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- Department of Justice and Public Safety
- Horizon Health Network
- Ambulance NB
- NB Power, Point Lepreau Generating Station
- WorkSafe NB
- NB Trauma Program
- NB Funeral Directors and Embalmers Association
- RCMP
- Canadian Red Cross
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<td>ALARA</td>
<td>As Low as Reasonably Achievable</td>
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<td>ANB</td>
<td>Ambulance New Brunswick</td>
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<td>CMOH</td>
<td>Chief Medical Officer of Health</td>
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<tr>
<td>cps</td>
<td>Counts per second</td>
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<td>MOH</td>
<td>Medical Officer of Health</td>
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<td>Extra-Mural Program</td>
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<td>Emergency Medical Services</td>
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<td>Emergency Operations Centre</td>
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<td>EPR Branch</td>
<td>Emergency Preparedness and Response Branch (Department of Health)</td>
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<td>EPZ</td>
<td>Emergency Planning Zone</td>
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<td>IAEA</td>
<td>International Atomic Energy Agency</td>
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<td>KI</td>
<td>Potassium Iodide</td>
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<td>METER</td>
<td>Medical Emergency Treatment for Exposures to Radiation</td>
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<tr>
<td>mSv</td>
<td>Millisievert (unit of radiation exposure)</td>
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<td>NESS</td>
<td>National Emergency Stockpile System</td>
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<td>NB</td>
<td>New Brunswick</td>
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<td>NB EMO</td>
<td>New Brunswick Emergency Measures Organization</td>
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<td>NBHEOC</td>
<td>New Brunswick Health EOC</td>
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<td>OCMOH</td>
<td>Office of the Chief Medical Officer of Health</td>
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<td>PEOC</td>
<td>Provincial EOC</td>
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<td>PLGS</td>
<td>Point Lepreau Generating Station</td>
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<tr>
<td>REAC</td>
<td>Regional Emergency Action Committee</td>
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<td>RCMP</td>
<td>Royal Canadian Mounted Police</td>
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<td>RMOH</td>
<td>Regional Medical Officer of Health</td>
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<td>SJRH</td>
<td>Saint John Regional Hospital</td>
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PART I

PRINCIPLES, POLICIES AND PROCEDURES
1. OVERVIEW

1.1 Objectives

1.1.1 Aim

The aim of this plan is to promulgate the organization, responsibilities and actions necessary for an effective health system response to a nuclear emergency at the Point Lepreau Generating Station (PLGS) with impacts beyond the confines of the facility, which would pose danger to the general public.

1.1.2 Purpose

This plan supplements the all-hazards Provincial Health Emergency Management Plan as well as the Health Emergency Management Plans for Horizon Health Network (Horizon Health) and Ambulance NB (ANB), by providing information specific to nuclear hazards at PLGS. Part I (Overview) is authoritative and provides policy direction for all health system partners under the jurisdiction of the Department of Health (DH). Parts II (Health System Partners) and III (Reference Information) are informative and provide all stakeholders with an understanding of the roles of the health partners in nuclear emergency response. Part IV (Appendices) provides a location in which to file sub-plans produced by individual health system partners for their own internal use. Not all holders of this document will necessarily hold all sub-plans.

1.1.3 Goals of Health Nuclear Emergency Response

This plan enables the New Brunswick health system to achieve the International Atomic Energy Agency (IAEA) goals for medical response to nuclear or radiological emergency, which are to:

• save lives and perform required emergency medical procedures;
• treat radiation injuries and injuries resulting from an emergency situation; and
• perform required public health actions, including public advice and counselling.\(^1\)

1.2 Scope

1.2.1 Applicability

The primary focus of this plan is on health system responsibilities in the event of an off-site nuclear emergency at PLGS with some discussion of health roles in an on-site emergency at PLGS (see section 1.3.2 for details of an on-site versus an off-site emergency). Nonetheless, these principles, policies and procedures may be adapted if required for other potential nuclear emergencies such as the following.

- Deliberate release of nuclear material (e.g., a “dirty bomb” detonated by ideological extremists). The principles of health system response would be the same but circumstances might be different. For example, the scale of the problem might be greater; the geographical area may be other than southwest New Brunswick; health care facilities and sites might themselves be impacted; or first responders may face additional complications from being deliberately targeted themselves or constrained by law-enforcement considerations.

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\(^1\) International Atomic Energy Agency. Generic procedures for medical response during a nuclear or radiological emergency. (see References - Section 17)
1.2.2 Interprovincial and International Support

If a nuclear accident occurs in an adjoining Canadian province or U.S. state, the New Brunswick Emergency Measures Organization (NB EMO) may request the DH to provide expert augmentation. Any such arrangements involving health professionals from New Brunswick would be made under the provisions of the New Brunswick Annex to the Federal Nuclear Emergency Plan and would not require implementation of this plan.

1.3 Concept

1.3.1 Activation, Implementation and Deactivation

This document supplements the all-hazards emergency management plans of its participating organizations by addressing issues specific to a health nuclear emergency at the PLGS. Activation, implementation and deactivation of this plan are therefore concurrent with, and subordinate to, procedures defined by the respective all-hazards emergency management plans.

- **New Brunswick Health Emergency Operations Centre (NBHEOC) Organization.**
  The following schematic (Figure 1) depicts the modifications made to the all-hazards NBHEOC organization, specific to a nuclear emergency at PLGS with off-site implications: Liaison officers will include a link to the Provincial Emergency Operations Centre (PEOC) and to federal/provincial governments. The operations group will reflect the functional areas implicated in this Provincial Health Nuclear Emergency Plan, including a position unique to a nuclear emergency response, the Provincial Radiation Medical Advisor.
Figure 1. NBHEOC organization in a nuclear emergency at PLGS with off-site implications

- **Notification Alert Protocol for an Off-site Nuclear Emergency.** The following schematic depicts the modifications made to the all-hazards alert notification protocol, specific to a nuclear emergency at PLGS with off-site implications. The DH Provincial Emergency Action Committee member, members of the Nuclear Control Group and the Regional Medical Officer of Health for the Saint John Region will receive a direct notification alert from NB EMO. NBHEOC notification alerts will include additional members, specific to a nuclear emergency, as reflected in Figure 1, above. The fan-out is depicted as being more elaborate in Horizon Health and ANB than for other health system partners, due to their direct involvement in the response. The Public Agency of Canada (PHAC) Health Portfolio Operations Centre will be part of the initial alert to ensure adjoining jurisdictions are notified. Notification alert protocol for an on-site emergency at PLGS is described in Section 1.3.2.
Figure 2. Notification alert protocol in a nuclear emergency at the PLGS with imminent or actual off-site implications
1.3.2 Categories of Nuclear Emergency

Health nuclear emergency planning for an incident at PLGS is based on two broad categories of events defined by the Federal Nuclear Emergency Plan and associated federal regulations as on-site and off-site emergencies. These are illustrated in Figure 3 and described below.

- **On-site Emergency**
  
  If the impact of an incident can be contained within the Point Lepreau site, then PLGS is accountable for response in accordance with NB Power’s internal On-Site Contingency Plan.

  - **Health System Functions in an On-site Emergency.** If injuries from an on-site emergency do not involve radiation exposure or contamination (defined in Section 2.1), normal ANB procedures will apply. If a casualty(ies) have been exposed or are contaminated and require hospital services, they will be transferred to Saint John Regional Hospital (SJRH) in accordance with ANB procedures (see Section 11 – Emergency Medical Services) and the current Cooperation Agreement between Horizon Health Network and PLGS. The SJRH will receive a call directly from the PLGS shift supervisor to the SJRH Emergency Department Nursing Team Leader providing an alert notification of an incoming patient with potential contamination. ANB will also alert the SJRH emergency department per established protocols. This will allow adequate time for the preparation of staff, treatment areas, equipment and supplies, including department lock-down, placement of signage, set up of care area, radiation detectors, decontamination equipment, personal protective equipment and waste disposal..

- **Off-site Emergency**

  If the impact of an incident extends beyond the confines of the Point Lepreau site and presents a danger to the general public, the off-site response becomes the responsibility of federal, provincial and municipal levels of government, in accordance with the Federal Nuclear Emergency Plan. The province assumes primary responsibility through the NB EMO, as detailed in the province’s Point Lepreau Nuclear Off-Site Emergency Plan.

