Health Canada Santé Canada

FEDERAL NUCLEAR EMERGENCY PLAN

LIAISON Newsletter

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In This Issue . . .

CRTI Approves Canadian Health Integrated Response Platform

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A new, Health Canada-led, research and development project has been recently approved by the chemical, biological, radiological, and nuclear (CBRN) Research and Technology Initiative (CRTI).

The Canadian Health Integrated Response Platform (CHIRP) project is a four-year, $4.8 million initiative ($1.9 million of which is CRTI funded) that will improve the alerting, surveillance and overall response capacity of Canada's public health system to a radio-nuclear event.

Project participants include Health Canada's Radiation Protection Bureau (RPB), the Public Health Agency of Canada (PHAC) Winnipeg Laboratory, Environment Canada's Canadian Meteorological Centre and two private sector partners.

With previous assistance from CRTI, the RPB's Nuclear Emergency Preparedness and Response Division has already implemented ARGOS —the Accident Reporting and Guidance Operational System. ARGOS allows for better monitoring, alerting, data gathering, analysis, decision support and information exchange to support emergency preparedness and response under the Federal Nuclear Emergency Plan.

PHAC has implemented the Canadian Network for Public Health Intelligence (CNPHI), also with previous CRTI funding. The CNPHI integrates relevant public health intelligence—strategic or interpreted data—into a common national framework that supports coordination between multi-level jurisdictions. Such coordination is needed to use data for early identification of risks to health, initiate rapid response and build response capacity.

CHIRP will help integrate communications functionality and build interoperability between ARGOS and the CNPHI. As a result, bidirectional automated alerting, electronic mapping, resource deployment and decision support will be enabled. CHIRP is expected to enhance the operations of both RPB and PHAC, allowing seamless interoperability between them, while maintaining security and defined roles with each organization.

Canada

National Biological Dosimetry Response Plan

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During a large scale radiological-nuclear (RN) emergency, many individuals may require assessment for radiation exposure: those exposed will need to be assessed quickly to determine whether medical intervention is needed and some first responders could also need to be assessed to determine whether they have exceeded their occupational limits for exposure.

Even in a localized event, many members of the public could demand that their radiation exposure be assessed. As very few people would have a personal radiation dosimeter, during an RN emergency such assessments can only be conducted using biological assays.

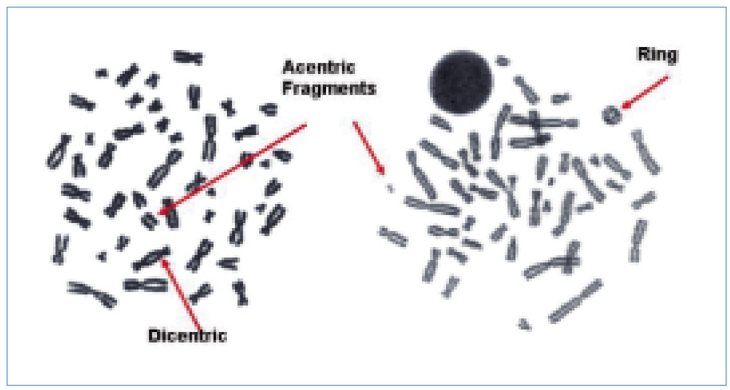
The National Biological Dosimetry Response Plan (NBDRP) has been developed to respond to such high demand situations.

Radiation causes many biological effects including specific damage to chromosomes. In humans, normal cells contain 23 pairs of chromosomes, each with a single centromere.

Normal chromosomes form an X and the centromere is at the centre

Radiation can break chromosomes which, when they attempt to repair, can form rings or chromosomes with two centromeres.

To detect radiation damage, white blood cells are analysed for the presence of dicentrics and rings. The dose received by an individual is then calculated by comparing the frequency of dicentrics and rings to calibration curves that have been prepared from blood samples irradiated with known doses.



Abnormal chromosomes showing fragments, rings and dicentrics due to exposure to radiation.

This assay—the dicentric chromosome assay (DCA) —has been used internationally for over 30 years and was standardized by a committee of the International Standards Organization.

To provide accurate biological dosimetry when conducting dose estimates for a small number of samples, up to 1000 cells per sample are used to detect doses down to 0.15 Gy. However, this is extremely labour intensive and time consuming, requiring three to four days to process the samples and at least four days for one microscopist to score the chromosomes from one person. During a large scale radiological event, performing the DCA becomes a huge undertaking.

