
2016 ANNUAL REPORT

Biological and
Chemical Defence
Review Committee

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Biological and Chemical Defence Review Committee

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**2016 ANNUAL REPORT
BIOLOGICAL AND CHEMICAL DEFENCE
REVIEW COMMITTEE**

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INTRODUCTION

The policy of the Government of Canada is to press for global, comprehensive and verifiable treaties banning all biological and chemical weapons. To this end, Canada is a State Party to the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction (the Biological and Toxin Weapons Convention or BTWC) and, to the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (the Chemical Weapons Convention or CWC).

However, for as long as the threat from such weapons endures, be they in the hands of state, or potentially, non-state actors, the Government has a recognized obligation to ensure that members of the Canadian Armed Forces (CAF) are adequately equipped and trained to protect themselves from exposure to biological and chemical warfare agents. Such protection is required not only during the course of operational deployments abroad, but also in the context of military support to responses to terrorist incidents at home or other domestic emergencies involving these agents.

This said, the Canadian public, as well as the international community, have the right to be assured that the Government's policy of maintaining only a defensive capability in this field is fully respected at all times and that any related research, development or training activities undertaken are conducted in a professional manner with minimal risk to public safety or the environment.

To facilitate this assurance, the Minister of National Defence (MND), in May 1990, directed the establishment of the Biological and Chemical Defence Review Committee (BCDRC or, "the Committee") as an adjunct to the Defence Science Advisory Board. Today, the BCDRC operates at arm's length from Government. Its mandate is to provide an independent, third-party review of the Biological and Chemical Defence (BCD) research, development and training activities undertaken by the Department of National Defence (DND) and the CAF with a view to assessing whether they are defensive in nature and conducted in a professional manner with minimal risk to public safety or the environment.

The BCDRC normally comprises three experts in scientific disciplines relevant to BCD such as chemistry, microbiology and toxicology. One of these is selected by the Committee to serve as Chair. New members are appointed by the Chair based on nominations from such professional societies and associations as the Royal Society of Canada, the Canadian Society of Microbiologists, the Chemical Institute of Canada and the Society of Toxicology of Canada. The Chair also arranges for an administrative staff member to function as the Committee's Executive Officer.

Committee membership as of 1 April 2016, was as follows:

Dr. Julia M. Foght (Committee Chair)

Professor Emerita of Microbiology

University of Alberta

Dr. Heather D. Durham

Professor of Neurology and Neurosurgery at the Montreal Neurological Institute and Hospital

McGill University

Dr. Pierre G. Potvin

Professor of Chemistry

York University

Brigadier-General (Ret'd) J.J. Selbie serves as Executive Officer to the Committee.

The Committee's annual cycle of activity includes:

- Briefings in Ottawa from representatives from National Defence Headquarters (NDHQ) and Global Affairs Canada (GAC) on BCD issues
- Visits to selected CAF education and training establishments, operational formations and units where BCD activity takes place, and to associated government (mostly DND) research and development facilities such as the Defence Research and Development Canada (DRDC) research centre at Suffield, Alberta (which is visited every year)
- Attendance at selected BCD exercises, training courses, workshops, seminars, symposia, etc., conducted by the CAF or DND
- Publication of an Annual Report in the public domain with key observations, findings and recommendations

The Committee's Annual Reports, dating back to 1991, are available on its website (www.bcdrc.ca). No report was produced in 2010 due to a delay in renewing the Committee's mandate.

The work of the Committee is funded by a contribution from the Government of Canada Department of National Defence.

SUMMARY

Having detected no evidence to the contrary during its 2016 briefing and visit programme, the Committee concludes that:

- Canada's policy of maintaining a purely defensive biological and chemical warfare capability is fully respected by the DND and the CAF.
- The BCD research, development and training activities undertaken by the DND and the CAF are compliant with Canada's obligations as a State Party to the BTWC and to the CWC.
- The BCD research, development and training activities undertaken by the DND and the CAF, as observed by the Committee, pose minimal risk to public safety or the environment.
- There is no covertness or duplicity within the BCD program.
- In addition to its principal conclusions, the Committee, drawing upon its observations made during the course of its visits to DND and CAF education and training establishments, operational formations, units and research and development facilities, offers, in addition to our outstanding recommendations, one new recommendation aimed at reinforcing the good management and effectiveness of Canada's BCD program.

COMMITTEE ACTIVITIES 2016

During 2016, the Committee conducted the following briefings, visits and related activities:

- **DRDC Chemical Biological Radiological and Nuclear (CBRN) Oversight Committee (7 March).** The BCDRC Executive Officer observed a meeting of the Oversight Committee at which the Committee's terms of reference were confirmed and a CBRN Material Risk Management Framework approved.
- **DRDC Suffield Research Centre (SRC) (3-5 May).** The Committee's visit to the SRC incorporated a full program of presentations, discussions, information exchanges and verification activities including the following:
 - An overview presentation by the Centre Director covering organization, infrastructure, resource allocation, notable initiatives and other activities undertaken during the past year including inter-departmental and international involvements
 - A presentation and discussion of the current BCD research and development program at the Centre and specialized BCD training delivered at the Counter Terrorism Technology Centre (CTTC)
 - A presentation and discussion of recent and current initiatives in their programs related to safety and environmental stewardship

- A presentation and discussion of infrastructure and other corporate services issues related to safety and environmental protection
- A review and discussion of local developments concerning relevant recommendations contained in the BCDRC 2015 Annual Report
- Review and discussion of various biological and chemical warfare agent (BWA and CWA) threat issues
- Review of Material Transfer Agreements executed between 1 May 2015 and 30 April 2016
- Review of all BCD contracts awarded to outside agencies
- Review and discussion of chemical holdings, including management protocols and procedures, and an inspection of chemical holdings and laboratory facilities
- Review and discussion of the Chemical Safety Program
- Review and discussion of microbiological, viral and toxin holdings, including management protocols and procedures, and an inspection of Biosafety Level 2 (BSL 2) microbiological, viral and toxin holdings and laboratory facilities
- Video inspection of selected agent holdings in Biosafety Level 3 (BSL 3) facility
- Review and discussion of the transfer to authorized recipients of pathogenic biological materials between 1 May 2015 and 30 April 2016 including procedures for control and tracking by receiving agencies
- Review and discussion of the Biological Safety Program
- Contractor briefings
- Informal laboratory visits and research and development project briefings
- Review of Animal Use Protocols
- Tour and discussion of activities at the CTTC's Cameron Centre training facility
- Review and discussion of the discovery and safe disposal of legacy munitions at CFB Suffield suspected to contain CWA
- Private meetings with the General Safety Officer, Chair of the Biohazard Safety Committee and the Chair of the Chemical Safety Committee
- Meeting with staff from the Base Medical Section
- Meeting with the Commander of CFB Suffield
- An opportunity for SRC staff to meet in confidence with the Committee
- In concluding the visit, the Committee debriefed the Centre Director and his executive management team on its initial observations and conclusions.