1.3.3 PLGS Emergency Classifications

PLGS emergencies will be classified according to the following:

- **Radiation Alert** - An event has occurred leading to higher than normal radiation levels, limited to the Point Lepreau property perimeter. At this emergency classification level, the DH will be monitoring with no active response required.

- **Site Area Radiation Emergency** - An event that affects territory within the PLGS property perimeter only. Preparations shall be made to take protective actions off site, should they be required. At this emergency classification level, the DH will fully activate the health system emergency response structure.

- **General Radiation Emergency** - An event involving an actual or substantial risk of release of radioactive material or radiation exposure that warrants taking urgent protective actions outside the boundary of the Point Lepreau site. At this emergency classification level, the DH health system emergency response structure remains fully activated.
1.3.4 **Health Services Command and Control**

Command and control of health services will be exercised as follows and as illustrated in Figure 4.

- **Strategic Command, Control and Coordination.** Strategic command, control and coordination of the provincial response will be directed through the PEOC Nuclear Control Group. Strategic command, control and coordination of the provincial health system response will be directed through the NBHEOC in close collaboration with the PEOC Nuclear Control Group, Horizon Health EOC, and ANB EOC. Regional health operational response command, control and coordination will be directed by Horizon Health and ANB through the SJRH EOC and ANB EOC, respectively. The EOCs for Vitalité Health and Service NB (Health Services) may activate, as required (see Section 1.6.6 and 1.6.7 for details).

The Technical Advisory Group (TAG) is part of the PEOC. The primary mission of the TAG is to guide the overall analysis and technical assessment of the response, including the coordination of radiation monitoring and surveillance activities, analysis
of the results of monitoring efforts, and providing recommendations on the adoption of emergency protective actions, i.e. countermeasures that must be taken promptly, in order to be effective. Health is represented in the TAG through the Chief Medical Officer of Health and the Provincial Radiation Medical Advisor.

In the field setting, command and control of health services will be exercised as follows, and as illustrated in Figure 4. Depending on the circumstances, health system responders may be required to deploy to Monitoring and Decontamination Centres (MDCs), reception centres (see Sections 5.4 to 5.5).

- **Field Command, Control and Coordination.** Health personnel with roles in the MDCs will report to an assembly area established by NB EMO, which will include the Command Post, Personal Protective Equipment trailer and tent, and an administrative tent with food and water supplies. In this assembly area, health personnel will be registered, briefed and provided with Personal Protective Equipment (PPE). Shift changes will occur in this area.

Horizon Health services operations will be coordinated through a Horizon Health Services Coordinator located at each of the two MDC Field Command Posts established in the assembly areas of the MDCs, outside the Plume Exposure Emergency Planning Zone (see Section 5.1.1 for definition) by NB EMO. The Coordinator’s role is to represent the various health services roles in the field to coordinate operational activities, relay tactical issues, as well as access and communicate information and expertise from the SJRH EOC such as changes in clinical guidelines and advice required by field health workers. Field health workers will communicate to the Horizon Health Coordinator in the Command Post via NB EMO staff positioned at each station in the field. SJRH EOC will remotely provide tactical support, guidance, direction and coordination for each of health services in the field through the Health Services Coordinators in the two Field Command Posts. Similarly, ANB field operations coordination will be provided through a single ANB Operational Support Unit responsible for both MDC Field Command Posts. The ANB coordinator will also communicate with the ANB EOC situated in Moncton.

A Canadian Red Cross Control Centre will be established at each primary reception centre, established on either side of the area being evacuated. A Red Cross Site Manager will be assigned to each to provide oversight and may also have responsibility for secondary reception centres, if activated. Each health organization will each assign a lead while they are on-site and report to the Control Centre, to ensure a liaison function within the Red Cross Control Centre. Health system organizational leads are not necessarily dedicated positions i.e. the roles may be assigned to individuals fulfilling a specific Health role in the reception centre.
1.4 Guiding Principles

The following guiding principles govern health system response to any nuclear incident.\(^2\)

- **Contamination with radioactive materials is not immediately life-threatening.** Decontamination procedures are straightforward; removing clothing and washing the body thoroughly with soap and water will eliminate most external contamination (see Section 3.2).

- **Treatment of traumatic injuries takes precedence over decontamination.** The radiation precautions defined in this plan are generally adequate to provide protection for first responders, emergency medical personnel, and clinicians.

- **Fear of radiation may be a greater hazard than radiation itself.** Unfamiliarity with radiation can breed unwarranted fear of the unknown. Accurate and timely information, clearly communicated, are vital. Well-managed communication prior to

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\(^2\) Adapted from Population Monitoring in Radiation Emergencies: a Guide for State and Local Public Health Planners (see References – Section 17).
and during an incident will help to lessen public fear and allow people to make informed decisions.

- **Inter-agency and multi-jurisdictional coordination and partnership.** The NB Annex to the Federal Nuclear Emergency Plan states that a nuclear emergency “will require a coordinated response at all levels; federal, provincial and regional in accordance with, and respect of, the authorities and jurisdictions of each order of government, and in accordance with relevant federal and provincial agreements.” In addition, there may be private sector resources within the region (e.g., radiation specialists) that could augment health system capabilities.

- **Initial off-site monitoring focus is on preventing acute radiation health effects.** Initial population monitoring activities should focus on preventing acute radiation health effects. Cross-contamination issues (spreading of radioactive materials from one person, object or place to another) are a secondary concern, especially if the contaminated area or the affected population are large.

- **Scalability and flexibility.** Scalability and flexibility are important considerations in response. Two examples will illustrate. First, unless the emergency is clearly under control and unlikely to escalate, everyone who may be required to respond should report for duty unless otherwise instructed. It is simpler to stand down those not required than to scale up if the situation deteriorates quickly. Second, in an off-site emergency, the radiation survey methods or screening criteria for initial monitoring may have to be adapted to the severity and magnitude of the incident and availability of resources.

### 1.5 Planning Assumptions

*Planning assumptions ending with an asterisk indicate a policy decision as well as a planning assumption.*

#### 1.5.1 General

- Because of the safety features of the PLGS, any accident at the plant is likely to provide some warning time before any release of radiation occurs.
- A nuclear event at PLGS may result in a nuclear emergency with widespread distribution of radioactive material, potentially resulting in injuries to workers and requiring a 20 kilometre evacuation of the area around the station.*
- The general public within the 20km evacuation planning zone could be externally contaminated by the release of radioactive material dispersed widely in a plume.\(^3\)
- The 20km evacuation planning zone consists of:
  - approximately 3,110 residents, including seasonal residents;
  - 850 PLGS plant workers;
  - transient residents, such as patrons of the New River Beach provincial park could bring the number of residents to as high as 5,000 (this number includes PLGS employees, permanent residents, transient residents and extra PLGS workers that would be expected to be on-site during a plant maintenance closure);
  - 20 to 40 Extra-Mural Program clients (some expected to be non-ambulatory);

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\(^3\) Radiation Event Medical Management (REMM) website. www.remm.nlm.gov (see Section 17 – References)
o one special care home (10 beds, level 1 & 2 residents) and zero nursing homes.

