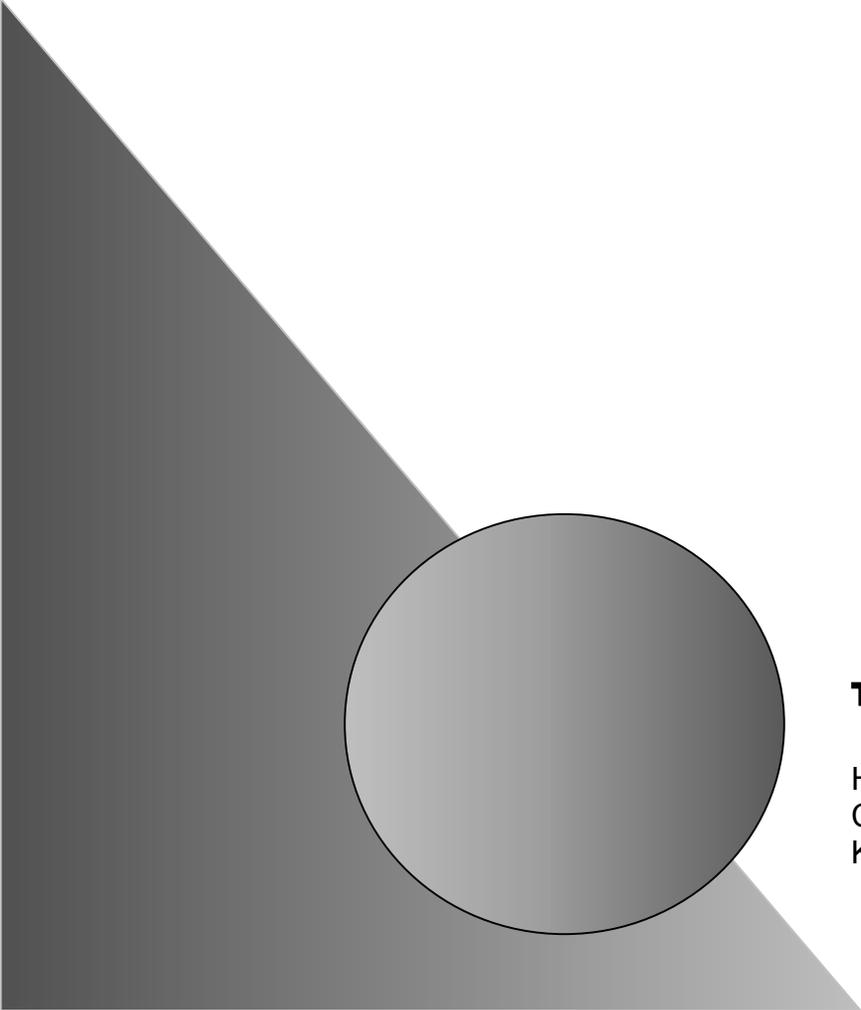


2001 Annual Report

Biological and Chemical Defence Review Committee



THE COMMITTEE

Heather D. Durham (Chair)
Colin R. McArthur
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| TABLE OF CONTENTS | i |
| INTRODUCTION | 1 |
| COMMITTEE ACTIVITIES -- 2001..... | 2 |
| IMPLEMENTATION OF BARTON REPORT RECOMMENDATIONS..... | 3 |
| IMPLEMENTATION OF BCDRC REPORT RECOMMENDATIONS | 6 |
| SOME IMPORTANT ISSUES..... | 10 |
| COMMENT | 11 |
| CONCLUSIONS..... | 13 |
| RECOMMENDATIONS | 14 |
| | |
| BIOGRAPHIES OF COMMITTEE MEMBERS | A-1 |
| REFERENCES FOR PREVIOUS REPORTS..... | B-1 |
| | |
| COMMITTEE RESPONSIBILITIES | C-1 |

SUMMARY

This report records the year 2001 activities of the Biological and Chemical Defence Review Committee (BCDRC). It also indicates the current state of the implementation of the recommendations made in the 1988 Barton Report and the reactions by the Department of National Defence (DND) to recommendations contained in previous BCDRC reports.

We have concluded that there are neither indications of duplicity within Canada's biological and chemical defence (BCD) program nor evidence that offense related activities are being conducted either on behalf of Canadian authorities or to comply with any multilateral treaty commitment.

It is our opinion that Canada should retain the capability to conduct a modest program of defensive research and development to permit military operations under the threat of biological and chemical weapons.

In this report the BCDRC makes five recommendations that are explained later in the text. The recommendations are:

That an annual visit to the Office of Critical Infrastructure Protection and Emergency Preparedness (OCIPEP) be included in the BCDRC visit program at National Defence Headquarters (NDHQ).

That freezers in the Level II containment facility at the Defence Research Establishment Suffield (DRES) be labeled with the name of the person(s) responsible for the freezer and have a logbook of the

contents attached. Should the logbook be removed, its location and the person responsible should be indicated on the freezer.