- **Canadian Food Inspection Agency (CFIA) Lethbridge Laboratory (6 May).** By kind invitation of the CFIA, we visited the Agency's Lethbridge Laboratory where we learned of research undertaken in support of the maintenance of the security of Canada's food supply including work aimed at rapidly detecting and identifying biothreat agents in food.
- **2 Air Expeditionary Wing (2 AEW) - Bagotville (3 June).** Discussions with the Wing Commander and CBRN specialist staff afforded us an insight to the RCAF's expeditionary capability and measures aimed at defending deployed air forces against biological and chemical warfare threats.
- **DRDC Valcartier Research Centre (VRC) (6 June).** The Committee received an overview presentation on the VRC from the Centre Director as well as a tour of facilities and presentations on BCD-related projects in the realms of Tactical Surveillance and Reconnaissance; Spectral and Geospatial Exploitation; and Situational Awareness Enhancement for CBRN-affected Theatres of Operation. BCD research- and development-related aspects of the Centre's environmental stewardship and health and safety programs were also discussed.
- **Royal Military College (RMC) – Kingston (7 June).** The Committee received a presentation on BCD research at the College as well as CBRN Defence-related academic offerings. A laboratory tour followed.
- **Canadian Joint Incident Response Unit – Chemical, Biological, Radiological and Nuclear (CJIRU-CBRN) – Trenton (7 June).** The Committee discussed with the Deputy Commanding Officer and other staff the unit's recent activities and current situation; witnessed a training exercise; and toured a display of in-service equipment all aimed at updating the Committee's understanding of the capability of the CJIRU-CBRN and its approach to training and training safety.
- **Assistant Deputy Minister Policy – NDHQ Ottawa (8 June).** With the assistance of GAC representatives, the Committee was updated on changes to the strategic security environment as well as the status of the CWC and BTWC, including an update on compliance by the DND and the CAF. The Committee was also briefed on recent counter-proliferation support and other threat reduction activities conducted under the auspices of the GAC-led Global Partnership Program. Finally, a representative from the Public Health Agency of Canada's Centre for Biosecurity provided a presentation on the implementation of the Human Pathogens and Toxins Act and the complementary Human Pathogens and Toxins Regulations.
- **Chief of Force Development – NDHQ Ottawa (8 June).** Officers of the Directorate of Chemical, Biological, Radiological and Nuclear Defence (D CBRN D) updated the Committee on the role and changes to the organization of the Directorate and the status of the BCD equipment procurement projects. We were also informed of the divestment of obsolete equipment.

- **DRDC Centre for Security Science (CSS) - Ottawa (9 June).** The Committee received an update on the BCD aspects of the Canadian Safety and Security Program (CSSP), which is led by the CSS in partnership with Public Safety Canada.
- **Canadian Forces Health Services Group Headquarters (CFHS Group HQ) – Ottawa (9 June).** We met with the Surgeon General and his staff who briefed the Committee on their response and follow-up to our recommendations in recent annual reports; CFHS Group BCD-related activities over the past year; operational medicine priorities for BCD research and development; regulatory affairs developments; and, the status of the Biological Weapons Threat Medical Counter-Measures (BWTMCM) project.
- **DRDC Corporate Office - Ottawa (10 June).** The Committee met with Dr. Camille Boulet, Chief of Staff to the Chief Executive Officer DRDC and Assistant Deputy Minister (Science & Technology) (ADM (S&T) and several DRDC subject matter experts. Agenda items included an update on the work of DRDC’s CBRN Oversight Committee and discussion of corporate-level safety and risk management arrangements; a presentation on the current BCD-related research and development program including project charters, resource allocation and the provision of certificates of compliance with DND/CAF CBRN defence policy; and, a summary of DRDC participation in BCD-related inter-departmental and international fora. We also discussed the status of the response to recommendations in the Committee’s 2015 Annual Report. Finally, the Committee Chair de-briefed Dr. Boulet on preliminary observations made during our 2016 round of visits.
- **Exercise PRECISE RESPONSE – Suffield - (25 July).** The Committee Chair and Executive Officer, on behalf of the Committee, observed the conduct of PRECISE RESPONSE, a NATO training activity carried out annually, at SRC’s CTTC and aimed at further developing NATO’s capacity for the detection, identification, sampling and decontamination of CBRN agents. This year’s exercise involved 350 participants from ten nations.
- **Advanced CBRN Defence Officer Course – Ottawa (29 September).** At the invitation of the Canadian Forces Fire and CBRN Academy, Dr. Durham gave a presentation on the work of the BCDRC.
- **CBRN Defence Workshop – Ottawa (15-17 November).** The Committee’s Executive Officer attended this workshop, which brought together representatives of the various DND and CAF stakeholders in CBRN Defence for an exchange of information on current activities and issues.

OBSERVATIONS

General. The Committee was warmly welcomed and received complete and proactive cooperation of authorities at all the headquarters, units, agencies and sites visited. The presentations and other information packages received were relevant, focused and detailed.

Threat. The briefings that the Committee received from Canadian Armed Forces Intelligence Command attested to continued credible biological and chemical warfare threats from both state and non-state actors, which necessitate appropriate defensive preparedness.

Defensive Capability. During its briefings and visits, the Committee had occasion to view capability requirements and procurement plans; research and development facilities and activity; in-service equipment and other materiel; doctrine; and, training. In all instances, the Committee was satisfied that these pertained solely to the defensive functions of biological and chemical agent detection, identification and monitoring; information management (e.g., warning and reporting); protection; hazard management (e.g., decontamination); and, medical counter-measures (MCM). The Committee assesses such functions as being consistent with the maintenance of a purely defensive capability.