- PLGS will be able to manage the decontamination and transportation of their approximately 425 employees out of the contaminated area.
- The scale of the morbidity and mortality attributable to a particular radiation emergency may be unclear for a prolonged period.\(^4\)
- When radioactive material has been released by PLGS, there is a 99% probability that the risk of deterministic (morbidity or mortality) effects will be zero beyond approximately 1 km from PLGS. Beyond 3 km there is a 99.4% probability that the risk of deterministic effects will be zero.\(^5\)
- Where PLGS declares a General Radiation Emergency, there will also be a provincial “Declaration of a State of Emergency” by the Minister of Justice and Public Safety.
- The consequences of a nuclear event at the PLGS will implicate multiple jurisdictions, departments/agencies and orders of government.
- A nuclear emergency will likely have a major effect on the well-being of New Brunswickers; the psychological and social implications on individuals and communities may be severe and could potentially outweigh the medical implications. In particular, evacuees will be distressed for a number of reasons such as having to leave their homes, fear of radiation, uncertainty about the future and the invasiveness of the decontamination process. There will be a need for information and psychosocial support. Access to mental health services and public health information will be required.
- Where there has been a release of radioactive material, affected residents within the 20km evacuation planning zone may not be able to return to their homes for a period of time, until risk assessment and remediation activities have been completed.
- There may be circumstances under which residents will be asked to shelter-in-place. This may be the most appropriate option if the safety risk to evacuate is too high or the risk of exposure during evacuation outweighs the utility of attempting to evacuate.
- Approximately 10% of the population in the 20km emergency planning zone (311 people) will evacuate the area through unmonitored egress points, i.e. not through the established traffic control points on Highway 1. Those with a perceived risk of contamination may self-present at a location such as reception centres or emergency departments, seeking radiation monitoring.\(^6\)
- The recovery phase of the emergency response will be extensive and potentially of long duration.

### 1.5.2 Evacuation and Decontamination

- In the event of a precautionary evacuation, evacuees will have the choice to egress to either the east or west of the 20km evacuation planning zone, through the established traffic control points on Highway 1 (Prince of Wales interchange to the east and Pennfield Ridge to the west). Evacuees will egress east and west in equal numbers.

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\(^{4}\) International Atomic Energy Agency. *International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources.* (see Section 17 – References)


• If an evacuation occurs after or during a release of radioactive material, authorities will direct evacuees to egress east or west only if it is deemed necessary for safety reasons by the Nuclear Control Group i.e. depending on the direction of the plume. 

• Only those (2,500 residents and PLGS workers) within the 12km radius of PLGS will be at risk of contamination. After a release of radioactive material, 1 in 5 evacuees will be contaminated (500 contaminated; 2,000 uncontaminated).

• The decontamination process through the

• The MDC process will take 10 to 15 minutes per evacuee.

• The decontamination process (excluding non-contaminated evacuees, radiation monitoring and registration) based on a full evacuation scenario of the 20km emergency planning zone will be completed within 24 to 48 hours. 

• During the decontamination process at the MDC, the removal of all clothing will reduce contamination on the evacuee up to 90% and rapid washing of exposed skin and hair will remove an additional 5%, for a total of 95% reduction in contamination. 

• If there has been a release of radioactive material, no privately-owned vehicles from the emergency evacuation zone will be permitted past the traffic control points.

• Evacuees may experience long wait times in the pre-decontamination area.

• Up to five portal monitors will be added to each MDC in the pre-decontamination area, as required to relieve wait times for evacuees.

• No privately owned vehicles (from evacuees) will proceed from the emergency evacuation zone.

• School buses will be used to transport non-contaminated and decontaminated evacuees to reception centres. At any given time there will be a bus on route to reception centres, one returning from reception centres, and another remaining at the MDC for boarding.

• Some evacuees will be non-compliant with the monitoring and decontamination process. Non-compliant evacuees will be quarantined to protect public safety and limit the spread of contamination.

• PLGS will manage on-site decontamination and transportation of on-site employees. If PLGS employees are egressing after a release of radioactive material however, they will need to be screened and if necessary, decontaminated via the MDC. Health personnel within the MDC will not be required in this instance.

1.5.3 Pre-hospital (excluding MDC and reception centres) and Hospital Services

• The SJRH will serve as the designated hospital for receiving contaminated casualties.

• There will be a need for staff redeployment from within Horizon Health and ANB based on identification of essential services and prioritization of services.

• Support from Vitalité Health as mutual aid for human resources, will be provided if required, to create surge capacity for Horizon Health.

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8 Assuming 1 in 5 are contaminated (500), 2 decontaminated sites activated, 2 lines within each site, 10 minute lag between evacuees; 6 decontaminated per hour: 500÷4 lines = 125; 125÷6 per hour = 21 hours (conservative estimate without any contingency factored in).

• A large surge of inpatients will not be as a result of the emergency, although the specialized needs of contaminated casualties and potential cases of acute radiation syndrome will place significant strain on the SJRH.

• For the first 24-48 hours after the media announces a release of radioactive material from PLGS and a declaration of a provincial state of emergency, there will be a surge in ‘worried-well’ visits to the Charlotte County Hospital (CCH), SJRH and St. Joseph’s Hospital. Other facilities in the region, such as Sussex Health Centre, Deer Island Health Centre, Campobello Health Centre, Grand Manan Hospital will experience a lesser surge in ‘worried-well’ visits.

• Requests for Potassium iodide (KI) and reassurance monitoring (for contamination) will be the biggest factors influencing the number of ‘worried well’, particularly where there has been a release of radioactive material prior to evacuation. Specifically, approximately 10% of the population in the surrounding area (12,500 in the Greater Saint John Area and 2,655 in Charlotte County) will present as ‘worried well’ for radiation monitoring, regardless of whether or not they have been exposed.10

• Mass Casualty protocols may be activated by the SJRH to manage the surge in ‘worried well’ and/or casualties related to the emergency.*

• The response time for accessing radiological decorporating agents from suppliers in the event of a nuclear emergency, will be a minimum of 5-6 hours and up to 24 hours.

• The SJRH decontamination system has the capacity to decontaminate 9 to 18 people before the cistern capturing waste water would need to be emptied.

• Upon request, NB Power laboratory services can provide personnel and portable equipment to the SJRH for identifying isotopes from human samples and for obtaining whole body radiation measurements, to support physicians in the treatment of acute radiation syndrome.

• Those from the 20km emergency evacuation zone who bypass traffic control points and the MDC will:
  o present for emergency department and/or emergency social services within 24 hours of the evacuation order, once they realize they may be contaminated;
  o require registration with Red Cross, as they will be considered evacuees.

1.5.4 Reception Centres

• Twenty to 25% of evacuees (622 to 778 people) from the 20km emergency planning zone will stay overnight in a reception centre.

• Sheltering of evacuees in a reception centre will not exceed seven days/nights before relocation to other suitable accommodations such as a hotel or with a family member. After 72 hours, the number of people remaining in reception centres will be close to zero.

• There will be an increased risk of communicable disease or illness in reception centres, with longer durations of stay.

• Some evacuees will not be able to access their family physician or prescription medications and may require these services while in reception centres, particularly for existing chronic health conditions.

1.5.5 Management of Contaminated Decedents

- Restrictions to cultural or spiritual practices may be required where there is risk of contamination or exposure to funeral home staff, family and friends of the deceased.\textsuperscript{11}

- Radiation-specific precautions (such as special burial procedures or personal protective equipment) will not be required for decedents with exposure to radiation without contamination. Normal procedures can be followed and the decedent can be released to the funeral home (or SJRH if Coroner Services orders an autopsy).\textsuperscript{12}

- Any deterministic effects resulting from a nuclear emergency at PLGS will likely be an employee of PLGS.

- It is plausible for a decedent to be contaminated if the death occurred at PLGS, within the 20km emergency evacuation zone, one of the MDCs or in hospital after having been transported from one of these three areas.

- A decedent may be contaminated with radioactive material but the contamination will not have been the cause of death.

- Internal contamination in a decedent is not volatile and will remain until natural radioactive decay is complete. The dose rate outside of a body with internal contamination will be small.\textsuperscript{9}

- A radiological event at PLGS leading to an injury to workers involving a radioactive embedded object will be an unlikely scenario; the probability of such an event however, will not be zero.

- Contaminated decedents will be transported and decontaminated only after the emergency has been contained and all live evacuees have been decontaminated and brought to safety.

1.5.6 Communications and Public Messaging

- A nuclear emergency will create intense public and media interest.

- There will be widespread circulation of conflicting information, misinformation and rumours.

- Tele-Care 811 will experience an intense surge in call volumes largely related to general information inquiries, particularly in the first 24 to 48 hours; however an increased demand will persist for a prolonged period of time.

1.6 Responsibilities

1.6.1 Federal Government

Overall responsibilities with respect to nuclear emergencies in Canada are defined by the Federal Nuclear Emergency Plan. The federal government is responsible for the development, control and regulation of peaceful uses of nuclear energy, manages nuclear liability, and coordinates with and provides support to provinces in their response to a nuclear emergency.