That Defence R&D Canada (DRDC) establish a mechanism to ensure that Human Research Ethics protocols from Defence Research Establishment (DRE) scientists are evaluated consistently, expeditiously and according to the latest TriCouncil Policy Statements on Ethical Conduct for Research Involving Humans.

That BCDRC or another national civilian committee serve to provide external professional advice to the Canadian Forces Medical Group (CFMG) on the use of biological and chemical medical countermeasures.

That the BCDRC be informed when containers or expended rounds that may contain live agent are discovered at any DND facility.

INTRODUCTION

The policy of the government of Canada is to press for global, comprehensive and verifiable treaties to ban all biological and chemical weapons. However, while the threat from such weapons endures, Canada has an obligation to ensure that members of the Canadian Forces (CF) have adequate training and equipment to protect themselves against exposure to chemical and biological agents. This protection is required for deployments on foreign soil and, as the threat of terrorist action exists in Canada, it is also required for military response to domestic emergencies.

On the other hand, the Canadian public has the right to be assured that Canada's policy of maintaining only a defensive capability in this field is fully respected at all times, and that any research, development and training activities undertaken pose no threat to public safety or the environment.

To facilitate this assurance, the BCDRC was established by the Minister of National Defence. The Committee is mandated to review annually the research, development and training activities in biological and chemical defence (BCD) undertaken by DND to ensure that they are defensive in nature and conducted in a professional manner with no threat to public safety or the environment (BCDRC Responsibilities are in Annex C).

The Committee members' appointments are approved by the Deputy Minister of National Defence and the Chief of the Defence Staff on the recommendation of the Committee Chairperson. Nominations for BCDRC membership are solicited by the Chairperson from the Royal Society of Canada, the Canadian Federation of Biological Societies, the Canadian Society of Microbiologists, the Chemical Institute of Canada, and the Society of Toxicology of Canada.

The present members are:

Chair Dr Heather D Durham
 McGill University
 [Toxicology]

Member Dr Colin R McArthur
 York University
 [Chemistry]

Member Dr Kenneth L Roy
 University of Alberta
 [Microbiology]

Commencing in 1990, Annual Reports have been submitted. All have been made available to the public and are reproduced on the BCDRC Internet web page (www.vcds.dnd.ca/bcdrc/index.html) (see Annex B).

COMMITTEE ACTIVITIES -- 2001

Between 29 April and 2 June 2001, the Committee visited the following DND Establishments including the associated ranges, laboratories and training facilities:

National Defence Headquarters (NDHQ)
with briefings from or meetings with:

Defence R&D Canada (DRDC)

Deputy Chief of the Defence Staff
and:

Directorate Nuclear, Biological
and Chemical Defence
(DNBCD)

Directorate of Scientific and
Technical Intelligence
J2 Imagery

Director General of Health Services:
Canadian Forces Medical
Group/Operational Medicine

Office of Critical Infrastructure
Protection and Emergency
Preparedness

Chief of Maritime Staff:
Maritime Forces Pacific Headquarters
including:
Sea Training Pacific
HMCS Ottawa

Chief of Land Staff:
Director Army Doctrine

Chief of Air Staff:
1 Wing Headquarters

Canadian Forces Recruiting, Education and Training System:

Canadian Forces Nuclear, Biological and Chemical (CFNBC) School with briefings about its responsibilities, resources and training
Royal Military College
Canadian Forces College

Defence Research Establishment Suffield (DRES) with briefings about the responsibilities, resources and activities of DRES and the BCD program.

While at DRES, the BCDRC held discussions with the General Safety Officer, the Biological Safety Officer and union representatives. Work of the Human Research Ethics and Animal Care Committees was reviewed. The Committee toured the facilities and met with research scientists from the Hazard Assessment and Agent Toxicity Group, the Detection and Identification Group, the Physical Protection Group, the Medical Therapy Group and the Preventive Medicine Group. Time was made available to allow any member or groups of members to approach the Committee to discuss matters of concern. These activities provided useful insights into the program and morale at Suffield.

Reports were presented to the Committee by representatives from the Department of Foreign Affairs and International Trade (DFAIT) about the status of the Chemical Weapons Convention and the

Biological and Toxins Weapons Convention; the Canadian Security and Intelligence Service about the domestic biological and chemical threat; and representatives of two universities (Calgary and Oklahoma State) that have biological or chemical R&D contracts with DRES.

We reviewed DND's 2001 BCD Research and Development (R&D) Program and determined that it was in accordance with current Canadian Government Policy. The latest version of the DRES Service Level Agreement, Defence and Civil Institute of Environmental Medicine (DCIEM) Fact Sheets, current R&D contracts and publications lists were examined. In addition, the DRDC accountability documents were scrutinized.

To enhance our perspective of the concerns of Canadians in Canada's biological and chemical defence (BCD) activities the Committee invites any group of concerned citizens to meet to discuss issues. The committee met with John Bryden, MP, in Ottawa to update him on the committee's activities. No other group came forward during the 2001 BCDRC visits although the Committee has been contacted for information by organizations and individuals during the year. Any group or individual that wishes to make representation to the committee should contact the executive officer in writing. Information may be found at <http://www.vcds.dnd.ca/bcdrc/index.html>.