Compliance with Policy and International Conventions

DND/CAF chemical and biological defence policy is set out in Defence Administrative Order and Directive (DAOD) 8006-0 (accessible on the Internet). During our visit to the DRDC Corporate Office on 12 June 2016, the Committee received written certification from the Director General Science and Technology – Centre Operations, the Acting Director General Science and Technology - Force Employer and the ADM S&T that the projects in the FY 2016-16 DRDC Canada R&D program related to BCD, and for which they are responsible, are compliant with the provisions of DAOD 8006-0.

The Committee was also provided copies of the CBRN Research Program Project Charters, which include detailed project descriptions and resource allocations.

From time to time, the Organization for the Prohibition of Chemical Weapons (OPCW) conducts verification inspections of Canadian chemical defence research and development facilities. The most recent of these, an inspection of the Canadian National Single Small-scale Facility (CNSSSF) at the SRC, was conducted on 14-15 September 2015. During our visit to Suffield in May 2016, we examined the inspection report, which indicated the CNSSSF to be fully compliant with Canada's obligations pursuant to the CWC.

It should be noted that occasionally, due to historical activities at CFB Suffield, legacy munitions meriting treatment as suspected chemical weapons are found on the restricted-access experimental proving ground or in the military training area at Suffield. These munitions are reported to NDHQ and the OPCW and permission requested for their destruction. The latest information the Committee has in this connection is the report of the destruction on 11 May 2016 of the suspect aerial spray tank discovered on 24 July 2015, noted in the BCDRC 2015 Annual Report.

Safety

The Committee observed that at all units and locations visited in 2016, there exists a positive culture of safety and environmental stewardship.

Based on our discussions with the SRC General Safety Officer and the Chairs of the Biohazard and Chemical Safety Committees, we believe that these committees continue to operate effectively.

Holdings of microbiological, viral and toxin samples at SRC were inspected and verified. There were neither significant discrepancies nor any associated safety concerns. Biological holdings, including soil samples and particularly toxins, continue to be reduced to the minimum required for current defensive research. To date several hundred vials of excess stock have been destroyed. In this connection, the inventory management information system, introduced a few years ago, continues to operate as it should, with newly acquired samples being properly barcoded and good progress being made to complete the barcoding of legacy holdings including all toxins. By the spring of 2017, all samples in the SRC inventory are expected to have been entered and tracked in the system.

Consequent to the identification by US suppliers of inactivated anthrax that could no longer be trusted as inactivated, SRC reported that they have modified inventory and laboratory procedures to include special handling and tracking of such inactivated material.

On 1 December 2015, new regulations under the Human Pathogens and Toxins Act came into effect. New Canadian Biosafety Standards are also now in force. We understand that SRC is revising its laboratory procedures to ensure compliance, and look forward to receiving from the Centre a copy of their updated biological laboratory operating manual when this work is done.

The Committee observed that control and accounting procedures for chemical holdings remain satisfactory, strengthened as they were last year by the establishment of limits on the amount of agent that can be synthesised on strictly local authority, and by new provisions for the destruction of samples or sub-stocks of agent upon the completion of projects and exercises. We also appreciated the effort made, for our benefit, to extend the video inspection capability (which we use to help us verify biological holdings) to assist us with verification of chemical holdings as well.

Last year, the Committee closed, as having been adequately addressed, our 2011 Annual Report recommendation concerning the synthesis and holding of small amounts of CWA at the RMC. During this year's visit to the College, we verified that its relevant license has been amended to preclude synthesis and to restrict its holding to the very small amount of stipulated CWA required for analytical science and protective research purposes. Furthermore, we confirmed that arrangements would be made to replenish this holding through the CNSSSF at the SRC as required. Finally, we inspected the laboratory where the holding is stored and assessed as satisfactory both the facility and the prescribed procedures for handling the material.

During our 2012 visit to SRC, we were briefed on the launch of a Chemical Safety Review, the mandate of which was to compare current local procedures with best practices in allied defence laboratories with a view to identifying gaps or deficiencies at Suffield and making recommendations for their rectification. Amongst the recommendations of the since-completed Review were proposals to establish a Chemical Safety Officer position; to standardize safety procedures and equipment across laboratories; to improve training and certification procedures

for chemical agent workers; to increase agent security; to better define risks associated with various laboratory operations; to dedicate resources to ensuring consistent compliance with chemical safety policies; to modify certain emergency response procedures; to consider provisions for the enhanced assurance of appropriate medical support; and, to investigate the implementation of a Medical Surveillance Program to include monitoring of acetylcholinesterase (AChE) levels in pertinent laboratory personnel. These recommendations continue to be implemented, with the remaining effort focused on agent-worker certification, AChE testing, and the hiring of a chemical safety officer as follows:

- As of May 2016, all personnel requiring agent-worker certification – both laboratory workers and field safety staff – had been re-certified at the basic level. Beyond the basic level, certification will be conducted in two streams: laboratory and field safety, in accordance with the workers' needs. Next-level training and testing materials are now being prepared.
- An AChE Monitoring Program based on a UK model has been endorsed and a pilot program approved and executed. Full implementation of the program is expected in 2017.
- The work description for a full-time Chemical Safety Officer has been completed and submitted to the DRDC Corporate Office for position classification and staffing. In the meantime, the duties of the position are being executed on a part-time basis by an existing staff member.

Emergency response exercises continue to be regularly conducted at SRC. A full-scale chemical emergency response exercise involving a Casualty Management Section laboratory in Building 10 was conducted in February 2016 while a second exercise, in response to a simulated event in the CNSSSF in Building 1 was conducted on 23 March 2016. We understand that “tabletop” exercises and “walk-throughs” are conducted in advance of each full-scale exercise. This constitutes good practice and we commend Centre management for embracing it.

Although unforeseen scheduling difficulties precluded the Committee observing a safety exercise during this year’s visit, we will press for this opportunity in 2017. In the meantime, we have reiterated our suggestion that future chemical emergency response exercises include, in addition to the CNSSSF, other laboratories where chemical agent may be used. We also believe that an exercise scenario based on a road accident involving a vehicle transporting agent to the Cameron Centre training site would be of value. Finally, we discussed with the Centre Director the advisability of posting, in relevant laboratories, a document indicating the date of the last emergency response exercise as an aid to maintaining a reasonable exercise frequency.