1.6.2 **Provincial Government**

Under the *Federal Nuclear Emergency Plan*, provincial governments have primary responsibility for protecting public health and safety, property and the environment within their borders. Accordingly, the Province of New Brunswick has issued the *Point Lepreau Nuclear Off-Site Emergency Plan*, containing basic information, detailed responsibilities and immediate actions required as well as specific responses by relevant agencies. For purposes of health response, the following are the primary provincial government partners.

- **Department of Justice and Public Safety.** Responsibility for coordination of an off-site nuclear emergency rests with the provincial Nuclear Control Group (Control Group), normally established at the PEOC in Fredericton.

- **Department of Health.** Responsibility for the coordination and management of the health system response in an off-site nuclear emergency rests with the NBHEOC Management Group. This includes coordination of the delivery of medical, mental health, and public health services in or affecting the province (or any part of the province). Responsibilities include, but are not limited to: the continuity of health services, supporting other provinces/adjoining US States and the federal government, and providing assistance to the RHAs and ANB. The DH is also responsible for event-specific policy direction and authorizing extraordinary spending.

- **NB Power.** As the Nuclear Generating Station Operator, NB Power is responsible for on-site emergency planning, preparedness and response.
  - In the event of an *on-site emergency*, the PLGS Shift Supervisor will activate a Contingency Desk which will become the point of contact between the plant and external agencies.
  - In the event of an *off-site emergency*, PLGS will activate and then manage off-site aspects of the emergency from its Offsite Emergency Operations Centre located away from the plant. It will be used as a communications centre from which radiation surveys will be directed. Communication links with NB EMO are set up from this location.

1.6.3 **Municipal Government**

PLGS is located in the County of Saint John but beyond the boundaries of the City of Saint John. Emergency management at the local level is therefore the responsibility of the municipality of Saint John. In event of a fire at PLGS, the Musquash Volunteer Fire Department responds with the support of the Saint John Fire Department, which holds a contract with NB Power to provide fire suppression at the plant. Saint John Fire Department also operates a Hazardous Materials Emergency Response Service, one of two or three such teams in the province.

1.6.4 **Horizon Health Network**

The Horizon Health EOC Executive Management Group is responsible to the Minister of Health through the Deputy Minister for delivery of most (but not all) nuclear emergency health services to the affected population. Horizon Health will receive its policy direction from the DH through NBHEOC Management Group when activated. Horizon Health is also responsible for continuity of essential health services to the population within Horizon Health. At the corporate level this
means responsibility for policy, planning and readiness, and coordination and oversight of response.

In an on-site or off-site emergency, the SJRH will be the designated medical facility for the treatment of radiation-related injuries and for receiving contaminated casualties requiring medical treatment from within the 20 kilometre emergency evacuation zone, PLGS, and both MDCs. The SJRH designation is based on the following criteria:

- Level 1 trauma facility with the necessary infrastructure and 24/7 medical and surgical specialist coverage;
- Critical care capability, advanced laboratory, diagnostic imaging, pharmaceuticals, and other support that may be needed to care for a patient experiencing acute radiation syndrome;
- Availability of critical care specialists and a range of allied health professionals on a 24/7 basis;
- On-site Radiation Medicine and Nuclear Medicine specialists;
- Approximate location to PLGS.

1.6.5 Ambulance NB

ANB is responsible to the Minister of Health through the Deputy Minister for the delivery of ambulance services to the PLGS, at MDCs, and at reception centres. ANB will receive its policy direction from the DH through NBHEOC Management Group when activated. ANB is responsible for the continuity of service to the community at large throughout the emergency response.

1.6.6 Vitalité Health Network

Although not directly involved in a Point Lepreau off-site nuclear emergency response, Vitalité Health is part of the NBHEOC. They will monitor and maintain situational awareness throughout the response and may be called upon to support Horizon Health to increase surge capacity, if resources are overwhelmed.

1.6.7 Service NB (Health Services)

Although not directly involved in a Point Lepreau off-site nuclear emergency response, Service NB (Health Services) is part of the NBHEOC. Service NB (Health Services) as a GNB departmental division is integrated in Horizon Health and will be depended upon for supporting Horizon Health with required supply chain and information systems needs throughout the response.

1.7 Readiness

Operational readiness for health nuclear emergencies is achieved through the three pillars of education, training and exercises. Nuclear emergency matters are to be incorporated as an integral part of the education, training and exercise programs of the DH, Horizon Health and ANB and all other regional partners, in cooperation with PLGS and NB EMO. Exercise requirements specific to nuclear emergencies are promulgated in the New Brunswick Annex, Federal Nuclear Emergency Plan. Guidance for managing exercises may be obtained from the DH Exercise Planning Manual (see Section 17 – References).
1.8 Plan Management

1.8.1 Distribution, Location and Accounting

Responsibility for production, distribution, review and amendment of this Health Nuclear Emergency Plan for the Point Lepreau Generating Station is the responsibility of the Director, Emergency Preparedness and Response Branch (EPR Branch) of the DH. S/he will distribute paper or electronic copies as required to achieve effective emergency preparedness and response and posting final copies on the central repository housed on the DH external Sharepoint site for DH EPR Branch, accessible to the Provincial Health Nuclear Planning Committee, ANB, Service NB (Health Services), Horizon Health and Vitalité Health. To ensure that all documentation in circulation is current and accurate, photocopies are not to be made without approval from the Director, EPR Branch and are to be clearly identified as copies. Distribution of sub-plans is at the discretion of the respective health system partner, each of which is responsible for review, updating and amendment of its own sub-plan.

1.8.2 Review and Continuous Improvement

To be effective, an emergency plan must be constantly reviewed, tested and updated. Each emergency or exercise is an especially important opportunity to assess its effectiveness and to incorporate new lessons. Although the Director, DH EPR Branch has ultimate responsibility for keeping this plan current and effective, it is incumbent on all holders to suggest amendments or improvements as soon as the requirement becomes evident. Periodic reviews are to be conducted as follows:

- a validation check one year after initial promulgation;
- a formal review every three years thereafter; and
- an operational review as required, and as part of the follow-up procedure following any real or exercise event.

1.8.3 Amendment

The Director, DH EPR Branch, will make routine corrections and amendments as required to reflect existing policy and direction. When more substantive changes are required, s/he will coordinate the proposed amendment with all relevant stakeholders. When any amendment is published, the Director, DH EPR Branch will arrange for distribution of a copy to each custodian, who is then responsible for updating his or her documents. When changes are substantive, custodians are to ensure that all personnel with health nuclear emergency responsibilities in their organization are made aware of and understand the change. As part of NB EMO’s annual cycle of provincial nuclear plan updates, any changes to the Provincial Health Nuclear Emergency Plan for the Point Lepreau Generating Station affecting the Point Lepreau Nuclear Off-Site Emergency Plan will be submitted by March of each year through the DH EPR Branch (as the DH Provincial Emergency Action Committee member).
2. RADIATION AND HEALTH

2.1 Exposure versus Contamination

Someone who has been exposed to radiation is not necessarily contaminated.

- **Exposure** means that an individual has experienced radioactive waves or particles penetrating their body. An x-ray, for example, is a harmless form of exposure.
- **Contamination** means that an individual has radioactive material on their clothing or skin, or inside their body through inhalation, ingestion or a wound.

Patients who have been exposed but not contaminated do not require radiation safety precautions. Contaminated individuals, however, require decontamination for their own safety and that of caregivers. Decontamination involves careful removal and disposal of clothing followed by washing of the skin using specific procedures (see Section 3.2).

2.2 Health Impact of Radiation

Experience has shown that fear of radiation can have a greater impact on a population than the effects of a nuclear incident itself. It is therefore important that all those who have health nuclear emergency management responsibilities, and who may interact with the public, understand the principles. It is equally important that key messages and clear explanation of the issues be part of the communication strategy. An overview of key concepts and principles of radiation is provided in Box 1 on the following page.