IMPLEMENTATION OF BARTON REPORT RECOMMENDATIONS

The current implementation status of the Barton Report recommendations was ascertained to be:

GENERAL

1. **In the course of the annual program and budgetary process, the authorizing officer at each level be required to sign a certificate of compliance with Departmental policies.**

Certificates of Compliance for 2001 were reviewed and found to be in order.

2. **A senior Review Committee be established in association with the Defence Science Advisory Board (DSAB).**

We constitute such a Committee. In 1997 the Committee was removed from the aegis of the DSAB and established as a self-administering agency (see Annex C).

3. **"Second opinions" should be obtained from outside sources on some of the potentially controversial test programs.**

The BCDRC suggested that the most effective way to obtain credible second opinions would be to establish external committees and to encourage collaboration through workshop type conferences. Defence Research and Development Branch (which became Defence R&D Canada in 2000) held a Technology Investment Workshop on biotechnology in November 1996. Also an independent Peer Review of the DRES BCD R&D program was conducted in June 1997. In 2000, DRDC established a permanent Advisory Board. It is co-chaired by the Vice Chief and Deputy Chief of

Defence Staff and has as members the Chiefs of Air, Maritime and Land Staffs, and other individuals at the associate deputy minister level. The Director General Health Services is also a military member. Industry is represented by the President of Com Dev International, the Executive Vice-President of MDS Incorporated, the Senior Vice-President of Computing Devices Canada and the Executive Vice-President of Entrust Technologies. The past president of the Medical Research Council of Canada is also a member.

4. **A document be prepared annually which would set out the nature of the research and development work under way, the number of people involved, and allocated funding.**

The 1990/91 Chief Research and Development (CRAD) Review was published in February 1992 and the 1991/92 Review in January 1994. The Defence Research and Development, Science and Technology for the New Century was published in March 1996.

The initial Defence Research and Development Branch Outline of Program was published in April 1996, the second edition in June 1997 and the third edition in June 1998. The branch produced its first annual report, covering the fiscal year 1998/99.

DRDC has continued this practice with a second annual report. These reports satisfy this recommendation. The 1999-2000 Annual Report is on the DRDC web site:

<http://www.drdc.dnd.ca>.

5. **A layman's pamphlet be published which would help improve public**

understanding about Biological and Chemical Defence.

An appropriate departmental pamphlet was published in August 1990. A similar pamphlet entitled "Meeting the Challenge - Research and Development in Defence Sciences and Technologies", emphasizing the work at DRES, was published in April 1993. DRDB published "Defence R&D Highlights" six times yearly and the web site (<http://www.drdb.dnd.ca>) has been established and continues to grow. In addition, DCIEM and DRES publish Fact Sheets recapitulating the essential components of their R&D programs.

6. **A DND directive on policies and procedures regarding the use of volunteers and animals be published.**

DND Policy - Animal Use in R&D was issued on 15 June 1989. Defence Administrative Orders and Directives (DAOD) 5061-0 and 5061-1, Research Involving Human Subjects, were issued on 20 August 1998. These administrative orders may be viewed on the DAOD web site at: http://www.dnd.ca/admfincs/subjects/daod/intro_e.asp.

DRES

1. **A procedure be established to ensure that the DRES Safety Manual is reviewed at prescribed regular intervals of not more than three years. Safety drills should also be conducted at prescribed regular intervals.**

An effective, dynamic safety program has been established. Drills and exercises are conducted and any safety related issues are resolved quickly.

2. **An automatic annual review and certification procedure be instituted to confirm that stocks of toxic agents are being kept to the minimum level necessary for the conduct of an efficient research and development program.**

The annual inventory audit was reviewed by the BCDRC in May 2001. Chemical and biological agent holdings were verified then. The committee agrees that stocks are being properly maintained at a minimum level, which in most cases is only a fraction of the authorized levels.

3. **The arrangements being implemented to improve security and access controls be expedited.**

Completed.

4. **Pending the destruction of the excess agent stocks now stored in the Experimental Proving Ground (EPG), the adequacy of existing physical security arrangements be reviewed with a view to strengthening them.**

Completed.

5. **The incinerator which is to be acquired for the program be considered for use in the destruction of other dangerous industrial chemicals, including PCBs.**

The Alberta Provincial Government

legislated this recommendation unimplementable. The incinerator was sold and its removal from DRES was completed by 6 August 1992.

6. **The Experimental Proving Ground (EPG) operation and maintenance be given "project" status within the CRAD program.**

Implemented. Thus positive visibility is given to all activities, funding and personnel involved in the EPG and ensures an annual review as a separate program component.