The live-agent training we observed during Exercise PRECISE RESPONSE, we believe, was conducted in a safe and professional manner and illustrated effective collaboration amongst participants, as well as between the training audience and the exercise control and safety staff.

The SRC is a strategic national asset and, as such, its infrastructure deserves commensurate care and attention. The main laboratory building, Building 1 (which also houses the Centre’s

administrative offices), is close to sixty years old and, as long ago as the Barton Report of 1988, it was identified for replacement. Apart from the age of the building, the Committee has harboured a long-standing safety concern about the co-location of scientific and administrative functions. The coming into force of new regulations under the Human Pathogens and Toxins Act and the new Canadian Biosafety Standards may give rise to additional concerns. Our unease has been mitigated, to an extent, by the diligent attention of SRC management and employees to building maintenance and safety including emergency response exercises; by the prospect of the construction of a new laboratory complex; and, most important, by the proposal to place new modular BSL 3 laboratories in the shell of a nearby building (the so-called Modular Biological Containment Facility (MBCF)) pending their ultimate relocation to the new complex. The Committee follows closely the progress of the MBCF project. We understand that, with the transfer in 2014 of Suffield real property responsibilities from the Army to ADM Infrastructure and Environment (ADM IE), both projects have been subject to re-definition requirements and, also, re-prioritization in competition with other proposed projects from across the country. It is now estimated that approval to commence detailed facility design will be granted in December 2017 at the earliest and with interim relocation of the biological laboratories occurring no sooner than 2022.

Further highlighting this issue, on 14 August 2015, Building 1 experienced a power outage due to a catastrophic failure of the main power supply to the building. The emergency power generator activated normally, thus maintaining the operation of the BSL 3 laboratory HVAC system. However, on 16 August and again on 17 August, the emergency generator ceased operation resulting in a loss of negative pressure in the BSL 3 laboratory – a significant incident with potentially serious consequences. In accordance with regulations, the incident was reported to the Public Health Agency of Canada. Although negative pressure was soon restored and no ill effects were suffered by personnel, the laboratory remained unoccupied until the re-establishment of house power on 11 September. This occurrence underlines the elevated risks associated with the age of Building 1 and the co-location of biological containment and administrative facilities and should, the Committee believes, give added impetus to the full recapitalization of SRC's facilities.

In 2013, the DND Chief of Review Services conducted an audit of the handling of CBRN material across DRDC. This audit generated several recommendations aimed at further strengthening in-place processes and controls intended to mitigate the risks associated with this activity. These recommendations were accepted by DRDC and the Committee has been pleased to observe the speed with which they have been implemented:

- A DRDC Corporate Safety and Environmental Management System (SEMS) to address safety and environmental risks associated with DRDC operations has been designed. SRC has commenced integration of its existing Health and Safety and Environmental Management Systems in accordance with the requirements of the SEMS.
- As we reported last year, Dr. Marc Fortin (ADM S&T) has designated his Chief of Staff (Dr. Camille Boulet) as the National Authority responsible for the oversight and provision of

direction related to the compliance, control and risk management of CBRN activities. To assist the National Authority, a DRDC CBRN Oversight Committee has been established and has met twice.

- The CBRN Oversight Committee has approved a CBRN Material Risk Management Framework which describes DRDC's organizational assets; categorizes the threats to these assets; assigns responsibilities for risk management; and, establishes a set of facility, personnel and material risk indicators and corresponding risk management performance indicators.
- As mentioned previously in this report, inventory records of chemical agents are now being tracked from procurement to disposal.

Given the nature of the research and development undertaken at SRC, the occupational health and potential emergency medical support needs of the Centre are relatively specialized and complex. During recent annual visits, we have become aware of several seemingly problematic aspects of the Centre's situation in this regard and the challenges to which they, from time to time, give rise. We have also learned of the diligent and effective efforts of the many stakeholders involved to confront and overcome these challenges with a view to maintaining the completeness and consistency of the required support system. This said, we have also noticed a tendency for issues to re-emerge due to circumstances beyond local control *e.g.*, the retirement of the contracted medical advisor, changes in military medical personnel, modifications to special treatment protocols, and the commercial availability of MCM. The Committee believes that a comprehensive assessment of occupational health and emergency medical support needs, including verification that these needs are being met, should be conducted by an appropriate high-level authority with the possible participation of relevant stakeholders (*e.g.* SRC, CFB Suffield, CFHS Group, 3rd Canadian Division, Health Canada, Alberta Health Services, *etc.*). The objective of this undertaking should be to ensure the long-term adequacy and stability of these essential supports to the work of the Centre.

Environmental Protection

The environmental protection program at SRC continues to run well. An audit of the Environment Management System was completed last year and five new environmental management standard operating procedures have been implemented. Like the General Safety Officer, the Environmental Officer now reports to the Centre Director.

The Committee again commends the environmental assessment process in use at VRC which offers a simple but thorough and effective means of helping to ensure that, for all field tests, the risks to the environment, the eco-system components which may be impacted and the suitable mitigation measures are identified, considered and, as appropriate, implemented.