2.3 Potassium Iodide (KI)

Potassium iodide (KI) pills are distributed periodically, free of charge, to every residence within 20 kilometres of PLGS. Contingency supplies are also stockpiled by NB EMO and at selected Horizon Health facilities and sites, selected Royal Canadian Mounted Police (RCMP) detachments, and the Musquash Fire Department. A KI protocol and advisory will be issued by the Office of the Chief Medical Officer of Health (OCMOH) in real time, as required during an event. To prevent misunderstanding and misuse, clear explanation of KI use must be part of the provincial communication strategy (refer to Point Lepreau Nuclear Off-Site Emergency Plan). Health messaging such as those delivered through Tele-Care 811 must be integrated provincially for consistency. An overview of key concepts and principles is provided in Box 2 on page 10.

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13 A good case study is provided in Osif, et. al., *TMI 25 Years Later: The Three Mile Island Nuclear Power Plant Accident and its Impact* (see Section 17 - References).
Box 1: Radiation and Health Factsheet

Radiation
As unstable atoms decay, they release radiation in the form of electromagnetic waves and subatomic particles. Some of this radiation can detach electrons from other atoms (ionize) as they pass. Alpha and beta particles, and X-rays and gamma rays, are forms of ionizing radiation. Non-ionizing radiation, such as microwaves or radio waves, do not change the structure of atoms.

Types of Health Effects
High doses of ionizing radiation can damage or destroy cells, resulting in serious health effects or even death, depending on the level of radiation dose received. These are known as deterministic effects because they can be determined to be a direct result of radiation exposure. Examples include burns, cataracts, sterility, and in extreme cases, death. Short-term, high-level exposure is referred to as ‘acute’ exposure. Health effects from acute exposure usually appear quickly, e.g., burns and radiation sickness. Radiation sickness is also called ‘radiation poisoning.’ It can cause premature aging or even death. If the dose is fatal, death usually occurs within two months. The symptoms of radiation sickness include nausea, weakness, hair loss, skin burns or diminished organ function. Sometimes the effects of a radiation dose are not immediately observable; therefore no direct connection can be made between the radiation dose and its possible effects. These are referred to as stochastic effects. Increased levels of exposure make stochastic effects more likely to occur, but do not influence the type or severity. Examples include an increased incidence of cancer in exposed persons and the possibility of genetic effects in their offspring.

Effects on Cells
Ionizing radiation affects living tissue on a cellular level by breaking chemical bonds and altering the structure of the molecules. Three things can happen to a cell as a result.

1. **The cell may repair itself.** If this case there is no effect on the body.
2. **The cell may mutate.** If radiation affects the cell’s genetic coding (DNA), it may result in abnormalities when the cell divides and multiplies. In this case, there are three possible results: the cell may be destroyed by the immune system; it may survive but lose some function; or it may survive but be dysfunctional. In the first two cases there is no effect on the body. In the third case, dysfunction may result in cancers, reproductive failures, or genetic effects.
3. **The cell may die.** There are three possibilities when cells are killed by radiation. If only a few cells die, the body will heal itself and survive. If more cells are killed, the body may survive but with prolonged symptoms. If too many cells are killed, the person will die.

Contamination
People who are externally contaminated with radioactive material can contaminate other people or surfaces that they touch. For example, people who have radioactive dust on their clothing may spread it when they sit on chairs or hug someone. People who are internally contaminated can expose people nearby to radiation from the material inside their bodies. The body fluids (blood, sweat, saliva, urine) of an internally contaminated person can contain radioactive materials. Coming in contact with these body fluids can result in contamination and/or exposure.

Dose Limits
Everyone is continually exposed to low levels of naturally occurring ionizing radiation. Normal exposure to human-made ionizing radiation occurs during X-rays, or in nuclear medicine. For public exposure, the dose limits are:

- a) An effective dose of 1 mSv in a year;
- b) In special circumstances, a higher value of effective dose in a single year could apply, provided that the average effective dose over five consecutive years does not exceed 1 mSv per year;
- c) An equivalent dose to the lens of the eye of 15 mSv in a year;
- d) An equivalent dose to the skin of 50 mSv in a year.

(IAEA, 2014)

Sources
- US Environmental Protection Agency. www.epa.gov/radiation/
Box 2: Potassium Iodide (KI) Factsheet

Description
Potassium iodide (KI) is a blocking agent that comes in the form of a tablet. It protects the thyroid gland against absorption of radioactive iodine.

How it Works
The normal thyroid gland collects naturally-occurring iodine manufactured by the body or consumed in food and medicine. Accidental release of a nuclear plume could release a radioactive form of iodine into the air. That may cause internal contamination if it is breathed into the lungs or ingested with contaminated food or water. The thyroid gland would then absorb and retain this radioactive chemical. An appropriate dose of KI taken before exposure can prevent this by filling the thyroid with harmless iodine. Any radioactive iodine will then simply be excreted in the urine. It is important to remember that KI is a preventive (prophylactic) measure and must be taken before exposure.

Effectiveness
The effectiveness of KI in blocking radioactive iodine depends on how quickly the KI is taken (the sooner the better), how fast it is absorbed into the blood and the amount of radioactive iodine to which a person is exposed.

Instructions
KI should be taken as advised by public health or emergency management officials. Taken as instructed, KI can lower the amount of radioactive iodine that is retained in the body and lower the risk of serious damage to the thyroid gland. A single initial dose of KI protects the thyroid gland for 24 hours and, except in extreme cases, should be all that is required. Repeat doses should only be taken on the advice of public health or emergency management officials. Repeat doses should not be taken by pregnant and breastfeeding women or newborn infants (less than 1 month old). The area should be evacuated until levels of radioactive iodine in the environment fall. Taking a higher dose of KI, or taking KI more often than recommended, does not offer more protection and can cause severe illness or even death.

Risks and Side Effects
KI may be harmful for some individuals because of the high levels of iodine it contains. In general, however, the benefits of taking KI outweigh the risks for all age groups. If it is taken properly and as directed, KI is unlikely to have side effects except, in some cases, intestinal upset, allergic reactions, rashes or inflammation of the salivary glands. People with the following conditions should seek medical advice before taking KI pills:

- allergies to iodine (note that a seafood or shellfish allergy does not necessarily mean an allergy to iodine); or
- skin disorders such as dermatitis herpetiformis or urticaria vasculitis.

People with thyroid disease (for example, multinodular goiter, Graves’ disease or autoimmune thyroiditis) may be treated with KI, but under careful supervision of a physician, especially if dosing lasts for more than a few days.

Location of Stocks
KI pills are distributed periodically, free of charge, to every residence within 20 kilometres of PLGS. Contingency supplies are also stockpiled by the NB EMO at selected Horizon Health facilities and sites, selected RCMP detachments, and the Musquash Fire Department. If an evacuation is ordered, pills will also be made available at reception centres.

Sources
- Population Monitoring in Radiation Emergencies: a Guide for State and Local Public Health Planners (see References)
3. MANAGEMENT OF CONTAMINATED INDIVIDUALS

3.1 Overview

The relevant guiding principles governing care for contaminated individuals are that contamination with radioactive materials is not immediately life-threatening and that treatment of traumatic injuries takes precedence over decontamination (see Section 1.4). Within Horizon Health facilities and sites, procedures outlined in this document should be consistent with those promulgated for Emergency Code Brown (Radiological).

3.2 Decontamination of Patients and Evacuees

The Provincial Health Nuclear Emergency Plan for PLGS has been written in the context of the full concept of operations for the decontamination of evacuees as per the Point Lepreau Nuclear Off-Site Emergency Plan. The concept of operations includes an MDC on both side of the emergency evacuation zone (see Section 5.1.1) and the capability for the SJRH to receive potentially contaminated casualties from PLGS, from within the 20km emergency evacuation zone, or from either MDC.

3.2.1 Decontamination Responsibilities

Contaminated patients from the PLGS facility will, if possible, be decontaminated by PLGS radiation protection qualified staff to the extent possible before transport by ambulance to SJRH. Anyone exposed or contaminated during an incident at the PLGS site will, without exception, be transported to the Emergency Department at SJRH in accordance with PLGS, SJRH and ANB protocols. PLGS employs specially trained radiation protection qualified staff whose function is to manage potentially exposed or contaminated patients on-site. PLGS radiation protection qualified staff will always accompany the ambulance when a contaminated patient from PLGS is being transported to the receiving facility i.e. SJRH.