7. **The scope of the safety and environmental requirements governing outdoor testing at DRES be determined by the provisions of the Canadian Environmental Protection Act.**

Although the present Act does not include such express provisions, the Federal Minister of Environment has said that the department will develop the requisite guidelines as and when necessary. In addition, a staff control system is in place and functioning to ensure compliance with all constraints.

8. **A full environmental audit of DRES be commissioned as soon as possible and that it be repeated at regular intervals of, say, five years.**

Acres Consultants Ltd, having completed the audit under a Supply and Services Canada contract, submitted their final report in February 1992. An internal staff agency was created to initiate recommendation compliance. All the Report's recommendations have been addressed

and full compliance is anticipated. The Acres' report has been deposited with the Canada Institute for Scientific and Technical Information (CISTI), the National Library and major university libraries throughout the country. The first follow-on audit was conducted by Acres International Ltd in early 1997 and the report was received at DRES on 31 March 1997. The Committee expects to review the second follow-on audit report during its 2002 visit to DRES.

DREO

As the entire Defence Research Establishment Ottawa (DREO) chemical agent inventory has been destroyed, all storage and handling facilities removed, laboratories dismantled and the facility decommissioned, the BCDRC will no longer report on DREO activities.

IMPLEMENTATION OF BCDRC REPORT RECOMMENDATIONS

Note: Once a recommendation has been complied with to the satisfaction of the Committee it will cease to be included in subsequent Reports. However, if the effect of the recommendation is of a continuing nature it will be subject to periodic monitoring by the Committee.

1. **The flow of information within the Defence Research laboratories between sections, management and staff might be improved -- possibly through occasional informal meetings and discussions with senior managers.**

Although there is some improvement in awareness levels, additional effort is required. An effective plan of communication is particularly important because of the significant restructuring and budget reductions in DND over the last few years. Monitoring at DRES and DRDC, as well as DNBCD and military units, will continue.

2. **The Annual Agent Inventories Audit Reports be restructured as follows:**
 - a. **biological agents used for research purposes are to be identified by complete strain or antigenic designator;**
 - b. **stocks of biological agents are to be quantified in meaningful terms; i.e., infectious titres or colony-forming units per given volume;**
 - c. **stocks of biological agents that are clearly not agents of biological warfare should be identified as such with an accompanying statement to the effect that such agents may be found in Public Health, University and Industrial laboratories.**

Approved. This work will be completed in accordance with a schedule agreed to by BCDRC and DRES. There is satisfying progress and monitoring will continue.

3. **The biological agent holdings of DRES be restricted to those**

microorganisms that are in frequent use or not readily available from central strain repositories.

Approved. Compliance will be effected in accordance with a schedule agreed to by BCDRC and DRES. Progress is being made towards this goal. Monitoring will continue.

4. **The BCDRC be contractually guaranteed access to all private sector laboratories that become involved in the Biological and/or Chemical Defence Research and Development program either under the prevailing contracting system or through the auspices of the industrial partnership proposal.**

This recommendation was approved in 1994. To date, DRDC has not resolved this issue with Public Works and Government Services Canada (PWGSC), the contracting agency. Although contractors routinely provide formal briefings to BCDRC during our annual visits to DRES and DCIEM and circumstances have yet to arise when BCDRC has considered an on-site visit necessary, the committee does not have guaranteed access to such private sector laboratories. Discussions between DRDC and BCDRC continue in order to resolve this issue in a manner which respects the committee's mandate to verify the defensive nature of all work carried out under DND's auspices and the proprietary nature of private sector research. The position of the BCDRC is that a standard clause should be included when other public sector or private sector laboratories are contracted to carry out BCD-related

work for DND. The clause should stipulate that, as part of DND's R&D program in BCD, the work is subject to review by the BCDRC, that BCDRC reserves the right to conduct this review onsite in the laboratories where the research is being conducted, and that members of the BCDRC would be subject to confidentiality agreements to protect proprietary rights of the contractor. Similarly, when DND is contracted by other parties to carry out work related to BCD, the contract should stipulate that all work related to BCD carried out in DND facilities is subject to review by the BCDRC and that members of the BCDRC would be subject to confidentiality agreements to protect proprietary rights of the contractor.

5. **For research purposes, vaccine strains of bioagents in lieu of pathogenic strains should be used whenever possible.**

Approved. This work will be completed in accordance with a schedule agreed to by BCDRC and DRES. Although monitoring will continue, this recommendation will be dropped from next year's report.

6. **The CFNBC School Training Library collection be reviewed and dated reference material be replaced. Additionally, the ability to access information servers, e.g.; Internet or World Wide Web, be provided.**

Agreed. Marked progress has been made in this endeavour. The library has Internet access and is using it to

obtain increased amounts of scientific material. Monitoring will continue.

