associated fields, is a highly technical field requiring great interest and continual study, if those involved are to make a useful contribution.
>
> Lieutenant-General Dare,
> Vice Chief Defence Staff, 1970[174]

Introduction

An occupation is a grouping of personnel that is used by the CF for employment and personnel management. Personnel within an occupation perform like jobs and tasks that in turn require similar skills and knowledge. Over time, personnel benefit from experience within the occupation and develop a sense of esprit-de-corps and belonging. In order to incorporate an occupation into the personnel structure of the CF, there must be an operational requirement and sufficient personnel to warrant it. In addition, it must provide adequate personal development and career progression for its members. Building on the description of NBC Defence roles and organizations outlined in Chapter 3, as well as those of other countries in Chapter 4, this Chapter will look at the feasibility of NBC Defence specialist occupations in the CF. Specifically, it will look at how many NBC Defence specialist positions are required, how those numbers compare to existing trades, and how NBC Defence specialists would be employed. It will conclude with a discussion on which branch should be the proponent for specialist NBC Defence in the CF.

The NBC threat to Canada and the CF during operations has resulted in the growth of NBC Defence specialist capabilities. The expertise of these NBC Defence specialists is

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[174] Johnston, *Employment of NBC Staff Officers* …, 3.

higher than what was previously taught by CFNBCS, and experience has shown that NBCD GS and CS functions have to be performed by properly trained personnel on a continuous basis. There is no criteria for selecting NBC Defence specialists in the CF, nor is there a satisfactory management plan to maintain and benefit from this expertise. Many senior officers and senior NCOs lack the necessary experience for employment in NBC Defence supervisory positions. There is a continual drain on NBC Defence specialist expertise when the individuals return to their original occupation, which is costly in terms of training time and resources, and poses a risk during CF operations. NBC Defence specialists fulfill an essential military function, but the challenge now is such that this function can no longer be considered a generic task, as it requires a lifetime of training and experience. There is, therefore, a necessity to create NBC Defence specialist occupations for both officers and NCMs.

NBC Defence Occupation Sizes

Major Dubois, in his briefing note, concluded that a single occupation ". . . that provided an acceptable career path would likely develop and maintain a far better level of NBC expertise and profile in the CF."[175] Given the limited number of full-time NBC Defence personnel and the consistent trend to reduce the number of occupations, however, Major Dubois discounted the feasibility of a separate occupation.[176] His assessment of the number of personnel did not take into consideration the full requirement for NBC Defence specialists in the CF. As well, the number of NBC Defence specialists has definitely risen

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[175] Dubois, *Nuclear Biological Chemical Defence*…, 3. Major Dubois was only referring to officers in this briefing note.

[176] Ibid., 5.

since LCol Johnston produced his study in 1987. The Joint NBCD Coy is the most noteworthy addition and has significantly increased the number of NCMs required as NBC Defence specialists.

Based on both the doctrinal and current NBC Defence specialist employment requirements, as well as initiatives being undertaken to further develop NBC Defence specialist capabilities in the CF, Table C-1 in Annex C provides an estimate of the NBC Defence specialist positions needed to meet the operational requirements of the CF. It includes personnel required to fulfill NBC Defence staff positions in strategic, operational and formation headquarters, as well as those in NBC Defence specialist units and research establishments. It also includes positions in joint and command NBC Defence training establishments, as well as exchange positions. This table does not imply that all these individuals are employed as NBC Defence Specialists on a permanent basis. Rather, it suggests that, while some may be employed as NBC Defence specialists on a full-time basis, others may be employed on a part-time basis, but are trained and available to meet the operational requirement of the CF. For example, an NBC Defence officer may be employed on a permanent basis in any staff branch of an operational headquarters, but is available to man the NBC Centre that the headquarters is obliged to establish when required. To be more specific, it is current practice to employ combat arms officers in the G3 NBC section of brigade headquarters, but who are primarily responsible for training on a day-to-day basis. These officers may attend the three-week Unit NBC Defence Officer course, but are unlikely to attend the Advanced NBC Defence Officer course that provides the training for command and formation NBC Defence staff officers. The result is that these combat arms officers have

to maintain their occupation knowledge and skills while performing the Brigade training function on a daily basis, as well as maintain their NBC Defence skills. With such a high tempo in the CF today, NBC Defence knowledge and skills quickly fall by the wayside. The solution is the employment of NBC Defence specialists, with NBC Defence knowledge and skills engrained through training and experience, in various positions throughout headquarters in the CF. They would then be available to provide NBC Defence advice and planning on a daily basis, as well as when an NBC or ROTA event occurs.

In addition, Table C-2 illustrates other positions that would be beneficial for the CF if NBC Defence specialists filled them. For example, given the worldwide NBC weapon counter-proliferation effort, it would be suitable for them to fill positions in J3 Arms Control Verification and J2 Defence Scientific Intelligence. Also, several initiatives being undertaken by the CF would be best supported by NBC Defence specialists. For instance, 1 Canadian Air Division hopes to create a Vanguard NBCD CS capability. The development of the Counter-Terrorism Technology Centre at Suffield would be perfect employment for NBC Defence specialists. As well, the proposed NBC Defence specialist units being created by the Land Force Reserve Restructure project should be supported by properly qualified NBC Defence specialists, as should the decontamination platoons being formed in the new service battalions.

Assuming all the essential and potential positions outlined in Annex C were assigned to new NBC Defence occupations for officers and NCMs, the total would amount to 123 officers (40 Senior Officers and 83 Junior Officers) and 324 NCMs (105 Warrant Officers

and Sergeants and 219 Junior Ranks). These numbers are based on converting existing positions, and do not entail the creation of new positions. One of the arguments against NBC Defence occupations has always been the limited number of personnel. There are, however, a number of small trades within the CF. An analysis of the smaller NCM trades listed in Table D-1 of Annex D indicates that an NBC Defence NCM occupation would be larger than 21 other occupations. An NBC Defence officer occupation would be larger than eight other occupations and about the same size as four others as shown in Table D-2. There are, therefore, sufficient NBC Defence specialists required within the CF to justify separate officer and NCM occupations.

NBC Defence Specialist Officer Employment and Training

An occupation must have an acceptable career development pattern that builds on initial training and experience gained through practical employment. There must also be advanced training and professional development opportunities to prepare individuals for promotion and employment in positions of higher responsibility. Assuming an NBC Defence specialist occupation similar to the specialist Training Development Officer occupation, it would be expected that officers would transfer to it at the Captain rank, after having served one or two tours in their original occupation. Potential officer employment is depicted in Table 4. After NBC Defence specialist training, initial employment would include junior officer positions in the Joint NBCD Coy and units providing NBCD CS in the Navy, Army, and Air Force. Initial employment could also be as Formation NBC Defence Officers or Radiation Safety Officers in brigade and wing headquarters, or as instructor-supervisors in training establishments where individual and unit-level NBC Defence training is conducted.