As previously discussed, SJRH is the designated facility for the receiving contaminated evacuees from PLGS, within the emergency evacuation zone and from both MDCs who require medical treatment or who fail decontamination. As the designated hospital for receiving radiation contaminated casualties, the SJRH is required to maintain a detailed internal plan and exercise it periodically. Further details on decontamination issues in a Point Lepreau off-site nuclear emergency are addressed in Section 5.

3.2.2 Decontamination Procedures

The principles of decontaminating individuals requiring medical treatment are described in Box 3 on the follow page. Authoritative protocols for individual organizations are promulgated in the relevant organization level plans. For decontamination in the field for evacuees not requiring medical treatment, refer to the Point Lepreau Nuclear Off-Site Emergency Plan.
4. STAFF RADIATION PROTECTION, PROCEDURES AND PRACTICES

4.1 Principles of Protection

Health workers require protective measures when dealing with contaminated patients. It is important to remember, however, that patients who have been exposed but not contaminated do not pose any radiation hazard. The aim of staff protection is to maintain exposure and contamination at levels “as low as reasonably achievable” (ALARA). This is achieved by monitoring radiation and minimizing exposure.

4.2 Detection and Monitoring

Levels of exposure to workers will be monitored in several ways, depending on the setting. Some workers will wear Thermoluminescent Dosimetry (TLD) badges or Direct Reading Dosimeters. For others, exposure will monitored through the measuring of environmental dose rates and logging of time spent in that environment. Others will use a buddy system with PLGS radiation protection qualified staff that will be wearing a dosimeter and monitoring and advising on safety and compliance. Referring to the Point Lepreau Off-site Nuclear Emergency Plan, NB Power staff will be responsible for dosimetry in contaminated areas and the NB EMO Field Command Post will maintain an Emergency Worker Radiation Exposure Log to monitor individual workers’ radiation dose through recording dose rate and numbers of hours worked in their assigned area.

Health system organizations holding meters and badges are responsible for accounting for inventories in their internal organization-level plans. In a co-operation agreement between Horizon Health and PLGS, PLGS staff will provide radiation dosimetry and contamination monitoring equipment to the SJRH emergency department. A total of six radiation monitoring posts and associated PLGS radiation protection qualified teams will be established in the emergency department setting. These assets will be deployed with the pre-positioning of the NB EMO Field Command Post and confirmed once in place by the NB Power’s Point Lepreau Off-site EOC. The SJRH nuclear medicine department personnel will be available to assist PLGS Radiation protection qualified staff in providing radiation safety support within the hospital during a nuclear emergency.

4.3 Dose Limits

Radiation exposure of emergency workers will be monitored as described above in Section 4.2, and kept to a minimum as detailed in Section 4.4 below. Assignment of duties will ensure that no emergency worker receives a radiation exposure greater than that specified in Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards (Requirement 11, Sections 5.49 to 5.59)\textsuperscript{14}. The exposure of any worker shall not exceed an effective dose of 20 mSv per year averaged over five consecutive years, and shall not exceed 50mSv in any single year. A worker may voluntarily exceed the maximum single year dose limit of 50mSv if undertaking lifesaving actions; every effort shall be made to keep doses below ten times the maximum single year dose limit (500mSv) and only when the benefits to others clearly outweigh their own risk. Emergency workers will be trained in the use of personal protective equipment for radiation contamination and proper donning and doffing procedures. Because of fetal sensitivity

to radiation, pregnant staff will not be assigned to contaminated patients or evacuees. Any helpers, members of the public who are aware of the risks and voluntarily help during a nuclear emergency shall not be allowed to take actions that could result in their receiving doses in excess of an effective dose of 50 mSv (IAEA, 2015).

4.4 Reduction of Exposure

Protection from radiation can be achieved by managing the four factors of time, distance, shielding and quantity.

- **Time.** The shorter the time exposed to radiation, the less will be accumulated. If patient contamination is severe, a rotating team approach should be adopted to keep individual health care worker exposure to a minimum.

- **Distance.** The further from the radiation source, the lower the dose. Exposure is reduced as an inverse square: in other words, doubling the distance reduces exposure by a factor of four. Those not involved in immediate care of a contaminated patient should remain as far away as possible. Those removing contaminated material from the patient should use long-handled forceps.

- **Shielding.** The principles of shielding are similar to standard epidemiological “universal precautions” of gloving, gowning, masking and other protective barriers, along with careful waste management and limitation of the time exposed to contamination. Standard hospital clothing such as uniforms, surgical clothing and masks, gowns, latex gloves, etc., provide adequate protection against radioactive contamination if used in conjunction with managing time, distance and quantity. For further details on personal protective equipment see Section 4.5 below.

- **Quantity.** Exposure rate is directly related to the amount of radioactive material. Any technique that reduces the amount of material in the treatment area is desirable.

4.5 Personal Protective Equipment

Personal protective equipment (PPE) is recommended as a form of shielding for all first receivers, first responders and emergency workers, as described above in Section 4.4. A first receiver is defined as a health care worker in a hospital or other facility where casualties are arriving for treatment, not in proximity to the nuclear site. An emergency worker could be a first responder but could also be any person having specified duties as a worker in response to an emergency. The purpose of PPE is to protect workers from secondary contamination which can occur from handling a contaminated casualty or working in a contaminated environment. These areas will be defined and boundaries will be set by an NB Power health physicist or PLGS radiation protection qualified staff, which will be available, on-site to monitor safety and compliance. Movement between areas will be restricted and require removal and proper disposal of PPE. PPE will include gowns or coveralls, safety goggles or face shields, boot covers, surgical gloves, and an N95 respirator.
Box 3: Personal Decontamination Factsheet for Individuals Requiring Medical Treatment

Aim
The aim of personal decontamination is to remove as much radioactive material as practicable in order to reduce the surface dose and prevent contaminant from entering the body. Careful skin decontamination can also enhance the accuracy of whole-body counting for estimation of internal body burdens.

Preliminary Considerations
Treatment of traumatic injuries takes precedence over decontamination. Those doing the decontamination should strive to keep their own exposure and contamination to levels “as low as reasonably achievable” (ALARA) by monitoring radiation and managing time, distance, shielding and quantity of exposure. There are three steps to decontamination: Survey, Clothing Removal and Cleansing.

Steps To Decontamination

1. Survey
Survey should be conducted by trained personnel using consistent technique. Exceptionally large amounts of surface or embedded radioactive material should be noted. A complete record of location and level of contamination must be kept.

2. Clothing Removal
In most cases, removal of the patient's clothing and shoes will remove most contamination. Careful cutting and rolling clothing away from the face can help to contain contamination. Collect and segregate all clothing and contaminated materials, place in plastic bags, and then label and store them in a secure area for subsequent monitoring and disposal.

3. Cleansing
- Decontamination should be undertaken from the area of highest contamination (if known) to the lowest. Except when urgent wound care is required, decontamination is performed in the following order:
  - head, face, and hands (to avoid internal contamination);
  - wounds and adjacent skin; and
  - other skin areas.
- Radioactive objects should be removed using long-handled forceps and stored in lead containers.
- Over-aggressive skin decontamination must be avoided since it may injure the natural barriers in the skin and allow absorption through the skin.
- Use warm (not hot or cold) water. Hot water could open the pores and allow ingress, while cold water could close the pores and make contamination more difficult to remove.
- For intact skin, dry decontamination methods (e.g., adhesive tapes to strip removable particulate matter) may be used. Liquid decontaminants (detergents or other mild chemical agents) are also suitable but may not be appropriate for wound cleansing or irrigation of body orifices.
- If possible, swabs should be taken from nostrils, ears, mouth and other orifices and segregated for later measurement of radioactivity. If inhalation is suspected, nose blow and cough samples should be collected.
- Decontamination must be thorough to prevent transfer of contamination to people and to other areas of the facility.