To address this challenge, the Radiobiology Division, Consumer and Clinical Radiation Protection Bureau, Health Canada, is working to increase Canadian capacity for biological dosimetry.

As a first step, the detection threshold can be raised to 1.0 Gy, which is generally accepted as the dose above which an individual would require medical intervention, thereby reducing the number of cells that need to be scored. By counting only 50 cells, dose estimates can be made that are sufficiently accurate for triage purposes to identify those individuals who would require medical treatment.

The Division has also formalized collaborations with the research laboratories at Defence Research and Development Canada-Ottawa, the Chalk River Laboratories of Atomic Energy of Canada Limited and the McMaster Institute of Applied Radiation Sciences. This core group of reference laboratories have expertise in the DCA, having generated calibration curves for several radiation qualities, undergone intercomparisons and participated in Exercise Follow-On.

Clinical cytogenetic laboratories across the country were also approached to assist in scoring the dicentric chromosomes. The laboratories, though familiar with chromosome analysis but not specifically the DCA, were trained to score dicentric chromosomes, and they performed intra-laboratory comparisons that validated their ability to score for triage purposes.

Under the NBDRP and in an RN emergency, provincial authorities would contact Health Canada to provide biological dosimetry. The department would then contact the core laboratories, possibly including the cytogeneticists. Depending on the number of samples, they would either all be sent to Health Canada for processing or be distributed to any or all of the core laboratories. Once the slides are made, they could be sent to other cytogeneticists for scoring if the core laboratories are overwhelmed. The number of dicentrics scored would be returned to the labs for dose conversions and all dose information would be sent to a central location.

Even with this increased capacity, large scale RN events could still overwhelm available resources. The core reference labs are working concurrently to develop faster, automated methods to screen large numbers of samples that, in time, will be incorporated into the NBDRP.

With the development of the NBDRP and the research into these new methods of biological dosimetry, we are better prepared to meet the needs of Canadians in the case of a large scale RN event

Acknowledgements

We would like to thank the CRTI for support in the development of the NBDRP.

New CRTI Projects Announced

The CRTI has approved that fifteen new projects will receive $16.2 million funding to address CBRN threats. Of the funding, $15 million is for research, technology acceleration and technology demonstration projects. The remainder is directed toward new equipment for federal laboratories.

Two Health Canada projects have been approved:

- t.e.s.t which will address critical technology gaps in communications and information exchange for responders by using a wireless mesh topology
- the development of interoperability protocols and information technology for a national nuclear emergency laboratory network

For more information, please visit http://www.crti.drdc-rddc.gc.ca/en/publications/backgrounders/2006_02_14.asp

Portal Radiation Detectors Installed at the Port of Saint John

Canada's first portal radiation detectors, which allow customs officials to mass screen inbound cargo containers, were installed at the Port of Saint John, New Brunswick.

A cargo container is transported by truck through a portal monitor.

The installation is part of a $172 million plan by the Canadian Border Services Agency (CBSA) to improve marine security. Throughout 2006, additional detectors will be installed at all major Canadian marine terminals.

The portal detectors are primary components of the CBSA's Radiation Detection Program. They will be used with car-borne radiation detectors, hand-held detectors, dosimeters and RadNet–CBSA's network that connects the portal detectors to the CBSA's National Risk Assessment Centre (NRAC), located in Ottawa.

Under the program, all incoming containers must pass through the portals, which are installed directly on the docks. If they detect radiation above a preset level, an alarm is triggered and the information from the detectors is transmitted to the NRAC.

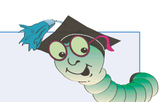
The NRAC determines if the alert should be cancelled or if the container should be targetted for further inspection. If the Centre does not clear a container, the terminal operator is contacted and the container is set aside for further screening by a car-borne detector, which is more sensitive and precise.

The majority of containers will not trigger an alarm, says the CBSA. Of those that do, most will be cleared because the NRAC assessment will determine that the cargo is legitimate or because the radiation detected was from naturally occurring sources.

A portal monitor

For more information about the portal detectors and the CBSA's Radiation Detection Program, please contact Jennifer Morrison. She can be reached at JenniferL.Morrison@cbsa-asfc.gc.ca.