7. **The skills of the present DRES Staff be reviewed to ensure that no critical imbalances have been created that might affect productivity, safety or responsiveness.**

The current DRES staff is under continual review. Budgetary restrictions have not resulted in compromise of safety, which continues to be of the highest standard. However, for Defence Research Establishments to maintain productivity and their current world class reputation, continuing education of staff through attending courses and scientific meetings is mandatory. In his response to the 2000 BCDRC report, the Assistant Deputy Minister for Science and Technology has said that DRDC will make every effort to maintain current momentum in staffing and has noted that a molecular geneticist with experience in endemic diseases has joined the DRES staff. However, staffing remains a concern at DRES and it concerns the BCDRC. To ensure continued performance over the long term, more recruitment will be required to provide continuity upon retirement of several senior scientists and to provide expertise in new fields of biotechnology. The Committee will continue to monitor the staffing issue.

8. **The DRES Safety Manual and Emergency Response Plans be updated and tested at least annually.** Agreed. Monitoring will continue. The DRES general safety officer

conducts a dynamic program. He has added computer-based training and uses the DRES local area network to circulate safety information.

9. **DRES replace the current computer-based agent inventory control system with a simplified program.**

Agreed and implemented. The BCDRC will continue to observe the system in 2002 and have this recommendation removed from the report the following year, if the program is deemed to be completely suitable.

10. **Consideration be given to authorizing at least two personnel annually from the "National Medical Decontamination Platoon" (about to be established) to participate in live, chemical agent training at DRES.**

Agreed, however the "National Medical Decontamination Platoon" was not established. If the current status prevails, this recommendation will be dropped from next year's report.

11. **The BCDRC mandate be amended to include an annual visit to Health Canada's Laboratory Centre for Disease Control (LCDC) in Winnipeg whenever research is being conducted there either by or directly for DRES.**

The Winnipeg laboratory is now called "The Canadian Science Centre for Human and Animal Health" which is part of the Population and

Public Health Branch of Health Canada. Health Canada and DND have signed a memorandum of understanding for collaborative work but there are no joint projects underway.

12. **DRES renegotiate the annual containment facility decontamination contract to permit the verification of its biological agent holdings by the BCDRC during the annual May visit.**

DRES agreed. Dates of the BCDRC visit and the level III decontamination are now set one year in advance through consultation between BCDRC and the BioSafety Officer at DRES. This procedure worked very well for 2001 and dates for 2002 were set during our 2001 visit.

13. **To facilitate the Health Canada approval process for new medical countermeasures against chemical and biological agents, it is recommended that eventual regulatory requirements be considered at early stages of R& D and all data be collected and records maintained according to Good Laboratory Practice (GLP) guidelines.**

Approved. The recommendation is being implemented on a case by case basis.

SOME IMPORTANT ISSUES

Concerned Citizens Groups

In the past, during the course of meetings with representatives of special interest groups and of the media, a few primary concerns have been identified and reasoned responses were given by the Committee at those times. However, two specific concerns do merit recorded comment.

Based on our research and discussions with DND personnel, we offer the following:

1. Concern: How do interested persons differentiate with unequivocal confidence between offensive and defensive research.

Comment: In general, the Committee believes that it is neither possible nor profitable to try to rigorously define the scope of these activities. However, offensive and defensive biological and chemical research can be at least partially defined in terms of the quantities involved, the activities in progress and the general intent.

Quantities are more easily defined with chemical agents since defensive activities, such as equipment testing and decontamination drills involve only small amounts of agent, well within the limits proscribed by the provisions of the Chemical Weapons Convention (CWC). Equally, precursor chemicals should correspond on a chemical equivalence (or molar) basis with the actual agent.

These quantities should be traceable from source to end agent provided that trading and shipping procedures are kept under scrutiny. Biological agents

are more difficult to quantify, per se, since large amounts can be grown from a small viable colony. However, even then materials such as growth media, and sometimes specific pieces of equipment, are necessary and should be traceable and accountable.

Activities can be subdivided into development of new or modified agents, testing procedures, and training protocols. In either chemical or biological research, it would be reasonable to consider deliberate attempts to enhance persistence, virulence or toxicity, or to circumvent existing defence procedures, as offensive in nature. In testing, one could differentiate between testing the agent for the properties suggested above, and testing the defensive equipment against known or suspected agents. The former should raise suspicions of offensive activity unless justified in relation to defensive capability. The latter should be part of any responsible defensive activity. Similarly, training to deliver chemical or biological agents is clearly offensive while training to protect against or neutralize such agents is a necessary part of a defensive posture.

Intent is the least fathomable aspect. It relies heavily on inter-personal contact and interaction, and progress in confidence building measures. This point has also been outlined in the paper by Dr. David L Huxsoll of Louisiana State University, printed in Volume 666 of the Annals of the New York Academy of Sciences [The Microbiologist and Biological Defense Research: Ethics, Politics and International Security] dated

31 December 1992 to which the Committee referred in the 1994 report.

2. Concern: Obtaining information from DND is a daunting and time-consuming activity.

Comment: As specific incidents could not be identified, it is difficult to offer an adequate response. However, if requests for information or for assistance in request formulation are addressed to either the Director General Public Affairs or to the Access to Information Coordinator in National Defence Headquarters, we are confident that positive results in accordance with current regulations will be forthcoming.