Other Observations

- **SRC/CFB Suffield**

- The Centre Director at Suffield informed us of the status of recent corporate and local initiatives aimed at improving the DRDC and SRC business models and working environments. One of these – the DRDC Capability Review, which sought to identify those parts of the defence science and technology program meriting re-direction or expansion – has been put on hold, pending completion of the Government’s Defence Policy Review. The CBR Memorandum of Understanding (MOU) amongst the “4 Eyes” nations (Australia, Canada, the United Kingdom and the United States) remains the primary venue for international collaboration in the chemical and biological domain. New possibilities for collaboration are being explored with other countries but these will be restrained by resource availability. The past five years have been, in large measure, characterized by a reduction in resources allocated to BCD. The extent to which this could diminish the leverage that Canada has traditionally obtained from its international engagement is yet to be determined. The Committee commented on this risk in our 2015 report and will continue to monitor this issue closely. In any event, we will likely observe, in the short term, efforts to identify and focus on “niches” where Canada’s contributions will generate the most value. Current Canadian leadership of efforts to develop MCM for ricin may represent one such niche.
- *Eximius Ordo* (“in a class of its own”) is the name applied to the locally led process to evolve and modernize SRC (as it celebrates its 75th anniversary) with a view to maximizing its impact on the delivery of the defence science, technology and knowledge priorities within DRDC. We look forward to learning of the early results of this undertaking during next year’s visit.
- The SRC Director also drew our attention to the looming retirements of some of SRC’s most experienced and knowledgeable staff. He identifies these departures, in company with the Centre’s aging infrastructure, as the leading risks to the successful execution of its mission. An orderly succession plan including the timely hiring of new staff constitutes the obvious mitigation strategy for the “retirement risk”. Implementation of this strategy deserves active DRDC corporate support and follow-up by the Committee during future visits.
- **CFIA Lethbridge Laboratory.** The Committee appreciated the opportunity to visit CFIA’s Lethbridge Laboratory and to learn of the Laboratory’s involvement in projects sponsored by the DRDC-led Canadian Safety and Security Program. We were particularly impressed by the quality and capability of the laboratories and other facilities, and the training opportunities provided to young scientists. We left with an enhanced understanding and appreciation of the unique contribution of the CFIA to the health and security of Canadians.
- **2 AEW Bagotville.** Efforts to build the RCAF’s expeditionary capability comprise some 17 related projects. The principal home of this capability is 2 AEW in Bagotville, Quebec, and our visit there left us in no doubt of the significant progress that has been achieved. The

specific purpose of our visit was to gain an understanding of the tactical-level BCD capability possessed by the Wing. Although this capability is in its infancy and is limited by the small number of personnel assigned to it, there is no doubt that it is being taken seriously. The Wing is in possession of equipment and systems for detection, monitoring, integration and decision support. Opportunities are being exploited to apply and expand the Wing's knowledge of their operation and employment through participation in exercises at the local, Canada-US and NATO levels. The CBRN Defence cell at 2 AEW has also established a connection to the "reach-back" expertise available at SRC and is receiving decontamination instruction from the Army in Valcartier. Also helpful to the development of BCD capability and capacity, was the issuance in June 2016 of a 1 Canadian Air Division order specifying CBRN Defence operation and staff responsibilities applicable not only to 2 AEW but to all Wings in the Division.

- **DRDC VRC.** Development of long range stand-off biological and chemical detection systems continues apace at the VRC and is yielding exciting world-leading results. Recent field trials (using agent simulants), aimed at determining the synergy to be derived from the co-deployment of sensors, have also produced very promising results underlining VRC's emerging leadership in the field of sensor integration. Moreover, a related project dealing with command and control situational awareness points to detection, monitoring and decision support as a possible Canadian "niche" in the BCD community. There appears to be potential for application of this integrated capability in the public safety domain, where the concern is industrial hazard rather than warfare threat agent.
- **RMC.** RMC is adding to the scope and value of its contribution to Canadian security and defence by virtue of its CBRNE academic course offerings which, it is proposed, will soon be combined into a certificate-level program. We also note the expert participation of the Analytical Sciences Group in evaluations of chemical agent legacy sites in the region.
- **CJIRU-CBRN.** Given its specialized capability in the realm of detection, identification and mitigation of chemical, biological and other hazards, the CJIRU-CBRN is a distinctively valuable national asset. The aim of the Committee's visit was to update its understanding of the unit's role and capability and its approach to maintaining the safety of its members and the public during training. This aim was easily achieved thanks to the comprehensive visit programme prepared for us and the informative discussions we enjoyed with the unit members we met. The expertise, dedication and maturity exhibited by all struck us as being of a very high standard. The inclusion this year of the chance to observe a training exercise based on a typical mission scenario allowed us to view unit members "in action" and provided excellent insight to how the various roles, skill-sets and technologies combine to achieve the desired outcome. We were pleased to hear that the relationship between the unit and SRC is strong and productive, including the use by the unit of equipment and procedures developed by DRDC. As a follow-up to our previous visit, we noted that a desired MOU between the CAF and the RCMP regarding inter-agency

operations is about to be signed, which will facilitate requests for the assistance of the CJIRU-CBRN submitted by the RCMP.

- **NDHQ**

- As in previous years, transparency and frankness typified our talks with policy staff at NDHQ and with personnel from GAC, who spoke with us not only about the status of the BTWC and CWC, but also, as they have generously done before, the state of the Global Partnership Program [now termed the Weapons of Mass Destruction (WMD) Threat Reduction Program] created to address WMD proliferation risks.
- The Chief of Force Development's Directorate of CBRN Defence at NDHQ is responsible for the development of joint CBRN defence capabilities to enable the armed forces to survive and operate in a CBRN-contaminated environment at home or abroad. In this connection, one of its principal tasks is the provision of guidance to DRDC with respect to the BCD R&D program. The Directorate remains most helpful to the work of the Committee, having this year provided us with an update of completed, divested, active and proposed projects. However, we noted that none of the proposed BCD projects is yet included in the DND/CAF capital investment program and, as such, are currently not funded.

- **CSS**

- At the CSS, we were again provided with a comprehensive and insightful update of the CSSP with an emphasis on its BCD aspects. The program's mandate is to strengthen Canada's ability to anticipate, prevent, mitigate, prepare for, respond to, and recover from natural disasters, serious accidents, crime, and terrorism through the convergence of science and technology with policy, operations, and intelligence. The CSSP supports federal, provincial, or municipal government-led projects in collaboration with response and emergency management organizations, non-governmental agencies, industry, and academia.
- We learned that the previous "communities of practice" approach to organizing the work of the program (and which, thus, included standalone biological and chemical portfolios) has been set aside in favour of a distributed and integrated approach. While this would appear to make sense, we will remain alert to the potential erosion of BCD research and development capability.
- We also learned of a new interest in centrally sourcing on-demand scientific advice to governments in case of emergency, especially in the US and in the UK, where a Scientific Advisory Group for Emergencies (SAGE) was stood up in 2015. We wonder what impact this may have on the profile of the scientific "reach-back" function exercised by DRDC, noting that SRC provides a reach-back service, but not necessarily on a 24/7 basis due to resource limitations. In this vein, we also learned of the interest of D CBRN D in contributing personnel to the NATO CBRN

Centre of Excellence in the Czech Republic. We understand that a contribution of this sort would entitle Canada to access to the 24/7 reach-back capability of the Centre.