Fun with Jumbles



1. cvieoaditra aecdy

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2. eormtseid

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3. ciaeunatvo

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4. octrolniea

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All terms can be found in our glossary:
http://www.hc-sc.gc.ca/ed-ud/event-incident/radiolog/info/glossary-glossaire_e.html

Exercise Ardent Sentry 06 Held

Ardent Sentry 06, a joint Canadian-United States security exercise, was held in May 1-19, 2006.

Ardent Sentry is a series of exercises, mandated by the US Congress, that involve the US Northern Command (NORTHCOM) and the North American Aerospace Defense Command (NORAD). The goal of all Ardent Sentry exercises is ‘assistance to civilian government.

For Ardent Sentry 06, the multi-day, multi-component exercise involved the Government of Canada, the Provinces of New Brunswick and Ontario, the State of Arizona, and the State of Michigan.

The exercise focused on a coordinated emergency response to a scenario that involved terrorism, critical infrastructure protection, cross-border co-operation, health and marine security.

In Canada, the exercise was jointly led by Public Safety and Emergency Preparedness Canada's (PSEPC's) National Exercise Division (NED) and the Department of National Defence–Canada Command J7 Training and Exercises. Participating in the exercise were NORAD/Northcom, Canadian Forces and 18 Government of Canada (GoC) Departments working from the Government Operations Centre, which was activated, as were Regional Coordination Groups, the GoC Marine Security Operations Centre Atlantic, and the Provinces of Ontario and New Brunswick Emergency Coordination Centres. The participation of other government departments' emergency operation centres was simulated.

The exercise was very successful and the feedback from participants has generally been positive and proactive in making suggestions for changes to plans and protocols. An After Action Report will be released later in the year. For more information about Exercise Ardent Sentry 06, please contact Jennifer Franssen, Manager, NED, PSEPC. She can be reached at jennifer.franssen@psepc-sppcc.gc.ca.

Profile:

FPT Coordinating Committee on R/N Emergency Management

Mandate

The mandate of the Federal Provincial/Territorial Coordinating Committee on Radiological-Nuclear Emergency Management (FPTCCRNEM) is to develop and implement a coordinated, national strategy for emergency management programs among the various Canadian jurisdictions for radiological or nuclear (RN) emergencies.

Mission

The committee's mission is to ensure coordinated national RN emergency management programs by:

- sharing knowledge and information, and
- providing advice and assistance to authorities responsible for RN mitigation, prevention, preparedness, response and recovery.

Membership

The FPTCCRNEM has a permanent membership, drawn from federal, provincial and territorial departments and organizations that have concerns and/or responsibilities in the event of an RN incident. The committee chair is the National Coordinator of the Federal Nuclear Emergency Plan (FNEP) and the co-chair is nominated from participating provinces.

Federal departments and agencies in FNEP include Public Safety and Emergency Preparedness Canada, the CBRN Research and Technology Initiative, the Canadian Nuclear Safety Commission, National Defence and Health Canada. Provincial and territorial representation is from emergency management organizations that are responsible for nuclear or radiological emergency preparedness.

Nuclear Emergency Preparedness and Response Division's Coordination and Operations Preparedness Section (COPS) provides secretariat support to the committee.

Fun with Jumbles–Answers

1. radioactive decay
2. dosimeter
3. evacuation
4. relocation

Our mission is to help the people of Canada maintain and improve their health.

Health Canada

LIAISON Submission Guidelines

LIAISON is published three times a year by Health Canada's Nuclear Emergency Preparedness and Response Division. LIAISON is an electronic newsletter dedicated to promoting a broad and open exchange of information relating to nuclear emergency preparedness and response in Canada, by objectively sharing news and information among stakeholders. Our vision is to foster a dedicated, visible and collaborative relationship among all stakeholders involved in radiological and nuclear emergency planning, preparedness and response for the benefit of all Canadians.

Articles submitted for publication: are welcome in either French or English; should focus on issues relating to nuclear emergency preparedness and response; should be less than 500 words (maximum) and written in layman's terms.

Please save your article in text (*.txt), Word (*.doc) or WordPerfect (*.wpd) format. If you have graphics to support your text, send them along! Images should be 150–300 dpi and in JPEG (*.jpg) or bitmap (*.bmp) format. Note that all articles will be edited for length and clarity prior to publishing. Accompanying images may or may not be used in accordance with editorial board decisions.

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Contact Us!

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