Defence R&D Canada

During fiscal year 1999-2000, the Defence Research and Development Branch (DRDB), organized under the Chief of Research and Development (CRAD), reporting to the Assistant Deputy Minister (ADM) Materiel, has disappeared. It has been replaced by Defence R&D Canada (DRDC) under the ADM Science and Technology, Dr John Leggat. DRDC is an agency within DND, which is to provide leadership to DND, the Canadian Forces and the Canadian defence industrial base. An important change from the old branch is that the agency will retain revenues generated by conducting projects for clients outside DND.

BCDRC concludes that DRES will be conducting more biological and chemical research with non-governmental organizations in the future. With reductions in government spending, DRES, as part of DRDC, is relying more and more on external funding for its

programs in Defence research and development and on contractual arrangements with academic and industrial partners to conduct specific projects. This has positive aspects including maximizing R & D dollars, promoting Canadian industry and increasing interaction between DRES scientists and academic colleagues. However, BCDRC considers this work part of DND's research program in BCD and it will be the Committee's responsibility to verify that this research is all defensive in nature. To make this verification possible, the BCDRC must have the authority to visit the locations where this research is being conducted.

COMMENT

We would like to express our appreciation for the explicitness and cooperation given to us throughout our 2001 visits' schedule. At DRES we met with many researchers in their working laboratories. This more informal agenda provides a better method to exchange information with the scientists compared to formal briefings in sterile conference rooms and permits us to speak with a good cross section of people during each visit.

During our visit to Maritime Command Pacific, the Navy demonstrated that the ship's company on city class frigates is capable and confident of conducting operations in a chemical environment. There is less confidence among the sailors that they can operate equally well when a biological threat exists. We believe that, with the equipment and medical countermeasures that are available to the Navy, the capability is there and what is required is a better understanding of the biological threat to maritime operations and the countermeasures that are available to combat the threat.

The Committee was impressed with the capability to teach BCD at the new training facility at the Damage Control Division in Maritime Command Pacific and expects that the building will enable the Navy to increase its ability to work in a BC threat environment.

Encouraging progress in the BCD program was seen at several agencies during the 2001 visits. At some places, it was demonstrated that problems that had been restricting training events conducted with people wearing biological and chemical equipment are being eliminated. At other institutes, innovative research projects are providing useful data for the development of better equipment to combat the biological and chemical threat.

Within DND's R&D program, the quality of the science, the projects underway, the resultant publications and the level of safety awareness continue to be of high standard. A few issues arose that form the basis of recommendations listed below.

During the 2001 visit to DRES the BCDRC found two freezers in the Level II containment facility to have neither logbooks nor notices indicating who was responsible for the contents of the freezers. The Committee is of the opinion that contents of all freezers in the containment areas should be documented as part of good laboratory practice.

The federal guidelines governing use of human subjects or tissues in research have become more stringent in recent years. Following articles in the lay press on use of human foreskin keratinocytes in research at DRES, it was determined that the mechanisms for informed consent for use of human tissue/subjects at DRES did not conform to

current TriCouncil guidelines. Although the BCDRC has reviewed this research and has considered it a reasonable application, it is important that any research involving human subjects or tissues be reviewed in a manner compliant with national guidelines.

During our visit, the spokesperson for the Canadian Forces Medical Group (CFMG) indicated that they would welcome a national civilian professional oversight/audit on medical countermeasures used for biological and chemical defence. A number of medical countermeasures against chemical and biological weapons have investigational new drug or orphan drug status and may be used under special license agreements in military personnel. Although DND is attempting to move ahead with full licensure of these products with Health Canada as noted in the BCDRC 2000 annual report, several issues have arisen surrounding the use of these agents. Review by an independent advisory board would benefit CFMG and military personnel.

It is considered that Canadian participation internationally in matters related to BCD, such as participation in collaborative projects through Memoranda of Understanding, participation in governance and negotiations of chemical and biological weapons conventions, and previous participation in the United Nations Special Commission on Iraq (UNSCOM), is of notable importance both to Canada and professionally within DRDC and should be continued.

Although statements describing all existing contracts with outside agencies are open to our review, the continuation of an annual briefing by selected contractors and the ability of the BCDRC to review the research on site, in the laboratories at which the work

is being conducted, are deemed to be necessary in order to provide us with complete confidence in the total program. This is particularly important given the increasing emphasis on contractual arrangements to carry out research and the conversion of the Defence Research and Development Branch to Agency status.

As the CF deploy more frequently and with little warning to the lesser developed areas of the world, due recognition and effort should be given by the research and medical elements of DND to endemic natural biological hazards as well as those biological entities defined as agents. Also of concern to the responsible DND elements should be the threat of accidental or intentional dispersal of toxic industrial material, especially hazardous products of the chemical industry, in UN/NATO theatres of operations and in Canada as the domestic terrorist threat increases. It is because of the threat of the use of biological or chemical agents by terrorists in Canada that we were pleased to have the opportunity to meet with the Associate Deputy Minister (ADM) of Critical Infrastructure Protection and Emergency Preparedness (OCIPEP). The Committee is satisfied that the ADM will consider the domestic threat of the use of these weapons within her mandate.