- **CFHS Group HQ**

- During our visit, we learned of current issues and developments with respect to BCD medical doctrine; training course development; chemical agent treatment protocols; and, as mentioned above, efforts to address SRC's reported medical support requirements. We were also briefed on the Surgeon General's BCD research and development priorities that include: new or improved MCM against CW and BW agents; clinical treatments to lessen tissue damage and restore function after CWA exposure; an evidence base for chemical and biological medical assessment and treatment protocols; diagnostics; and, research that enhances MCM production or facilitates regulatory approval for CAF use.
 - The mandate of the CFHS Group HQ Regulatory Affairs Section is to ensure adherence to Health Canada and DND regulations for the reporting, accounting and handling of unlicensed medical products; to advise on regulations for their use; and, to seek Canadian regulatory approval for them, where feasible. We observed that the section remains proactively, energetically and fully engaged in obtaining regulatory approval under Health Canada's Extraordinary Use New Drug policy and Special Access Program covering an impressive range of BCD-related products.
 - We salute the progress of the BWTMCM project including its first product licensing successes and its role in the development of a FilmArray bio-threat detection system.
- **Ex PRECISE RESPONSE.** In hosting Exercise PRECISE RESPONSE, Canada continues to honour its commitment, made at the 2002 NATO Summit in Prague, to provide our Allies with a safe and secure site for live-agent CBRN Defence training. Based on our interviews with members of several of the multi-national teams formed for the exercise (including those led by Germany, France and the Netherlands), this is a highly-valued opportunity.
 - **CBRN Defence Workshop.** The annual CBRN Defence Workshop, organized and chaired by the Director of CBRN Defence, is a valuable forum for activity coordination and information exchange amongst the members of the Canadian CBRN Defence community. This year we learned that the DND/CAF contingency plan for response to a domestic CBRN emergency has, at long last, been approved. We were also informed of the decision to place the Directorate of CBRN Defence under the Commander of the Canadian Army. The Committee will be alert to any impact this change might have on the development of BCD capabilities in the RCN and RCAF.

CONCLUSIONS

Having detected no evidence to the contrary during its 2016 briefing and visit activities, the Committee concludes that:

- Canada's policy of maintaining a purely defensive biological and chemical warfare capability is fully respected by the DND and the CAF.
- The BCD research, development and training activities undertaken by DND and the CAF are fully compliant with Canada's obligations as a State Party to the BTWC and CWC.
- The BCD research, development and training activities undertaken by DND and the CAF pose minimal risk to public safety or the environment.
- There is no covertness or duplicity within the BCD program.

RECOMMENDATION

The Committee this year offers one new recommendation:

A comprehensive assessment of Suffield Research Centre's unique occupational health and emergency medical support needs should be conducted under the leadership of an appropriate high-level authority with the possible participation of relevant stakeholders (*e.g.*, SRC, CFB Suffield, 3rd Canadian Division, CFHS Group, Health Canada, Alberta Health Services, *etc.*). This same authority should also take the lead in designing and implementing cooperative, long-term solutions to any gaps so identified.

STATUS OF COMMITTEE RECOMMENDATIONS

Please see Annex A for DND/CAF responses to Committee recommendations.

ANNEXES

A – Status of Recommendations

B – Acronyms and Abbreviations

STATUS OF COMMITTEE RECOMMENDATIONS

1. ***(2011) DRDC Suffield should continue to reduce its biological, viral and toxin holdings to the minimum required for current research and that it complete as soon as possible procurement of specialized software and management tools for inventory management.***

DND/CAF Response (March 2012): “In 2011, DG DRDC Suffield directed: the completion of a full inventory of all biological, viral holdings; minimization of all holdings to levels that are sufficient to support current and future program requirements and the destruction of surplus materials. This task is expected to be completed by 29 February 2012. The updates to the inventory management software have been received and implemented.”

BCDRC Comment (November 2012): Good progress is being made but some work remains to be done with respect to further reductions and inventory management tools. We will continue to monitor.

DND/CAF Response (April 2013): “DND/CF DRDC Suffield continues to annually review holdings of bacterial, viral and toxin stocks, and reduce the number of redundant stocks to minimal amounts sufficient to support current and future program requirements. The updates to the inventory management software have been implemented and improvements and progress continue to be made.”

BCDRC Comment (December 2013): We commend the progress made to date while noting that the inventory management system has not yet been fully implemented. We will continue to monitor.

DND/CAF Response (February 2014): “The inventory management software has been completely updated. DRDC Suffield is currently relabeling all Bio Safety Level 3 stock inventories with database-generated bar-code labels. Concurrently, a complete inventory check of all stocks is also underway to ensure accurate holding records. The anticipated completion date for this phase is the end of April 2014.”

BCDRC Comment (December 2014): We acknowledge that the inventory management software is now performing correctly; that new samples added to holdings are properly bar-coded and that work aimed at bar-coding legacy stocks is progressing. We will continue to monitor progress during our annual visits and encourage reductions where possible.

DND/CAF Comment (July 2015): “The inventory software is working well without issues. Approximately half of the viral holdings have been barcoded to date and the current viral holdings are being reviewed to see if further reductions can be made. The labelling process for bacterial holdings has just begun. The labels have been printed and are ready to be affixed awaiting the availability of technical staff required for completion. A reduction of the anthrax agar slants and soil samples is also underway with plans to progress this work over the next year.”

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BCDRC Comment (December 2015): We acknowledge this good progress and will continue to monitor efforts to further improve the management of holdings including their reduction to the minimum required.

DND/CAF Comment (September 2016): “Inventory of all biological holdings continues to progress, and the review of viral holdings has been completed. Holdings are reviewed annually and recommendations are made for reductions where appropriate. As a result of the identification by US suppliers of inactivated anthrax that could no longer be trusted as inactivated, our inventory procedures have been modified to track all inactivated material as well. It is estimated that the inventory will be completed by spring 2017. To date, several hundred vials of excess stock have been destroyed.”

BCDRC Comment (December 2016): We look forward to the inclusion of all holdings in the inventory in the Management Information System.