Further employment would include more senior positions in the Joint NBCD Coy and Nuclear Emergency Response teams, instructor-supervisor positions in CFNBCS, as well as NBC Defence staff positions in national, command and operational headquarters, and research and development establishments. With the creation of NBC Defence specialist units in the Reserve Force, NBC Defence specialist officers could be employed as regular support staff.

Following advanced training, employment at the Major rank level would include NBC Defence staff positions in national headquarters and on command staffs, and supervisory positions in operational-level headquarters and research and development establishments. Responsibilities would include operations, policy, doctrine and capability development, equipment management, and training in the NBC Defence, Nuclear Emergency Response, and Radiation Safety fields. Command appointments at this rank level would include the Joint NBCD Coy and any NBC Defence specialist units in the Navy, Army, and Air Force. NBC Defence specialist Majors would be employed in the training management role in CFNBCS and NBC Defence training or readiness organizations in the Navy, Army and Air Force. NBC Defence specialist officers could be employed as instructors at the Royal Military College of Canada if provided post-graduate training. At the Lieutenant-Colonel rank level, employment would include NBC Defence staff appointments in National Defence Headquarters, command of the combined CFNBCS and CFFA, and as Senior Military Officer at the Defence Research and Development Canada Suffield. The result would be a logical employment pattern that builds on training and experience, as well as providing the opportunity for adequate career progression.

Table 4 - NBC Defence Specialist Officer Employment

Rank	**NBC Defence Staff**	**NBC Defence Operational and Training Units**	**Other Employment**
Lieutenant-Captain – first NBC Defence tour	▪ Base Radiation Safety Officer ▪ Formation NBC Defence Officer - Land Force Brigades - Air Wings	▪ NBC Specialist Unit Troop/Team Leader - Joint NBCD Coy - NER Team - ECS NBC Close Support units ▪ Liaison Officer-Joint NBCD Coy ▪ Instructor-Supervisor - ECS NBC trg establishments	
Captain – additional NBC Defence tours	▪ NBC Defence Staff Officer - Operational Headquarters - Strategic Headquarters	▪ NBC Specialist Unit HQ Staff - Joint NBCD Coy (DCO, Ops O, and Trg O) ▪ NER Scientific Officer ▪ NBC Specialist Training Instructor-Supervisor - CFNBCS	▪ Research and Development ▪ Equipment management ▪ Non-NBC Defence positions ▪ Post-graduate education
Major	▪ NBC Defence Staff Officer - Operational Headquarters - Command Staff - Strategic Headquarters	▪ NBC Specialist Unit Command - Joint NBCD Coy - ECS NBC Close Support unit ▪ NBC Training Management - CFNBCS/CFFA CI - ECS /DRDC training ▪ Instructor RMC	▪ Research and Development ▪ Equipment management ▪ Non-NBC Defence positions ▪ Post-graduate education
Lieutenant-Colonel	▪ NBC Staff Section Head - Strategic Headquarters	▪ NBC Training Management - CFNBCS/CFFA Cmdt	▪ DRDC Suffield SMO ▪ Non-NBC Defence positions

NBC Defence Specialist NCM Employment and Training

The creation of the Joint NBCD Coy in 2002 has significantly increased the number of NCMs needed as NBC Defence specialists. The current challenge being encountered by the Company of maintaining NBC Defence skills would be solved by the creation of an NBC Defence specialist occupation for NCMs. With a future strength of 150 personnel and an

estimated turnover of 25 percent every year, there will be a period of time when a significant portion of the Company will be non-effective until new personnel are trained. This will have a significant impact on the Company's ability to provide a domestic NBC counter-terrorism response and support CF operations abroad. The adoption of an NBC Defence occupation would allow personnel to be trained on the basic training list prior to being posted to the Company, thus allowing it to remain at full strength most of the time.

The other critical factor is the training and experience of Senior NCOs and Warrant Officers for the Joint NBCD Coy, as well as CFNBCS and other organizations that employ them. The strength of the CF is in the leadership, knowledge and skills of its Senior NCOs. They gain occupational expertise from courses and as they progress through their career. Officers respect that knowledge and rely on their advice when making plans and decisions. The current structure of NBC Defence continually imports new Senior NCOs who lack the NBC Defence experience and knowledge to properly provide technical advice to their officers for training and operations. The new NBC Defence specialist training being conducted at CFNBCS provides more technical information to the junior ranks, whereas Warrant Officers and officers receive training on NBCD GS and CS planning and supervision. Thus the Warrant Officers are being employed without the depth of knowledge that is normally associated with their rank. The creation of an NBC Defence specialist occupation for NCMs would ameliorate this situation, as Senior NCOs would have previous NBC Defence specialist experience.

It is envisioned that an NCM NBC Defence specialist occupation would be based on occupational transfers at the Corporal rank, as in the Firefighter and Ammunition Technician trades. As depicted in Table 5, initial NBC Defence specialist occupation training would be conducted to prepare individuals to perform decontamination and collective protection duties, as well as to assist with NBC specialist reconnaissance in the Joint NBCD Coy and other NBCD CS and GS units. Following further NBC Defence specialist training, additional tours at that rank would include specialist reconnaissance and surveillance duties in the Company and other NBCD specialist units, or as an NBC Centre operator in the Company or in an NBC Centre. Master-Corporals and Sergeants would be trained and employed as detachment commanders for decontamination, reconnaissance, and surveillance in operational NBC Defence specialist units, or as NBC Centre operators in a formation headquarters. Other employment at that rank level could include NBC Defence instructional duties at CFNBCS and other NBC Defence training establishments, as well as regular support staff with the NBC Defence reserve units.

Warrant Officers would use previous NBC Defence specialist experience to advise Troop/Platoon/Flight officers in the training, planning and conduct of NBC Defence specialist activities. As well, they might function as a shift supervisor in a Formation NBC Centre. Master Warrant Officers and Chief Warrant Officers would be employed as Sergeant-Majors of NBC Defence specialist units and training establishments. In addition they may be employed as NBC Defence staff officers in operational and strategic headquarters in the areas of operations, training, research and development, and equipment management.