Response to terrorist threat involving chemical or biological agent involves a coordinated response by several different agencies and government departments, including DND. The expertise of Defence Scientists, the Nuclear Biological and Chemical Response Team (NBCRT), and general support available to the Solicitor General all contribute to the ability of Canada to respond in case of these events. In this regard, the preparedness of Canada to respond depends upon the kind of expertise developed

within DND's BCD program and is an additional reason for preserving its strength. The establishment of ADM OCIPEP is a step towards better coordination of DND's capability in this area.

Middle East, African and Asian events, the current state of political affairs in Eastern Europe and Canada's involvement in peace restoration and peacekeeping operations in the lesser developed areas of the world where a threat of biological and chemical warfare often exists, all suggest that a discreet R&D program aimed at maintaining state-of-the-art detection and protection devices and effective medical countermeasures should continue. In addition, initial and annual refresher training designed to comply with National Defence Headquarters (NDHQ) Policy Directive P6/93 of 03 August 1993 should be carried out by all uniformed members of DND. The BCDRC is pleased to see the development of new policy directives DAOD 8006-0, Nuclear, Biological and Chemical (NBC) Defence Policy and DAOD 8006-1, Instructions for Nuclear, Biological and Chemical (NBC) Defence. The Committee sincerely hopes that these directives will focus more attention on BCD within DND and raise the level of competence in BCD throughout the CF.

CONCLUSIONS

The BCDRC found neither indications of duplicity within Canada's biological and chemical program nor evidence that offense related activities were being conducted either on behalf of Canadian authorities or to comply with any multilateral treaty commitment.

We remain convinced that Canada must retain a modest capability to effect

essential defensive research and development to permit the conduct of conventional military and counter-terrorist operations under the threat of biological and chemical weapons. We believe that Canada's ability to respond rapidly and effectively to biological and chemical threats, domestically or offshore, will depend upon the maintenance of core expertise in defence science within DND. It is our opinion that the priority of effort should be accorded to the following projects, which in addition to their obvious military relevance also contribute to treaty monitoring, medical support, pollution control and the handling of toxic wastes:

- a. agent detection and identification;
- b. prophylaxis and therapy for threat agents;
- c. development of less physiologically burdening individual protective clothing with wider geographical and employment specific pertinence;
- d. refinement of procedures to foresee and assess hazards posed by both established and hypothetical chemical and biological agents; and
- e. improved decontaminants.

RECOMMENDATIONS

The BCDRC determined that BCD is an element of the mandate of OCIPEP. Therefore, it is recommended that annual visits to OCIPEP be included in the BCDRC's sessions at NDHQ.

It is recommended that all freezers in the Level II containment facility at the Defence Research Establishment Suffield (DRES) be labeled with the name of the person(s) responsible for the freezer and have a logbook of the contents attached. Should the logbook be removed, its location and the person responsible should be indicated on the freezer.

It is recommended that DRDC establish a mechanism to ensure that Human Research Ethics protocols from Defence Research Establishment (DRE) scientists are evaluated consistently, expeditiously and according to the latest TriCouncil Policy Statements on Ethical Conduct for Research Involving Humans.

It is recommended that an arms-length committee of civilian professionals be formed to serve an advisory role to CFMG on biological and chemical medical countermeasures or that the mandate of the BCDRC be changed to include this responsibility.

The BCDRC has become aware, after the fact, that containers or artillery shells suspected of containing chemical agents have been found at DRE Ottawa and on the ranges at DRE Suffield. It is recommended that the BCDRC be informed when containers or expended rounds that may contain live agent are discovered at any facility.

BIOGRAPHIES OF COMMITTEE MEMBERS

Dr. Heather D. Durham (Chair)

A graduate in Pharmacology from the University of Western Ontario and the University of Alberta, she is a professor in the Department of Neurology and Neurosurgery and a Killam Scholar at the Montreal Neurological Institute, McGill University. Among her many appointments and affiliations, she is President of the Society of Toxicology of Canada, a member of the Board of Directors of the Canadian Federation of Biological Societies, and a member of the Scientific Advisory Board of the Muscular Dystrophy Association.

Dr. Colin R. McArthur

A graduate in Chemistry from the University of Western Ontario and from the University of Illinois, he has experience in the industrial and academic sectors. He is Professor Emeritus and past Chair, Department of Chemistry at York University, and Senior Scholar there. He is a member of the Canadian Society for Chemistry, of the International Union of Pure and Applied Chemistry, and a Fellow of the Chemical Institute of Canada.

Dr. Kenneth L. Roy

A graduate in biochemistry from the University of British Columbia, with postdoctoral studies at Yale University; he was a member of the Department of Microbiology at the University of Alberta for more than twenty years, and is now a Professor of Microbiology and Molecular Genetics in the Department of Biological Sciences at that institution. He has held a number of committee appointments at the University of Alberta, including Biosafety and Radiation Control, and is a member of the Canadian Society of Microbiologists and the Society for Industrial Microbiology.