DND/CAF Comment (April 2017): DRDC Suffield has completed all viral and toxin inventories and only bacterial holdings remain to be entered into the inventory tool. In order to complete this activity, approximately 75% of the bacterial holdings require labels to be affixed. This is scheduled to be completed by October 2017. The inventory of all uncertain inactivated materials is now complete.

Status: OPEN

2. (2011) NDHQ and DRDC should support, as requested, DRDC Suffield’s initiative to conduct a comprehensive external review of its safety and environmental stewardship programs.

DND/CAF Response (March 2012): “DRDC Suffield has initiated a multi-phased program aimed at modernizing its safety practices. A review of our allies’ chemical safety programs and waste management processes has been completed and compared to established policies and programs. The recommendations from this process are undergoing an internal review, prior to forwarding to the DG of DRDC Suffield for approval. In addition, a comprehensive review of the planning and approval process for experimental and training activities has been completed. The result is a web-based system that will be implemented on 1 April 2012 and considers activities underway at DRDC Suffield. This system ensures that essential safety, regulatory, scientific integrity, ethical and resource requirements are identified and reviewed by line managers and safety experts before being approved. NDHQ recognizes the effort DRDC Suffield has put into its safety and environmental stewardship programs and commends them on this latest initiative.”

BCDRC Response (November 2012): Reviews are ongoing. Safety manuals have been updated. Safety and Health Management System is being implemented. Good progress is being made. We will continue to monitor.

DND/CAF Response (April 2013): “The internal ONTAP web-based review process has been fully implemented within the Centre and is working well. The Chemical Safety Committee continues to work through the recommendations from the review

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committee and has started implementation of those approved by the DG. The BCDRC will be updated during their next visit to Suffield.”

BCDRC Comment (December 2013): Notwithstanding the departure, due to restructuring, of some of the personnel involved in the original review, we trust that the impetus behind the review will be sustained and we look forward to receiving a report of further substantial progress during our 2014 visit. We will continue to monitor.

DND/CAF Response (February 2014): “The comprehensive chemical safety review resulted in 11 recommendations. A majority of these recommendations resulted in changes to DRDC Suffield’s safety manuals and standard operating procedures. There are a few recommendations still in the review and implementation process. BCDRC will receive a detailed status update of all 11 recommendations during their 2014 visit.”

BCDRC Comment (December 2014): We acknowledge the essential or imminent implementation of all but one of the Chemical Safety Review recommendations – that being the adoption of AChE testing in support of a Medical Surveillance Program. We look forward to an update on this issue during our next visit.

DND/CAF Response (July 2015): “The recommendations continue to be implemented, with the remaining effort focused on a certified agent worker standard and AChE testing. The lowest level of agent worker standards has been established and certification is underway. The next level is now under development. The AChE testing protocols have been designed and are being reviewed as part of an experimental process involving the use of human subjects. As well, the results of a chemical worker workplace risk assessment have been presented to Health Canada in order to establish occupational health assessment guidelines (OHAG) that will also be implemented.”

BCDRC Comment (December 2015): We commend this progress and look forward to a report of the completed implementation of the certified agent worker program, AChE testing protocols and hiring of a full-time Chemical Safety Officer.

DND/CAF Response (September 2016): “The recommendations continue to be implemented, with the remaining effort focused on worker certification, Acetylcholinesterase (AChE) testing, and the hiring of a chemical safety officer. Agent worker certification at the first level has been completed, and the second level assessment tools are being finalized, with testing to begin shortly. AChE testing was completed in July 2016, and the full program is expected to be implemented by the end of 2016. The process to hire a full time chemical safety officer has also been initiated.”

BCDRC Comment (December 2016): We now understand that while an AChE Monitoring Program based on a UK model has been endorsed and a pilot program approved and executed, full implementation of the program is now expected in 2017. We look forward to completion of the definition of the higher agent certification level criteria and to meeting the new CSO.

DND/CAF Comment (April 2017): DRDC is expecting a staffing classification decision to be made soon, which will permit the start of the hiring process for the chemical safety

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officer. The Acetylcholinesterase (AChE) monitoring report has been submitted for review, and draft standard operating procedures are being developed that take into account issues raised during the pilot project. The full program is planned for use in July during Exercise Precise Response 2017, a NATO CBRN live training exercise. The evaluation material for Level 2 Agent Worker Certification is undergoing final review.

Status: OPEN

- 3. (2014) *We encourage acceleration of the final approval and funding of the project to replace DRDC Suffield's BSL 3 suites in Building 1 with new modular BSL 3 laboratories to be located in a separate nearby building pending completion of a new laboratory complex.***

DND/CAF Response (July 2015): "During 2014, DRDC reviewed the original 2004 requirement and has invested significant effort to revise the Statement of Requirement (SOR), update the project identification documents (SS(ID)), and review the main options for presentation to a senior review board (SRB) in April 2015. This will be the first official stage in getting what amounts to a new \$14M project into the DND infrastructure investment plan."

BCDRC Comment (December 2015): We commend this effort and will closely monitor further progress of this vital undertaking. In the meantime, we urge that the maintenance of critical systems in Building 1 continue to receive diligent attention.

DND/CAF Response (September 2016): "DND/CAF has initiated a process for the replacement of the biological laboratories at the DRDC Suffield Research Centre for handling of risk group 2 and 3 biological agents. This project has been identified in internal development and acquisition plans and is undergoing options analysis and review. Taking into account administrative processes, the anticipated timeline to update existing facilities is 3-5 years. While this process continues, DRDC continues to exercise its extensive preventative maintenance program"

BCDRC Comment (December 2016): We acknowledge the additional complications introduced by the transfer of real property responsibilities to ADM IE, but continue to urge priority attention to this project. We will continue to monitor and report progress.

DND/CAF Comment (April 2017): During the transfer of responsibilities to ADM (IE), the review of outstanding infrastructure projects resulted in a significant improvement in the recapitalization of the Suffield Chemical and Biological Laboratories as it has become the highest rated ADM(S&T) project within the ADM(IE) major construction queue. While it still remains in the unfunded queue, it is expected that this improvement will result in concrete action in the near future. The interim replacement of the biological laboratories continues through the capital equipment program.

Status: OPEN

- 4. (2015) *The Canadian Forces Health Services Group should clarify its expectations of 1 Canadian Field Hospital with respect to the Hospital's capability to operate in a BCD***

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environment including the provision of treatment to biological and chemical warfare agent casualties.