Table 5 - NBC Defence Specialist NCM Employment

Rank	**NBC Defence Staff**	**NBC Defence Operational and Training Units**	**Other Employment**
Corporal – first NBC Defence tour		▪ Decontamination / Collective Protection Detachment member ▪ Assistant Recce Specialist - Joint NBCD Coy - ECS NBCD CS units	
Corporal – additional NBC Defence tours	▪ NBC Centre Operator - Operational Headquarters - Land Brigade Headquarters - Air Wing Headquarters	▪ NBC Centre Operator or ▪ Recce/Surveillance Specialist - Joint NBCD Coy - ECS NBCD CS units ▪ Basic NBC Defence instructor (CFRLS)	▪ Reserve Regular Support Staff
Master Corporal – Sergeant	▪ NBC Centre Op/Instructor - Operational Headquarters - Land Brigade Headquarters - Air Wing Headquarters	▪ NBC Specialist Detachment Commander - Joint NBCD Coy - NER Team Staff - ECS NBCD CS units ▪ NBC Defence Instructor - CFNBCS - ECS NBC trg establishments	▪ Equipment management ▪ Reserve Regular Support Staff ▪ Non-NBC Defence positions
Warrant Officer	▪ NBC Centre Shift Supervisor - Operational Headquarters - Strategic Headquarters	▪ Duty Officer / Troop WO - Joint NBCD Coy - ECS NBC CS units ▪ Instructor Supervisor - CFNBCS - ECS NBC trg establishments	▪ Equipment management ▪ Reserve Regular Support Staff ▪ Non-NBC Defence positions
Master Warrant Officer Chief Warrant Officer	▪ NBC Defence Staff Officer - Operational Headquarters - Command Staff - Strategic Headquarters	▪ Sergeant-Major - Joint NBCD Coy - CFNBCS - ECS NBC CS units	▪ Research and Development ▪ Equipment management ▪ Non-NBC Defence positions

Viable employment and career progression would, therefore, be available for both officer and NCM NBC Defence specialist occupations. NBC Defence specialist skills would be trained upon occupational transfer, and expertise developed throughout the individual's

career. The loss of NBC Defence expertise in the CF would be minimized, and the ability of the CF to operate in an NBC environment would be enhanced.

NBC Defence Specialist Proponency

It should be noted, however, that both the officer and NCM occupations would be small in comparison to many of the other occupations, with the highest ranking officer being a Colonel. It would likely be difficult to take care of branch management, administration, history, esprit-de-corps, and have the influence of the larger branches within the CF. A review of the smaller occupations listed in Table D-1 indicates that seven of the smaller trades belong to the Engineer Branch and four belong to the Health Services Branch. For the officer occupations listed in Table D-2, seven belong to the Health Services Branch. These occupations, therefore, are able to leverage support from their Branch, and in some cases, form portions of Career Fields being introduced to the CF by the MOSART project.[177] The question then becomes, which branch is ideally suited to take responsibility for NBC Defence and these small occupations?

Within the Navy, NBC Defence is not assigned to any branch or occupation. In the Air Force, NBC Defence responsibilities are split between the Airfield Engineers who are part of the joint Canadian Military Engineer branch, and Aerospace controller occupations

[177] Department of National Defence, "MOSART: Shaping Your Future," http://hr.ottawa-hull.mil.ca/mosart/engraph/home_e.asp; Internet; accessed 6 July 2004. Military Occupational Structure Analysis and Tailoring Project (MOSART). MOSART has the mandate to develop and implement a modernized operational-oriented, and cost effective occupational structure by 2007, including broader Career Fields that encompass one of more occupations.

which are strictly Air Force functions, and therefore not able to provide support to the Army or Navy.

While studying the various Army corps that could take NBC Defence under its wing in 2003, Major Dubois noted that the Armoured Corps only provides army war fighting units with little joint interaction.[178] The reconnaissance squadrons will not likely be available to conduct NBC reconnaissance, as they will be focusing on the enemy and terrain. The Coyote surveillance vehicle is actually unsuitable for the task due to its cost and importance in the surveillance role. This was confirmed at a recent Army Council meeting, where it was determined that the Coyote vehicles would be only used for surveillance.[179] While a joint branch, the Military Police units only play a minor NBC Defence role within the land and air forces as part of their regular duties. Hence the Armoured and Military Police Corps are not suitable to act as a proponent of NBC Defence.

Other possibilities for NBC Defence proponency are the Health Services and the Logistics Branches, both of which are joint, and therefore would be able to coordinate and conduct NBC Defence specialist tasks for all three environments. Currently, within the Army, the general support service battalions conduct thorough decontamination. Within the Navy, the Logistics Officer on board ship normally supervises the NBC reconnaissance and decontamination efforts. The Health Services Branch is responsible for the management of NBC countermeasures and the treatment of NBC casualties. It contains the BioScience

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[178] Dubois, *Nuclear Biological Chemical Defence*…, 5.

[179] Department of National Defence, *Record of Decisions - Army Council Meeting 1-4 November 2004* (1180-1(CLS), 15 December 2004), 4.

officer occupation that has NBC Defence as one of its core functions.[180] NBC Defence, however, is very much an operations function, rather than a service support function. Proponency, therefore, would be better assigned to a more "operations" focused branch.

The Engineer Branch, comprising engineer and airfield engineer officers, combat engineers, construction trades, firefighters, and geomatic technicians, is another potential proponent of NBC Defence. An operationally focused branch, it provides support to all three services. In fact, Engineers have been associated with NBC Defence since the First World War. They were the first practioners of offensive chemical weapons, and were responsible for the development of defensive equipment and procedures in the German, British, French and American Armies during the First World War. "Military engineers are technically trained and equipped to apply science and engineering skill to the needs of the army."[181] As noted in Table 3 in Chapter 4, many other countries assign NBC Defence responsibilities to their Engineer Branch, and many conduct NBC Defence training in their Engineer Schools. Many of those with separate NBC Defence Schools co-locate them with their Engineer Schools. In the CF, there is already a significant correlation between the Engineers and NBC Defence. As Major Dubois observed in his Briefing Note:

> According to current doctrine, Army Engineers are responsible for the provision of water and heavy equipment to decontamination operations, area decontamination, explosive ordnance disposal (including NBC munitions), and the operation and maintenance of Collective Protection (COLPRO). Airfield Engineers are responsible for the co-ordination and conduct of

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180 Department of National Defence, A-PD-055-002/PP-001 *Canadian Forces Manual of Military Occupational Structure Volume 2, Occupational Specification for BioScience Officer* (Ottawa: DND Canada, November 2002), 2-2 - 2-3.

181 War Office, Military Training Pamphlet No. 23 Part I *Operations: General Principles, Fighting Troops and Their Characteristics* (London: War Office, 1942), 20.