Sources
Patient Decontamination Recommendations for Hospitals. Hospital and Healthcare System Disaster Interest Group and the California Emergency Medical Services Authority. July 2005
Principles of Patient Decontamination. Appendix H to Atomic Energy Control Board publication GMA-3.
5. OFF-SITE EMERGENCY CONCEPT

5.1 Overview

5.1.1 Emergency Planning Zones

For purposes of nuclear emergency preparedness and planning, the New Brunswick Annex, Federal Nuclear Emergency Plan has established two emergency planning zones (EPZ) around the PLGS. Figure 5 depicts these two planning zones in the context of the main highway where traffic control points will be established and MDCs established. The supporting medical facility and reception centres are depicted on both the East and West sides.

- **Plume Exposure EPZ.** A 20 kilometre radius circle around the station includes portions of the Musquash, Maces Bay, Lepreau and New River Beach-Pennfield areas, and extends seaward into Bay of Fundy. Planning and preparation for this zone includes ensuring that appropriate measures against exposure to a radioactive plume (such as sheltering-in-place or evacuation) can be applied in a timely and

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15 LEGEND: TCP = Traffic Control Point; SJRH = Saint John Regional Hospital
accurate manner. For planning purposes, the Plume Exposure EPZ contains approximately 3000-5000 individuals, including 20 to 40 clients of the Extra-Mural Program and one licensed Special Care Home with ten beds and zero nursing homes.

- **Ingestion Exposure EPZ.** An 80 kilometre radius circle around the station includes the City of Saint John and parts of Nova Scotia, as well as parts of the State of Maine in the United States. Its purpose is to enable planning and preparation for measures against exposure from ingestion of radioactive material.

These terms will be used throughout the document for any area referring to planning however any references to the actual area being evacuated during a response will be referred to throughout this document as the emergency evacuation zone. The emergency evacuation zone is made up of individual areas of responsibility referred to as Warden Zones. The actual emergency evacuation zone will be defined at the time of the emergency based on real-time information and measured levels of radioactivity; it could change during the response to adapt to the actual plume of radioactive material, as the situation unfolds.

5.1.2 **Health System Functions**

Responsibilities for health nuclear emergency management in an off-site emergency are assigned to the DH, Horizon Health and ANB in the *Provincial Health Nuclear Emergency Plan for the Point Lepreau Generating Station*. Detailed plans for carrying out those responsibilities are produced by individual health care partners and included in their organization-level plans.

5.2 **Shelter-in-Place**

5.2.1 **Overview**

In the event of a nuclear incident at PLGS requiring activation of the *Point Lepreau Nuclear Off-Site Emergency Plan*, there is a possibility that residents of the emergency evacuation zone may be required to evacuate, either as a precautionary measure or as a result of release of radioactive materials. Alternatively, the provincial Nuclear Control Group may order shelter-in-place rather than evacuation. In either case, subsequent decontamination of people, animals, vehicles and property may become a requirement.

5.2.2 **Health Services Responsibilities**

The decision to shelter-in-place will be made on recommendation by the Technical Advisory Group using Health Canada’s guidelines for interventions based on the ambient dose rate in the plume as well as in consideration of:

- health and safety risk;
- the dissipation rate of the plume versus the inherent disruption of an evacuation;
- the risk of exposure during evacuation.

If the decision is made to shelter-in-place, three challenges must be addressed by the health system. First, there may be a requirement to respond to medical emergencies in the sheltering area, and special needs may still have to be addressed. Second, there may be issues of decontamination and post-event public advice, counseling and medical follow-up to address. Third, timely and accurate health information must be provided continuously by all appropriate means.
5.3 Evacuation

5.3.1. Overview
The lead agency for an evacuation is the Department of Justice and Public Safety. Conduct of operations is a Royal Canadian Mounted Police (RCMP) responsibility under guidance of the provincial Nuclear Control Group. Health aspects are the responsibility of the DH, in cooperation with the Department of Social Development and other relevant provincial government departments as defined in Part 1 of the *Point Lepreau Nuclear Off-Site Emergency Plan*. Essential operational information for evacuation is provided in Part 2 of the *Point Lepreau Nuclear Off-Site Emergency Plan* and that information is reflected in the detailed plans of the health system partners.

5.3.2 Evacuation - Concept of Operations
In general terms, the *Point Lepreau Nuclear Off-Site Emergency Plan* states that the St. George RCMP detachment (District 1) will establish traffic control points to direct movement in and out of the emergency evacuation zone (see Figure 5). An evacuation may be precautionary before the release of radiation, or as a result of a release of radiation. Depending on the circumstances, evacuees may be directed to a Radiation Monitoring Post to be checked for possible contamination (see Section 5.4.1). Contaminated individuals will be taken to an MDC (see Section 5.4.2). Uncontaminated individuals will be bussed to a reception centre established by the Red Cross/Department of Social Development and directed to register, as detailed in section 5.5 and in Part 2 of the provincial *Point Lepreau Nuclear Off-Site Emergency Plan*. After registration, evacuees have the option of being accommodated at a reception centre or making their own arrangements. In addition, marine control centres and monitoring sites may be established at Saint John and Black’s Harbour.

5.3.3 Health Services Responsibilities
The decision to evacuate will be made on recommendation by the Technical Advisory Group using Health Canada’s guidelines for interventions as well as in consideration of:

- health and safety risk;
- the dissipation rate of the plume versus the inherent disruption of an evacuation;
- the risk of exposure during evacuation.

If the decision is made to evacuate, two challenges must be addressed by the health system. First, there may be a requirement to respond to medical emergencies in the emergency evacuation zone and second, special needs may still have to be addressed.

- **Ambulance NB.** An ambulance unit may be required to enter the emergency evacuation zone for emergency treatment and transport. Once an ambulance has been contaminated, it will be used only for transportation within contaminated areas. ANB will continue to respond to normal patient requests in and around the Point Lepreau area.

- **Extra-Mural Program.** The Extra-Mural Program will assess the needs of their clients' in the emergency evacuation zone and identify those clients requiring transportation assistance. For those requiring assistance, transportation will be coordinated with NB EMO through the Provincial EOC.
5.4 Monitoring and Decontamination

5.4.1 Radiation Monitoring Posts

If a release of radioactive materials takes place, or is likely to take place, before evacuation of the emergency evacuation zone can be completed, Radiation Monitoring Posts will be activated in accordance with the Point Lepreau Nuclear Off-Site Emergency Plan. The purpose of radiation monitoring is to ensure that all persons are checked for radiation contamination. Anyone who is not contaminated should be directed to a reception centre for registration. Contaminated individuals will be directed to an MDC (Section 5.4.2). It is essential that decontamination always precede the registration process. If an individual refuses radiation screening or decontamination, then quarantining may be necessary to protect the health of the public (see Section 9).

5.4.2 Monitoring and Decontamination Centres (MDCs)

Unless circumstances require otherwise, MDCs will be established on both sides of Highway 1, beyond the emergency evacuation zone, by the Department of Justice and Public Safety, Office of the Fire Marshal, with support from fire departments and Provincial Hazmat resources as necessary.

Disposal sites for contaminated material will be established in accordance with the Point Lepreau Nuclear Off-Site Emergency Plan. Everyone who is successfully decontaminated by the first or second shower will be directed to the buses which will transport them to a reception centre. Anyone who is still contaminated following the second shower will be sent by non-emergency transportation to the SJRH for further care. Those who fail decontamination at the westerly MDC and require non-urgent transport to hospital will go to the SJRH via transportation coordinated by NB EMO. For a schematic of the concept of operations see Figure 6.

5.4.3 Monitoring and Decontamination Process

Initial triage of evacuees will be followed by a more intensive monitoring both before decontamination, after removal of clothing and after decontamination. This initial screening and segregation of contaminated individuals is important to limit spread and cross-contamination of radioactivity. Provided there is no physical contact, contaminated evacuees are unlikely to present a major radiation hazard to emergency workers or other evacuees. Decontamination of individuals will follow the principles described in Section 3.2.

5.4.4 Radiation Status Identification System (Wrist Bands)

A system of colored wrist bands will be used to identify evacuees who have been assessed for radiation and distinguish those who are free of contamination from those who are contaminated. This system will be required in the field setting however it will also be useful in the Emergency Department setting, to quickly identify individuals as an evacuee from the emergency evacuation zone who has been assessed and provides information on their contamination status.