DND/CAF Response (September 2016): “In the event of a chemical, biological and (sic) nuclear (CBRN) incident, there are four tasks that would be expected of 1 Canadian Field Hospital:

- provision of medical and surgical care to CBRN casualties;
- protection of medical personnel and their patients in the event of a local CBRN attack;
- protection and maintenance of critical capabilities (i.e., surgery) in the event of a local CBRN attack (through the use of collective protection); and
- small scale decontamination of patients in the vicinity of the medical facility.

1 Canadian Field Hospital possesses the specialized equipment needed to operate in a Biological and Chemical Defence (BCD) environment. Regarding the provision of treatment in a BCD environment, the Canadian Forces Health Services Group (CFHSG) currently sends clinicians to clinical biological and chemical warfare training courses in the United Kingdom and the United States. Non-clinical CBRN courses are also available in Canada to further support the unit’s ability to operate in a CBRN environment. As well, the CFHSG units, including 1 Canadian Field Hospital, are required annually to achieve individual CBRN training for the Individual Battle Task Standards for Land Operations, Individual Standard Level 2.

CFHSG will include specific collective training standards for 1 Canadian Field Hospital in the 2016/2017 Commander’s Annual Planning Guidance, which should be available in fall 2016. Furthermore, 1 Canadian Field Hospital will be requested to review the four tasks listed above in order to identify any additional resource requirements (e.g., personnel/equipment/training) needed to further support the unit in providing the expected capabilities.”

BCDRC Comment (December 2016): We look forward to learning of the results of these actions during our next visits to 1 Canadian Field Hospital and to CFHS Group HQ.

DND/CAF Comment (April 2017): The Canadian Forces Health Services Group (CF H Svs Gp) has provided guidance to 1 Canadian Field Hospital, which will be reiterated in the Commander’s Annual Planning Guidance, tentatively set to be released in April 2017. This includes the identification of the following tasks expected of a deployed medical facility:

1. Provision of medical and surgical care to CBRN casualties;
2. Protection of medical personnel and their patients in the event of a local CBRN attack;
3. Protection and maintenance of critical capabilities (i.e. surgery) in the event of a local CBRN attack (through the use of collective protection); and

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4. Small scale decontamination of patients in the vicinity of the medical facility.

Furthermore, CF H Svcs Gp was able to significantly increase access to the Clinical CBRN course in the United Kingdom, which will greatly enhance the unit's ability to perform the tasks identified above. Ten clinical personnel, nine of which are from 1 Canadian Field Hospital and the other from another CF H Svcs Gp unit, have been selected to receive this training between January and April 2017.

Status: OPEN

5. ***(2016) A comprehensive assessment of Suffield Research Centre's unique occupational health and emergency medical support needs should be conducted under the leadership of an appropriate high-level authority with the possible participation of relevant stakeholders (e.g., SRC, CFB Suffield, 3rd Canadian Division, CFHS Group, Health Canada, Alberta Health Services, etc.). This same authority should also take the lead in designing and implementing cooperative, long-term solutions to any gaps so identified.***

DND/CAF Response (April 2017): As the national authority responsible for the oversight and provision of direction related to the compliance, control and risk management of CBRN S&T activities, the Chief of Staff (Science and Technology) will undertake an assessment of Suffield Research Centre's occupational health and emergency support needs during Fiscal Year 17/18. The assessment will be designed to engage all relevant stakeholders in identifying any potential gaps and providing options to address them.

Status: OPEN

ACRONYMS AND ABBREVIATIONS

AChE – acétylcholinestérase

ADM (S&T) - Assistant Deputy Minister (Science and Technology)

ADM (IE) – Assistant Deputy Minister (Infrastructure and Environment)

BCD - Biological and Chemical Defence

BCDRC - Biological and Chemical Defence Review Committee

BSL - Bio-safety Level

BTWC - Biological and Toxin Weapons Convention

BWA - Biological warfare agent

BWTMCM - Biological Warfare Threat Medical Counter-measures

CA - Canadian Army

CAF - Canadian Armed Forces

CANSOF - Canadian Special Operations Forces

CBAP - Chemical Biological Assessment and Protection

CBR – chemical, biological and radiological

CBRN - chemical, biological, radiological and nuclear

CBRNE - chemical, biological, radiological, nuclear or explosive

CFB - Canadian Forces Base

CFFCA - Canadian Forces Firefighting and CBRN Academy

CFHS Group HQ - Canadian Forces Health Services Group Headquarters

CJIRU - Canadian Joint Incidence Response Unit

CM - counter-measures

CMED - Central Medical Equipment Depot

CMP - Chief of Military Personnel

CNSSSF - Canadian National Single Small-scale Facility

CTTC - Counter Terrorism Technology Centre

CSSP - Canadian Safety and Security Program

CWA - chemical warfare agent

CWC - Chemical Weapons Convention

DAOD - Defence Administrative Order and Directive

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DFATD - Department of Foreign Affairs, Trade and Development

DG - Director General

DHSO – Directorate of Health Services Operations

DND - Department of National Defence

DRAP - Deficit Reduction Action Plan

DRDC - Defence Research and Development Canada

DSAB - Defence Science Advisory Board

FG - Force Generation

FY - fiscal year

GAC – Global Affairs Canada

GMP - Good Manufacturing Practices

HMRA - Hazardous Materials Reference Application

HQ - headquarters

HVAC - heating, ventilation and air conditioning

LegAd - Legal Advisor

MCL - Mobile Chemical Laboratory

MCM - medical countermeasures

MND – Minister of National Defence

NATO – North Atlantic Treaty Organization

NDHQ - National Defence Headquarters

ONTAP - On-line Turbo Approval Process

OPCW - Organization for the Prohibition of Chemical Weapons

OpMed - Operational Medicine

PHAC - Public Health Agency of Canada

RCAF - Royal Canadian Air Force

RCMP - Royal Canadian Mounted Police

RMC - Royal Military College

RCN – Royal Canadian Navy

S&T - science and technology

SAP - Special Access Program

SLA - Service Level Agreement

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SOFCOM - Special Operations Forces Command

SOP - Standard Operating Procedure

SRC – Suffield Research Centre

TB - Treasury Board

CRV – Centre de recherche de Valcartier

WMD - weapons of mass destruction