> decontamination, NBC reconnaissance and area survey, COLPRO, and NBCD monitoring. Military firefighters provide first response to HAZMAT [hazardous material] incidents and have the ability to conduct gross area decontamination on Air Force bases and in a port, if necessary. Expertise in environmental issues and the WFE [Water, Fuel and Environment] trade would have Engineers playing a significant role in the management and remediation following an NBC event.[182]

At the strategic staff level, there is a great deal of interaction between the Engineer staff and DNBCD because ADM (Infrastructure and Environment) is responsible for radiation safety, hazardous material incidents, and environment protection. This relationship between the Engineers and NBC Defence has become more apparent in the last few years with the increased recognition of the TIM threat. The relationship between engineers and NBC Defence becomes very clear when it is noted that almost half of the personnel assigned to the Joint NBCD Coy were firefighters. Along a similar line, CFSTG merged CFNBCS and the Canadian Forces Fire Academy (CFFA) in July 2002 because of commonality of subject matter, instruction, and equipment, particularly with regard to TIM, and is investigating the feasibility of adding EOD instruction as well. It appears that the Engineer Branch would be ideally suited to assume proponency for NBC Defence within the Canadian Forces and to manage the small NBC Defence specialist occupations.

Conclusion

NBC Defence specialist capabilities are growing in the CF, but the current methods of selecting, training, and managing NBC Defence specialists are inadequate to meet today's challenges. Many senior officers and senior NCOs lack the necessary experience for employment in NBC Defence supervisory positions. Experience has shown that NBCD GS

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[182] Dubois, *Nuclear Biological Chemical Defence*…, 5-6.

and CS skills have to be maintained on a continuous basis. The continual drain on NBC Defence specialist expertise within the CF is costly in terms of training time and resources, and poses a risk during CF operations. NBC Defence specialists perform a critical function, which should no longer be considered a generic task or secondary employment. There is a sufficient personnel requirement and satisfactory employment path within the CF for the creation of NBC Defence specialist occupations for officers and NCMs. These occupations would be larger than many existing ones. At the current time, there is clearly a lack of ownership for NBC Defence, and the solution seems to be to assign it to an existing branch or corps. A review of the various CF branches and occupations involved with NBC Defence clearly demonstrates that the Engineer Branch is ideally suited to assume responsibility for NBC Defence, as is the case in many other countries.

Chapter 6 - Conclusion

Nunquam Nonparati (Never Unprepared)

Motto of the Joint NBC Defence Coy

NBC threats exist and are growing, despite the counter-proliferation efforts of international organizations and many countries around the world. The number of countries with NBC weapons continues to expand, and these weapons are now available to, or are being actively pursued by failed states, as well as by terrorist, extremist, and criminal organizations. These groups may employ NBC hazards in an asymmetric manner to disrupt military operations, as well as to create mass casualties and terror in civilian populations. With industrialization and the "three-block war", it's inevitable that the CF will come into contact with hazardous materials. As the focus shifts to the defence of Canada, the ability of the CF to respond to domestic NBC incidents will continue to be a priority. The CF, therefore, must be prepared to operate in an NBC environment, and as such, requires a robust NBC Defence specialist capability.

In the last five years Canada has made a great effort to improve the NBC Defence capability of the CF through the acquisition of new equipment, the development of new doctrine and training courses, and the creation of the Joint NBCD Coy. While NBC Defence is very much dependent on the measures taken at the unit level within the CF, increasingly, there is a greater reliance on NBC Defence specialists. Although progress has been made, the lack of a permanent group of NBC Defence specialists has hindered the development of

long-term NBC Defence expertise for operational employment, concept and doctrine development, equipment acquisition, and training.

The current ad hoc method of filling NBC Defence specialist positions on a temporary basis is inadequate to meet today's challenges. As numerous studies have indicated, NBC Defence assignments are not generally sought, as they are perceived to be unrewarding and restrictive of career progression. Selected personnel often lack the scientific background and personal qualities required to perform NBC Defence specialist duties. In addition, the CF does not have an adequate means of managing their employment and benefiting from their experience, which results in a continuous loss of expertise through personnel rotation. By creating an actual occupation with a recognized branch advisor NBC Defence specialist positions are more likely to be filled with the right individuals.

With the introduction of new equipment and NBCD CS and GS tasks, the level of knowledge and skills expected of these specialists is higher than what was previously taught by CFNBCS and must be maintained on a continuous basis. Some commanders are not ensuring qualified personnel are employed in NBC Defence specialist positions nor do they allow them the formal training. Many senior officers and senior NCOs filling NBC Defence specialist supervisory and staff positions have not had previous NBC Defence specialist experience. NBC Defence specialists, as a result, often lack sufficient expertise to fulfill their operational, training, and staff functions, and are non-effective for a significant period of time after being assigned to NBC Defence positions. The continual training of new NBC Defence specialist personnel is also costly in terms of time and resources. NBC Defence

specialists perform a critical function that can no longer be considered a generic task or secondary employment.

A number of countries maintain separate NBC Defence specialist corps and/or occupations, or have assigned NBC Defence responsibilities to one branch rather than taking a multiple branch and all-arms approach as has the CF. Those with NBC specialist occupations are better prepared to implement NBC Defence measures than those countries where it's an all-arms responsibility. Training is normally longer and more thorough, and often involves university education. Their Armed Forces are able to benefit from the expertise developed through continuous employment on NBC Defence duties. In some cases, NBC Defence specialists are located right down to sub-unit level. NBC Defence specialists provide an essential capability on the battlefield, but they also provide the expertise to prepare other forces to survive in an NBC environment. Canada would greatly enhance its NBC Defence specialist capability if it followed the chemical defence troop model of the small Czech Armed Forces or the USMC NBC Defence specialist model. France, with a separate NBC Defence occupation, provides an excellent example of NBC Defence firmly embedded in their Engineer structure.

CF studies in the past with regard to NBC Defence specialist occupations have not fully investigated the requirement for NBC Defence specialists, and have tended to disregard the areas where NBC Defence was being ignored or performed as a secondary duty. Today's security environment requires the availability of NBC Defence specialists throughout the CF. The employment of other occupations filling NBC Defence specialist jobs as a temporary

assignment is not satisfactory, nor should they be filled with unqualified personnel. This paper demonstrates that there is a sufficient personnel requirement within the CF for the creation of NBC Defence specialist occupations for officers and NCMs without increasing the manning level of the CF. These occupations, with 123 officers and 324 NCMs, would be larger than some existing ones. There is an adequate breadth of employment and career progression to justify separate occupations. NBC Defence specialist occupations would provide the experienced personnel required for operational NBC Defence specialist units, training units, research and development establishments, and positions in command and formation headquarters. The long-term employment of personnel as NBC Defence specialists would reverse the loss of NBC Defence expertise within the CF. As a result, better training would be provided to units throughout the CF, and NBC Defence specialist units would be provided with properly trained personnel. In the end, the capability of the CF to operate in an NBC environment would be enhanced. A review of the various branches and occupations involved with NBC Defence clearly demonstrates that the Engineer Branch, which already has significant interaction with NBC Defence, would be ideally suited to take on proponency for NBC Defence.