REFERENCES FOR PREVIOUS REPORTS

Research Development and Training in Chemical and Biological Defence within the Department of National Defence and the Canadian Forces: A Review by William H. Barton, Minister of Supply and Services Canada, 1989, p.54. [Available in Canada through the Canadian Government Publishing Centre, Supply and Services Canada, Ottawa, Ontario K1A 0S9 (Catalogue No. D2-79/1989E, ISBN 0-660-13103-X) and Web Site <http://www.vcds.dnd.ca/bcdrc/index.html>.]

PREVIOUS BCDRC REPORTS

All previous BCDRC reports are available through the Committee web site, <http://www.vcds.dnd.ca/bcdrc/index.html> and National Defence Headquarters Library Services, National Defence Headquarters, MGen GR Pearkes Building, Ottawa, Ontario K1A 0K2.

First Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, 1991, p.7. It is also included in the second annual Review of the Chemical and Biological Defence Program January 1990 - April 1991, Minister of National Defence, Ottawa, February 1992, pp.28.

Second Annual Report of the Biological and Chemical Defence Review Committee, is included in the third annual Review of the Chemical and Biological Defence Program May 1991 - March 1992, Minister of National Defence, Ottawa, January 1994, pp.26.

Third Annual Report of the Biological and Chemical Defence Review Committee, is included in the fourth annual Review of the Chemical and Biological Defence Program April 1992 - March 1993, Minister of National Defence, Ottawa, September 1996, pp.26.

1993 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, June 1995, pp.9.

1994 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, June 1995, pp.9.

1995 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, February 1996, pp.9.

1996 Annual Report of the Biological and Chemical Defence Review Committee, Minister of National Defence, Ottawa, April 1997, pp.9.

1997 Annual Report of the Biological and Chemical Defence Review Committee,

Minister of National Defence, Ottawa, March 1998, pp.9.

1998 Annual Report of the Biological and Chemical Defence Review Committee,
Minister of National Defence, Ottawa, December 1998, pp.9.

1999 Annual Report of the Biological and Chemical Defence Review Committee,
Minister of National Defence, Ottawa, February 2000, pp.9.

2000 Annual Report of the Biological and Chemical Defence Review Committee,
Minister of National Defence, Ottawa, March 2001, pp. 13.

**BIOLOGICAL AND CHEMICAL DEFENCE
REVIEW COMMITTEE**

RESPONSIBILITIES

GENERAL

1. The Biological and Chemical Defence Review Committee (BCDRC) is to review annually the research, development and training programs in biological and chemical defence undertaken by the Department of National Defence (DND) to ensure that all activities within those programs are, in fact, defensive in nature and are conducted in a professional manner with no threat to public safety or the environment.

EXECUTION

2. The BCDRC will annually:

a. visit:

- (1) The Defence Research Establishment Suffield (DRES);
- (2) The Defence and Civil Institute of Environmental Medicine (DCIEM);
- (3) The Canadian Forces Nuclear, Biological and Chemical (CFNBC) School;
and
- (4) at least two other DND Establishments where biological and chemical training is conducted;

b. review the annual DND Research and Development Program as originated by the Assistant Deputy Minister Science and Technology (ADM(S&T)) and approved by the Defence Management Committee;

c. review the implementation of the recommendations made in the:

- (1) BARTON REPORT of 31 December 1988;
- (2) periodic Independent Environmental Audits of DRES; and
- (3) previous BCDRC Reports;

- d. examine the DRES and DCIEM Annual Reports, activities and records of the Human Research Ethics and Animal Care Committees and the current research and development contracts and publications lists; and
- e. submit a report of their activities and findings to the Chief of the Defence Staff (CDS) and the Deputy Minister (DM) of National Defence.

COORDINATION

3. The Committee, consisting of a chairperson and two members representing the disciplines of chemistry, microbiology and toxicology, is to be appointed for terms of three years by the DM/CDS on the recommendation of the pertinent learned society and the Committee Chairperson.

4. The BCDRC will be self-administering. It shall select an executive officer to attend to all procedural, reporting, coordination and administrative matters as directed by the BCDRC. The Executive Officer will establish liaison with and effect all tasking in support of BCDRC activities through the designated National Defence Headquarters (NDHQ) contact officers from the Directorate of Nuclear, Biological and Chemical Defence (DNBCD) and Defence R&D Canada (DRDC). The Executive Officer will coordinate financial and security issues with Director NDHQ Secretariat. BCDRC members and the Executive Officer must be in possession of a valid Level II (Secret) Security Clearance.

5. Upon receipt of the annual BCDRC report, the DM/CDS will respond to the BCDRC Chairperson in a reasonable time. All elements of DND are to provide assistance to the BCDRC as necessary and the required access to all relevant facilities, personnel and information required to meet the mandate of the BCDRC.