

**MEETING OF THE STATES PARTIES TO THE  
CONVENTION ON THE PROHIBITION OF  
THE DEVELOPMENT, PRODUCTION AND  
STOCKPILING OF BACTERIOLOGICAL  
(BIOLOGICAL) AND TOXIN WEAPONS AND  
ON THEIR DESTRUCTION**

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Item 5 and 6 of the agenda

**Laboratory Clusters  
Integrated Networks for Enhanced Response and Consequence Management<sup>1</sup>**

**Submitted by Canada**

**Background**

1. September 2001 and the subsequent anthrax letter attacks brought national security and in particular the requirement for Chemical, Biological, Radiological and Nuclear (CBRN) counter-terrorism preparedness into new focus. The CBRN Research & Technology Initiative (CRTI) represents the Canadian commitment to providing science and technology (S&T) solutions for national security and CBRN preparedness.<sup>2</sup> CRTI is a joint, interdepartmental initiative between Public Safety and Emergency Preparedness Canada, Health Canada, Atomic Energy of Canada, Canadian Nuclear Safety Commission, Environment Canada, Agriculture and Agri-Food Canada, Canada Food Inspection Agency, Department of Fisheries & Oceans, National Research Council, Natural Resources Canada, Royal Canadian Mounted Police, Canadian Security Intelligence Service, Treasury Board Secretariat, Privy Council Office, and Defence R&D Canada.

2. The CRTI is mandated to strengthen Canada's preparedness for, prevention of, and response to a CBRN attack by fostering new investments in research and technology. An innovative aspect of the Canadian program is to create clusters of federal laboratories to build S&T capacity to address the highest risk terrorist attack scenarios. Underlying the requirement to develop a laboratory cluster system in Canada are the problems associated with a geographically dispersed population, transportation of samples, and the need for urgent access to federal expertise to support a local

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<sup>1</sup> Prepared by Defence Research and Development Canada, Dr. Camille A. Boulet, Director, CBRN Research and Technology Initiative Defence R&D Canada.

<sup>2</sup> For more information see [www.crti.drdc-rddc.gc.ca](http://www.crti.drdc-rddc.gc.ca)

response.

### **Laboratory Cluster Model**

3. Under the framework approved by the Treasury Board of Canada, Canadian federal science based departments and agencies have been directed to develop a network of laboratories in three disciplines, chemical, biological, and radiological/nuclear, to support the Government of Canada's response to terrorism. These networks are known as clusters and are comprised of federal laboratories from departments and agencies that have mandated roles and responsibilities in a terrorism event such as Health Canada, the Canadian Food Inspection Agency, the Royal Canadian Mounted Police, and Environment Canada. Other government departments or agencies also participate based on the particular knowledge, expertise, or laboratory capacity role they have with respect to terrorism response and the particular CBRN hazard.

4. Each Laboratory Cluster is formally tasked to:
- (a) Ensure its preparedness through the development and maintenance of a cluster operations plan;
  - (b) Develop the roles and procedures by which the laboratory cluster supports department operational mandates during a bioterrorism event;
  - (c) Develop appropriate working relationships between cluster members with particular emphasis on engaging first responders; and
  - (d) Manage cross-cluster interactions.

5. The Biological Cluster is co-chaired by Health Canada and the Canadian Food Inspection Agency (CFIA) and manages specific activities related to bioterrorism including:

- (a) Threat assessment;
- (b) Surveillance, alert, and warning;
- (c) Crisis management and immediate reaction;
- (d) Consequence management;
- (e) Attribution and criminal investigation;
- (f) Operational preparedness; and
- (g) Surge capacity and sustainability.

6. Through the CRTI, each cluster is provided funding and support to acquire technology and capacity to improve response to a terrorism event. These clusters can also plan exercises, studies or enter into formal collaborations to address a specific S&T project.

7. Broad departmental participation in the laboratory clusters ensures that federal laboratory resources are available in most provinces and regions in Canada. This facilitates access to specialized facilities and expertise and can minimize transportation of sample requirements.

### **Biological Cluster in Action**

8. The Biological Cluster has already been validated as a result of recent public health and animal disease outbreaks in Canada. In 2003, Cluster members supported Health Canada in the

investigation of the aerosol hazard from SARS in hospital environments and coordinated access to specialized equipment and surge capacity at CFIA's National Center for Foreign Animal Disease.

9. In 2004, following the outbreak of Avian Influenza in British Columbia, CRTI Cluster members were called on to assist CFIA operations. The Meteorological Service of Canada (MSC), the Canadian Meteorological Centre, Defence Research and Development Canada – Suffield and Agriculture and Agri-Food Canada participated in the response.

10. The MSC deployed an emergency surface weather station and an emergency upper air station to provide special weather forecasts as well as fine scale and atmospheric dispersion modeling. This equipment is housed at MSC regional centers across Canada to facilitate rapid deployment. The meteorological modeling supported the CFIA investigation of the source and origin of the Avian Influenza outbreak and Defence Research and Development – Suffield deployed aerosol-sampling equipment to track the virus. Agriculture and Agri-Food Canada assisted by providing geographic information system support and information, allowing CFIA to focus their efforts better on direct consequence management. The Canadian Meteorological Centre and the CFIA are also collaborating on the development of simulation programs on the spread of animal and zoonotic disease.

### **Surge Capacity and Capability**

11. The intensity of response behind biological events, where 24/7 operations may be required over several weeks or months, can exhaust the personnel capacity of any single laboratory or department. These operations pose tremendous stress on individual workers, emphasizing the requirement to provide periodic relief. Large numbers of diagnostic or environmental samples lead to a direct requirement for surge capacity to process samples over short periods of time to provide quantitative data for medical treatment and consequence management decisions. Establishing proactive arrangements to sustain crisis phase operations will improve capability and surge capacity.

12. In particular, the Biological Cluster has identified the need to develop agreements for training of personnel in bio-level containment operations, standardization of analytical platforms, and assay methodology for diagnostics and environmental samples as important enablers to facilitate personnel exchange during operations.

### **International Collaboration for Consequence Management**

13. The Biological Cluster can serve as a model for international cooperation to support crisis and consequence management of a biological terrorism event. A focused network of laboratories can provide immediate access to specialized facilities, personnel, and knowledge for a range of crisis and consequence management activities that may not be resident within a single department or country. Most importantly, the cluster provides a structured forum to develop interpersonal, inter-laboratory, and interdepartmental relationships that help minimize obstacles to a timely response.

## **Conclusions**

14. The Canadian CRTI Biological cluster serves as a model for the development of a multidisciplinary response network to support both national and international response to bioterrorism. It allows for access to equivalent facilities and trained personnel to provide surge capacity for diagnostic and environmental sampling.

15. A multidisciplinary approach is also required to address all phases of consequence management and post-incident investigations. The establishment of ongoing cooperation and collaboration helps ensure that capacity and capability are available, in advance, to manage the consequences of a bioterrorism event. The recent public health and animal disease outbreak events in Canada illustrate that the value of the cluster model goes well beyond direct bioterrorism response.

16. The laboratory cluster model allows for access to knowledge and expertise not readily available in any single department. The involvement of the cluster in supporting CFIA operations against Avian Influenza provided a good example of CRTI pan-cluster support, in terms of the deployment of specialized equipment and expertise, as well as an optimal use of leverage and resources within a system. The lab cluster experience has already demonstrated that ensuring the broadest possible participation amongst various organizations can ensure rapid access to knowledge, expertise, and capacities as vital components of a full response capability.

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