The greater emphasis on NBC Defence readiness in the CF, and greater demand for NBC Defence specialists has rendered the current method of managing NBC Defence specialists as inadequate. The creation of NBC Defence specialist officer and NCM occupations within the Engineer Branch would greatly increase NBC Defence specialist expertise within the CF and enhance its ability to operate in an NBC environment.

Annex A

1987 NBC Defence Occupation Proposal

Table A-1 - Status of NBC Defence Staff Officer Positions in 1987[183]

RANK	TOTAL NO QUALIFIED				TOTAL NO. QUALIFIED FILLING ESTABLISHED POSITIONS				ESTABLISHED POSITIONS WITH NO QUALIFIED STRENGTH			
	SEA	LAND	AIR	GEN	SEA	LAND	AIR	GEN	SEA	LAND	AIR	GEN
COL			1									
LCOL		5	1			1					2	1(2)
MAJ	3	15	14	2	2	5	3		4(1)	9	2	4
CAPT	7	16	9	5	4	4	6		2	6	1	3
LT			1	1								
TOTAL	10	36	26	8	6	10	9		6	15	5	8
NOTES: 1. One position filled by SLT(N) and one position MADVAC. 2. One Major filling a Captain's position.												

[183] Johnston, *Employment of NBC Staff Officers*…, 4. Information is based on a Director Personnel Information Services Report effective 26 March 1987.

Table A-2 - 1987 Proposed Distribution of NBC Staff Officer Positions[184]

COMMAND	UNIT	RANK	COMMENTS
NDHQ/DCDS	DNBCC	1 x Col, 2 x LCol, 8 Maj	1 x Pilot, 1 x LEME
	DSTI	1 x Maj/Capt	1 x MILE
	NORAD HQ	1 x LCol, 1 x Maj	
ADM (Material)	DCGEM	1 x LCol, 3 x Maj, 1 x Capt	LEME
	DRES and DREO	2 x Maj	
	DREO	1 x Maj	LEME
ADM (Personnel)	Surgeon-General	1 x Maj	Medical Doctor
	DCIEM	1 x Maj/Capt, 2 x Capt	MAO-Bio
Force Mobile Command	HQ FMC	1 x Maj, 1 x Capt	
	HQ 1 CBG	1 x Capt	
	HQ SSF	1 x Capt	
	HQ 5 GBC	1 x Capt	
	CTC	2 x Maj, 1 x Maj/Capt	
Air Command	AIRCOM HQ	1 x Maj, 1 x Capt	
	10 TAG HQ	1 x Capt/Maj	
	FG HQ	2 x Capt	
	ATC HQ	1 x Capt	
Maritime Command	MARCOM HQ	2 x LCdr/Maj	
	MARPAC HQ	1 x LCdr	
	CFSS Esquimalt	1 x Lt(N)	
	CFSS Halifax	2 x Lt(N)	
CF Europe	HQ CFE	1 x Maj, 1 x Capt	
	HQ 4 CMBG	1 x Capt	
	HQ 1 CAG	1 x Maj/Capt	
	CFB Lahr/Baden	2 x Capts	
	HQ AFNORTH	1 x Maj	
CF Training System	CFNBCS	1 x LCol, 2 x Maj, 9 x Capt, 2 x Lt(N)	1 x Pilot
Total	1 x Col, 5 x LCol, 27 x LCdr/Maj, 29 x Lt(N)/Capt, and 5 x Maj/Capt		67 Officers

[184] Ibid., B-1 and B-2.

Annex B

Advanced NBC Defence Officer Course (AIOM) Qualification Requirements - 2004

Table B-1 - Positions Requiring the Advanced NBC Defence Officer Course Qualification - 2004[185]

POSN	POSITION TITLE	RANK	UIC	UNIT
01186	N34 DCOS OP Readiness	Cdr	0097	Maritime Force Pacific Headquarters
01390	SSO Ops	LCdr	0100	CFB Halifax
03601	Base Ops Officer	LCdr	0103	CFB Esquimalt
03609	Base NER Officer	Lt(N)	0103	CFB Esquimalt
15435	Executive Officer	LCdr	0493	Naval Officer Training Centre
15473	Tech Officer	Lt(N)	0493	Naval Officer Training Centre
25694	Division Comd	LCdr	1347	CFFS Esquimalt
25700	Training Officer	Lt(N)	1347	CFFS Esquimalt
28833	G3 NBC	Capt	1701	1 CAN Mechanized Brigade Group HQ
30993	Administration Officer	Capt	1754	Royal Canadian Dragoons
40904	G8	Maj	2037	Combat Training Centre HQs
46577	DLERM 2-2	Maj	2184	Director-General Land Equipment Program Management (DGLEPM)
46626	DSSPM 3-2	Capt	2184	DGLEPM
46630	DSSPM 5-2	CWO	2184	DGLEPM
47871	AWC Commander	Maj	2350	Deputy Commander NORAD
53122	BioScience Officer	Capt	2670	CF Environmental Medicine Establishment (CFEME)
53147	BioScience Officer	Maj	2670	CFEME
53153	Engineer	Capt	2670	CFEME
53620	Commandant	Maj	2675	CF NBC School
53622	Standards Officer	Capt	2675	CF NBC School
53628	Adjutant	Capt	2675	CF NBC School
53630	Chief Instructor	Lt(N)	2675	CF NBC School
53631	OC Training Platoon 2	Capt	2675	CF NBC School
53633	OC Training Platoon 1	C/Lt	2675	CF NBC School
53785	Deputy Commanding Officer	Cdr	2698	CF Maritime Warfare Centre Halifax
61433	Damage Control Div Comd	LCdr	3293	CF Naval Engineering School Halifax
61435	NBC Warfare Officer	Lt(N)	3293	CF Naval Engineering School Halifax

[185] DND, ADHOC Report Request 90247 …, 1.

62159	G4	Maj	3334	DG Info Management Operations
62158	DIMR 3	LCol	3335	DG Info Management Strategic Direction
63518	DMPOR 4-3	LCdr	3371	Chief of the Maritime Staff
40793	DAT 4-3 (C2 Concepts)	Maj	3915	Land Force Doctrine and Training System HQ
13786	CounterTerrorism/Continental Operations	Maj	3929	Director NBC Defence
13787	Comd Guidance Development	Maj	3929	Director NBC Defence
13788	Section Head - Policy/ Doctrine/Operations/Training	LCol	3929	Director NBC Defence
13789	NBC Force Protection	Maj	3929	Director NBC Defence
13790	Hazard Avoidance Chem-Bio	Maj	3929	Director NBC Defence
80308	Executive Assistant/Comd	Capt	3996	1 Wing Headquarters
122144	Administration Officer	Capt	5246	12e Regiment Blinde du Canada
124261	Instructor	LCdr	6018	Exchange Duty United Kingdom
261684	Task Force G3 Ops 2	Capt	6293	Task Force Kabul - NCE
265838	G3 NBC Officer	Capt	6293	Task Force Kabul - NCE

Table B-2 - Positions filled with Qualified Advanced NBC Defence Officers - 2004[186]

POSN	POSITION TITLE	RANK	UIC	UNIT
25700	Training Officer	Lt(N)	1347	CFFS Esquimalt
53147	BioScience Officer	Maj	2670	CFEME Toronto
53620	Commandant	Maj	2675	CFNBCS Borden
53622	Standards Officer	Capt	2675	CFNBCS Borden
53630	Chief Instructor	Capt	2675	CFNBCS Borden
53631	OC Training Platoon 2	Capt	2675	CFNBCS Borden
53633	OC Training Platoon 1	Capt	2675	CFNBCS Borden
63518	DMPOR 4-3	LCdr	3371	CMS Ottawa
13787	Comd Guidance Development	Maj	3929	DGJFD Ottawa
13788	Section Head - Policy/ Doctrine/Operations/Training	LCol	3929	DGJFD Ottawa
13790	Hazard Avoidance Chem-Bio	Maj	3929	DGJFD Ottawa

[186] Ibid., 3.

Annex C

Estimated NBC Defence Specialist Requirements - 2005

Table C-1 - Proposed NBC Defence Specialist Positions

Organization	Senior Officers	Junior Officers	Senior NCOs	Junior Ranks	Total
NDHQ Ottawa					
DCDS / DNBCD (Note 1)	18	6	1	1	26
ADM(MAT) / DGLEPM (2)	1	2	3		6
CMS Ottawa					
DMPOR (3)	1				1
MSRMS-4 NER (4)	1				1
DMRS 3-6-3 NBC Equipment (4)			1		1
CLS Ottawa / DLFR (3)	1				1
CAS Ottawa / D Air Support (3)	1	1	1		3
CFJOG Kingston					
Joint Operations Group HQ (5)	1	2	1	3	7
Joint JNBCD Coy (6)	1	10	17	90	118
MARLANT Halifax					
HQ (7)	1	1	1	3	6
CFNES (8)		1	6		7
Base Halifax - NER (9)		2	4		6
CF Maritime Warfare Centre (10)	1				1
MARPAC Esquimalt					
HQ (7)	1	1	1	3	6
CFFS Esquimalt (8)		1	3	2	6
Base Esquimalt-NER (9)		2	5		7
LFDTS and DGLCD Kingston					
DAD and DAT (11)	1	1			2
Peace Support Trg Centre (12)			1		1
Tactics School Gagetown (13)		1			1
LFAA Halifax					
Area HQ (7)		2	1	3	6
SQFT Montreal					
Area HQ (7)		2	1	3	6
5 GBMC Valcartier (14)		2	1	3	6
LFCA Toronto					
Area HQ (7)		2	1	3	6
2 CMBG Petawawa (14)		2	1	3	6

LFWA Edmonton					
Area HQ (7)		2	1	3	6
1 CMBG Edmonton (14)		2	1	3	6
1 CAN Air Div HQ Winnipeg (15)	2	1	1	3	7
Contingency Capability Centre (16)		1	1		2
1 Wing Kingston (18)	1				1
3 Wing Bagotville (17)		1	3	3	7
4 Wing Cold Lake (17)		1	3	3	7
8 Wing Trenton (17)		1	4	3	8
9 Wing Gander (18)		1			0
12 Wing Shearwater (17)		1			1
14 Wing Greenwood (17)		1	3	3	7
16 Wing Borden (18)					0
17 Wing Winnipeg (17)		1			1
19 Wing Comox (17)		1			1
22 Wing North Bay (17)		1			1
DRDC					
DRDC Suffield (19)	2	3			5
DRDC Toronto (20)		2			2
CFSTG Borden					
CFNBCS (21)	1	5	12	1	19
CFRG Borden					
CFRLS St Jean Instructors (22)		1	1	5	7
Out-of-Country					
NORAD HQ Colorado (23)		1			1
Exchange Duty UK(Phoenix) (24)	1				1
Total Officers	36	67			103
Total Non-Commissioned Members			80	144	224

Notes:

1. DNBCD strength is currently 16, and is expected to grow to 26 in the near future.
2. Numbers are based on those personnel currently working on NBC Defence equipment program and life cycle management in Associate Deputy Minister (Materiel) / Director General Land Equipment Program Management (DGLEPM).
3. DND, B-GJ-005-311/FP-001 *Canadian Forces NBCD Operations* (2000) ..., 3-9. ECSs are required to provide an NBC Defence POC who must be a qualified Advanced NBC Defence Officer as well as other officers in staff directorates (doctrine, training, requirements, etc). It has been proposed that three NBC Defence personnel be added to CAS.
4. A CMS staff officer coordinates Nuclear Emergency Response and operations. As well, there is a Chief Petty Officer assigned responsibility for Navy NBC Defence equipment.
5. DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations* (draft 2004) ..., 5-2-1. Every level of command above unit level requires an NBC Centre. The minimum manning for a deployable operational-level NBC Centre is at least ten personnel, including the Formation NBC Defence officer (Major), three NBC Centre duty officers, and three NBC Centre operators for 24 hour operation within an NBC environment.
6. ADM (HR-Mil), "Tabulation of Established Positions for a Department for Regular Force Peace and War Positions for 04849 - Joint NBCD Coy dated 27-JAN-2005," http://hr.ottawa-hull.mil.ca/dgmc/engraph/APS_e.asp; Internet; accessed 27 January 2005, and correspondence with the Commanding Officer(CO) Joint NBCD Coy on 16 December 2004.

Joint NBCD Coy personnel numbers do not include administrative or medical staff, and are based on the expansion of the unit to 150 with 32 support personnel.

7. DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations* (draft 2004) ..., 5-2-1. For a static operational level headquarters, the minimum requirement is the Command NBC Defence Officer (Major or Captain), two NBC Centre Supervisors/duty officers and three NBC Centre operators.
8. Numbers presented are based on current personnel being employed to instruct NBC Defence on a permanent basis at CFFS Esquimalt and CFNES Halifax.
9. The Halifax NER Team permanent staff consists of one officer as the NERO, one officer as the Scientific and Technical advisor and four Senior NCOs. The Esquimalt NER Team permanent staff consists of one officer as the NERO, one officer as the Scientific and Technical advisor and five Senior NCOs.
10. One position requires the Advanced NBC Defence Officer course but is currently vacant.
11. An NBC Defence specialist officer (Major) is currently employed in the Directorate of Army Doctrine to write Land Force NBC Defence doctrine and participate in international NBC Defence programs. Another NBC Defence specialist officer is required to coordinate Land Force NBC Defence training requirements and standards.
12. The Peace Support Training Centre has a requirement to conduct NBC Defence training on its courses, and consistently requests support from DNBCD, CFNBCS and the Joint NBCD Coy. An NBC Defence specialist NCO should be permanently on staff.
13. A position requiring the AIOM course was included in the establishment of the Tactical School, but then transferred to the Combat Training Centre Headquarters. NBC Defence specialist advice should be available to the four major training establishments at Gagetown.
14. DND, B-GJ-005-311/FP-010 *Nuclear Biological Chemical Defence Operations* (draft 2004) ..., 5-2-1 - 5-2-2. Tactical formations require an NBC Centre. An NBC Centre Supervisor and NBC Centre operator are required for every shift. This should be manned by the Formation NBC Defence Officer, another NBC Defence specialist officer, a Warrant Officer qualified NBC Centre Supervisor, and three NBC Centre operators, which allows for three shifts of two, or two shifts of three during intense operations.
15. 1 Canadian Air Division must be able to form an NBC Centre as an operational HQ and as part of NORAD. Currently two Majors and one Master Warrant Officer are being employed full-time in NBC Defence.
16. NBC Defence specialist personnel are required for pre-deployment NBC Defence training of Air Force personnel at the Contingency Capability Centre in Trenton ON.
17. DND, *Master Implementation Plan for the Implementation of Enhanced Wing Readiness Training Flights (RTFs) (draft)* (Ottawa: DND Canada, 2004), 3-A-1/10 to 3-A-10/10. Numbers include most of the Regular Force positions identified in this concept, and assumes that NBC Defence specialists are equally capable of performing refresher training on first aid, navigation, small arms, communications, and law of armed conflict.
18. NBC Defence specialist officers required at Wings in Kingston, Gander, and Borden.
19. DRDC Toronto conducts research on the impact of NBC Defence equipment on human performance. Many of the BioScience officers at DRDC Toronto take the AIOM course.
20. The Counter-Terrorism Technology Centre currently contains two officers supervising live NBC defence training. In the near future, another two officers will be added. In addition, a LCol position as Senior Military Adviser has recently been established at DRDC Suffield and could easily be filled by an NBC Defence specialist officer.
21. ADM (HR-Mil), "Tabulation of Established Positions for a Department for Regular Force Peace and War Positions for 02675 - CFNBCS dated 27-JAN-2005," http://hr.ottawa-hull.mil.ca/dgmc/engraph/APS_e.asp; Internet; accessed 27 January 2005. CFNBCS personnel numbers do not include administrative staff.

22. Canadian Forces Leadership and Recruit School, http://documents.cflrs.saint-jean.mil.ca/intranet/organisation/Academique.pd; Internet; accessed 27 January 2005. The CFRLS Academic Division contains an NBC/First Aid section of one officer, one Warrant Officer, and an actual NBC Defence instructional cell of six instructors.
23. A Canadian officer is employed on NBC Defence duties in NORAD Headquarters.
24. An exchange instructor position is currently filled by a MARS Lieutenant-Commander.

Table C-2 - Additional Positions for NBC Defence Specialists

Organization	Senior Officers	Junior Officers	Senior NCOs	Junior Ranks	Total
NDHQ Ottawa (Note 1)					
DCDS / J3 Arms Control	1				1
DCDS / J2 DSI		1			1
ADM (IE) / DGNS	1	1	1		3
CFJOG Kingston					
Joint Support Group HQ (2)		1	1	1	3
DART - NBC Def Officer (3)			1		1
CMS					
Sea Training Atlantic (4)			1		1
Sea Training Pacific			1		1
1 CAD Winnipeg					
Air Warfare Centre (5)	1				1
Vanguard NBCD CS (6)		1	5	32	38
CLS					
CMTC Wainwright (7)		1	1	1	3
1 Service Battalion Edmonton (8)		1	3	12	16
2 Service Battalion Petawawa (8)		1	3	12	16
5 Service Battalion Valcartier (8)		1	3	12	16
LFRR NBC Reserve units (9)		5	5	5	15
CDA Kingston					
RMC Instructors (10)	1	1			2
CFSTG Borden- Staff Officer (11)		1			1
DRDC Ottawa (12)		1			1
Officers	4	16			20
Non-Commissioned Members			25	75	100

Notes:
1. NBC Defence Specialists would be well trained for employment in arms control and counter proliferation duties, NBC intelligence, and radiation safety in National Defence Headquarters.
2. The Joint Support Group should contain its own NBC Defence staff.
3. The most recent enhancement of the Disaster Assistance Response Team (DART) included the addition of an Operations NCO whose primary duty was NBC Defence.

4. Sea Training organizations on the Pacific and Atlantic coasts are responsible for certifying the readiness of Canadian war ships before deployment. NBC Defence is a critical component and should be evaluated by qualified NBC Defence personnel.
5. Air Command intends to establish an Air Warfare Centre in the summer of 2005 to develop concepts and doctrine. Air power capabilities are dependent on infrastructure and protection, hence NBC Defence should be considered.
6. NBC Defence specialist personnel are required for a vanguard NBCD CS capability in the Air Force.
7. The Canadian Manoeuvre Training Centre will be training for the three-block war. NBC Defence specialists are required to implement NBC threats and hazards, and evaluate NBC Defence measures adopted by the training units.
8. The Land Staff are restructuring the Service Battalions within the Land Force Areas. These new Service Battalions will likely include a Laundry, Bath and Decontamination Platoon of 16 personnel, who should be NBC Defence specialists.
9. DND, *Army Chemical Biological Radiological and Nuclear (CBRN) Defence Capability* (CLS: file 1901-6-6 (CLS), 18 November 2003), M-1/11 - M-2/11. It is the intention of the Army to establish five to six company-sized elements that will fulfill the Army's NBC CS requirements by 2007/2008.
10. Given the science and engineering background required of NBC Defence officers, they would be ideally suited to fill several instructional billets at Royal Military College of Canada. This would support the post-graduate requirements of the NBC Defence occupation.
11. As the conduct of individual NBC Defence training is managed by CFSTG, it would be worthwhile to have a qualified officer on staff to act as the desk officer.
12. DRDC Ottawa’s radiological research and work with radiological sampling and identification would be ideal employment for an NBC Defence specialist.

Annex D

Selected Canadian Forces Occupation Sizes

Table D-1 - Selected Non-Commissioned Member Occupation Sizes by Rank[187]

Non-Commissioned Member Occupations	CPO1 CWO	CPO2 MWO	PO1 WO	PO2 Sgt	MS MCpl	LS Cpl	OS Pte	TOTAL
00019 Airborne Electronic Sensor Operator	5	24	39	75	29	31	0	203
00155 BioMedical Electronics Tech	0	1	2	4	9	1	0	17
00342 Clearance Diver	4	10	16	22	18	60	3	133
00335 Dental Tech	3	9	16	46	31	92	3	200
00302 Electrical Distribution Tech	0	0	3	24	21	45	23	116
00303 Electrical Gen System Tech	0	0	4	25	23	36	49	137
00238 Geomatics Tech	3	8	23	41	32	34	0	141
00137 Imagery Tech	3	7	7	45	63	81	31	237
00099 Intelligence Operator	3	10	70	101	59	56	1	300
00134 Material Tech	2	6	10	23	77	85	79	282
00100 Meteorological Tech	10	9	40	41	29	51	24	204
00152 Medical Laboratory Tech	0	2	3	10	13	2	0	30
00153 Medical Radiation Tech	0	1	3	8	11	3	0	26
00166 Musician	8	17	43	154	7	0	1	230
00343 Non-Destructive Testing Tech	1	0	2	5	14	31	0	53
00304 Plumbing and Heating Tech	0	0	2	19	19	68	27	135
00167 Postal Clerk	1	3	3	23	41	67	1	139
00301 Refrigeration and Mech Tech	0	0	3	18	20	47	28	116
00101 Search and Rescue Tech	3	8	12	68	38	27	1	157
00305 Water Fuel and Environment Tech	0	0	3	18	19	27	23	90
00307 Construction Engineering Supt	39	78	70	0	0	0	0	187
Proposed NBC Defence Specialist NCM Occupation	8		97		219			324

[187] Department of National Defence, Directorate of Human Resources Information Management, http://hr.ottawa-hull.mil.ca/dgmc/engraph/APS_e.asp; Internet; accessed 27 Jan 04.

Table D-2 - Selected Commissioned Officer Occupation Sizes by Rank[188]

Officer Occupation	Capt(N) Col	Cdr LCol	LCdr Maj	Lt(N) Capt	SLt Lt	A-Slt 2Lt	OCDT OCDT	TOTAL
00197 BioScience Officer	0	1	8	20	5	0	1	35
00200 Chaplain (P)	3	4	25	64	0	0	0	96
00201 Chaplain(RC)	1	4	22	48	0	0	0	75
00191 Dental	2	10	47	76	0	33	0	168
00192 Health Care Administrator	0	0	30	83	36	3	13	165
00193 Health Services Officer	6	21	33	0	0	0	0	60
00204 Legal	10	28	60	39	0	0	0	137
00210 Director of Music	0	1	4	5	3	0	0	13
00203 Public Affairs Officer	4	9	40	63	6	4	1	127
00194 Pharmacist	0	1	6	26	0	0	6	39
00190 Physiotherapy Officer	0	1	1	10	7	0	12	31
00208 Personnel Selection Officer	1	12	38	65	10	0	9	135
00198 Social Worker	0	1	7	18	9	0	4	39
00211 Training Development Officer	0	8	36	92	9	2	2	149
Proposed NBC Defence Specialist Officer Occupation	1	6	33	83	0	0	0	123

[188] Ibid.

Abbreviations and Acronyms

1 RDU	1 Radiation Detection Unit
AB	NBC Staff Officer course (qualification code)
ADM	Assistant Deputy Minister
ADM (IE)	Assistant Deputy Minister (Infrastructure and Environment)
AIOM	Advanced NBC Defence Officer course (qualification code)
CAS	Chief of Air Staff
CBIRF	USMC Chemical-Biological Incident Response Force
CBR	Chemical Biological Radiological (equivalent to NBC and CBRN)
CBRN	Chemical Biological Radiological Nuclear (equivalent to NBC and CBR)
CF	Canadian Forces
CFFA	Canadian Forces Fire Academy
CFFS	Canadian Forces Fleet School
CFNBCS	Canadian Forces Nuclear Biological Chemical School
CFNES	Canadian Forces Naval Engineering School
CFRLS	Canadian Forces Recruit and Leadership School
CFSTG	Canadian Forces Support Training Group
CJTL	Canadian Joint Task List
CLS	Chief of Land Staff
CMS	Chief of the Maritime Staff
CMTC	Canadian Manoeuvre Training Centre
CRS	Chief of Review Services
CSIS	Canadian Security and Intelligence Service
CTTC	Counter Terrorism Technology Centre
CW	Chemical Warfare
DART	Disaster Assistance Response Team
DCDS	Deputy Chief of Defence Staff
DGNS	Director-General Nuclear Safety
DNBCC	Director Nuclear Biological Chemical Coordination
DNBCD	Director Nuclear Biological Chemical Defence
DND	Department of National Defence
DRDC	Defence Research and Development Canada
ECS	Environment Chiefs of Staff
HQ	Headquarters
IAEA	International Atomic Energy Agency
IPE	Individual protective equipment
J2 DSI	J2 Defence Scientific Intelligence
Joint NBCD Coy	Joint Nuclear Biological Chemical Defence Company
LFRR	Land Force Reserve Restructure
MCF	Main Contingency Force
NATO	North Atlantic Treaty Organization
NCO	Non-Commissioned Officer
NCM	Non-Commissioned Member
NBC	Nuclear Biological Chemical
NBC Defence (or NBCD)	Nuclear Biological Chemical Defence
NBCD CS	Nuclear Biological Chemical Defence Close Support
NBCD GS	Nuclear Biological Chemical Defence General Support

NBCD IS	Nuclear Biological Chemical Defence Integral Support
NBCRT	Nuclear Biological Chemical Response Team
NCE	National Command Element
NCV	Nuclear-Capable Vessel
NER	Nuclear Emergency Response
NMSC	National Military Support Capability
NPV	Nuclear-Propelled Vessel
RCAF	Royal Canadian Air Force
RCN	Royal Canadian Navy
ROTA	Release other than Attack
RTF	Readiness Training Flight
SIBCRA	Sampling and Identification Biological Chemical Radiological Agents
TIH	Toxic Industrial Hazard
TIM	Toxic Industrial Material
UIC	Unit Identification Code
US	United States
WMD	Weapons of Mass Destruction

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