All evacuees will be assessed for radiation contamination. Those who are not contaminated receive a white wrist band. Those who are contaminated will proceed through the decontamination line and will be reassessed post-decontamination. If the evacuee successfully completes the decontamination process, a white wrist band will be applied. If an evacuee fails decontamination after two attempts or if he/she must be transported by ambulance for urgent medical care before decontamination, an orange wrist band will be applied.
An evacuee with a permanent radioactive implant as part of a medical procedure will fail decontamination; there is no way to pinpoint whether the detectable radiation is from the implant or due to failed decontamination therefore these evacuees will receive an orange wrist band and be transported to hospital for further assessment.

5.4.5 Waste Management

The management of radiation contaminated waste is the responsibility of PLGS.

5.4.6 Health Services Responsibilities

Upon notification of MDC activation, implicated Nuclear Control Group members will request the deployment of personnel to the MDC assembly area identified by NB EMO, on the East and West sides of the emergency evacuation zone. The Health member of the Nuclear Control Group will notify the NBHEOC to trigger the deployment of health personnel. Health staff from Horizon Health, ANB, and the DH OCMOH Public Health will be notified to deploy through their respective EOC linkages, one hour prior the MDCs being open to evacuees.

It should be noted that health system personnel are implicated in the MDCs only where the public is implicated. If the MDCs are activated for PLGS and emergency workers only, in a scenario where evacuation is successfully completed prior to any release of radioactive material, the field roles for the health system will not be required. In this type of scenario, ANB would be available by request.

The following roles and responsibilities for the health system are intended for a mass monitoring and decontamination scenario.

- **Emergency Medical Services.** In the event of a release of radiation, ANB will withdraw their position to just outside of the MDCs and perform the following functions:
  a. Pre-decontamination triage - Ambulance NB will provide paramedics in the pre-decontamination area to prioritize evacuees for decontamination based on existing medical conditions or other limitations. Personal protective equipment will be required in this setting. As communication between paramedics and evacuees will be hampered by wearing the required N95 respirators, NB EMO will provide placards for communicating process information, to decrease process-related questions.

  Facilitation of radio consultations with mental health and/or public health positioned in the post-decontamination area with evacuees in the queue for decontamination - a job action sheet will be provided to paramedics working in this area to guide them in making referrals to public health and mental health resources positioned in the post-decontamination area and facilitating a radio consultation between these resources and evacuee requiring immediate intervention, before decontamination is possible.

  b. Post-decontamination medical assessment of evacuees who self-present or are referred by Red Cross for medical care.

  c. Provide treatment and emergency transport, as required, potentially in the Emergency Evacuation Zone or either MDC. If an ambulance unit is required to enter the MDC for emergency treatment and transport, NB EMO will ensure an
area is cleared to allow access to the patient and to radiation monitoring. Once an ambulance has been contaminated, it will be used only for transportation within contaminated areas.

d. Assign an NB Emergency Medical Services (EMS) Manager to provide coordination to field staff through both MDC Command Posts.

- **Public Health Information.** Some waiting time can be anticipated in the pre-decontamination area, as evacuees stand in line for decontamination. Waiting time can also be anticipated as evacuees wait to board the buses to reception centres. Regional Public Health staff trained in the health effects of radiation and equipped with print material and resource lists will be available in the post-decontamination area alongside mental health services (also positioned in the post-decontamination area). They will be able to provide information, answer questions related to radiation and health, and make referrals to appropriate services. This service will be a mitigation measure to ease some of the potential burden of the “worried well”.

RHA Public Health Staff will also be available remotely to those in the pre-decontamination area through paramedics responsible for triaging evacuees in the queue for decontamination. As described above under 'Emergency Medical Services', paramedics will be equipped with radios and can facilitate radio consultation with public health and/or mental health personnel in the post-decontamination area, if an evacuee is identified as requiring immediate intervention. Personal Protective Equipment will not be required by those working in the post-decontamination area.

**Mobile Mental Health Services.** Mobile Mental Health Services will provide psychosocial support in the field setting. They will be available alongside Regional Public Health staff, in the post-decontamination area before evacuees board buses. A shelter will be provided in the post-decontamination area for interventions or consultations requiring a quiet, private space. Staff will have *Communities in Crisis* training as well as an understanding of the health effects of radiation. As for Regional Public Health staff described above under the ‘Public Health Information’ section, mental health personnel in the post-decontamination area will be made available for consultation remotely via radio, for any evacuee identified by paramedics as requiring immediate intervention. Mental health personnel will flag any evacuee who requires follow up at one of the reception centres, where they can be referred to on-site mental health services. Personal Protective Equipment will not be required by those working in the post-decontamination area.

Critical Incident Stress Management (CISM) teams will be available for deployment upon request for first responders and emergency workers.

- **Decontamination Assistance to the Medically Vulnerable.** There will be three decontamination lines: male, female and one for those requiring assistance. Horizon Health staff will assist the medically vulnerable population as required, with personal care throughout the process of decontamination. Waterproof personal protective equipment will be required in this setting.
5.5 Reception Centres

Establishing and operating reception centres is the responsibility of the Red Cross / Department of Social Development. Locations in Saint John, Sussex and St. Stephen are defined in the *Point Lepreau Nuclear Off-Site Emergency Plan*.

Upon notification of an evacuation order by the Provincial EOC, Red Cross will deploy teams to set up reception centres. With the deployment of Red Cross teams, the Red Cross Nuclear Control Group member will request the deployment of implicated personnel to reception centres. The Health member of the Nuclear Control Group will notify the NBHEOC to trigger the deployment of health personnel. Health staff from Horizon Health, ANB, and the DH Public Health will be notified to deploy to Reception Centres, through their respective EOC linkages, and report for duty one hour prior to the opening of the centre to evacuees.

All uncontaminated and decontaminated evacuees from MDCs will be directed to a reception centre for registration before being allowed to proceed independently, if they do not require any of the emergency social services offered. The Red Cross will provide registration services. For evacuees with no alternative accommodation, the Department of Social Development will establish reception centres in accordance with the provincial *Point Lepreau Nuclear Off-Site Emergency Plan*.

The following sections summarize reception centre responsibilities, specific to the health system responsibilities.

5.5.1 Emergency Medical Services

ANB will provide paramedics on-site for the first 24 to 48 hours at primary and secondary sites (as necessary), to provide reassurance to evacuees as they arrive, and assist those who require first aid, treatment and/or emergency transport. After the initial 24 to 48 hours, coverage will be provided through the NB-911 system.

5.5.2 Mobile Mental Health Services

Horizon Health Communities in Crisis services teams will provide psychological first aid and crisis management briefings to evacuees at reception centres.

5.5.3 Extra-Mural Program

Horizon Health Extra-mural Program will provide continuity of care for displaced clients in or outside of reception centres. Extra-mural Program staff will also assess evacuees with health care needs, as requested and within their scope of practice, to determine if they can be supported through Extra-mural Program service providers. New clients may be referred to the Extra-mural Program by ANB paramedics on-site at reception centres.
Figure 6. Off-site Emergency Response Concept of Operations

Legend: TCP = Traffic Control Point; HWY = Highway (Highway 1); PH = Public Health; HCW = health care worker; EMP = Extra-Mural Program; MH = Mental Health; ANB = Ambulance NB; Hot Zone/Warm Zone/Cold Zone = see Part IV, Section 16 - Glossary for definitions.
5.5.4 **Public Health**

The DH Health Protection Branch will conduct health and hygiene inspection of reception centre sites through Public Health Inspectors prior to opening and monitor the facility, as required. Signage will be posted at reception centres with relevant public health guidance related to smoking, handwashing, food safety and other public health preventative measures.

Print information in the form of a brochure on radiation and health, will be provided through NB EMO on behalf of the Office of the Chief Medical Officer of Health and distributed by the Horizon Health Red Cross Control Centre Lead, to Red Cross workers and health system workers on-site at reception centres. This print information can be distributed to evacuees and/or used by staff at reception centres for answering questions on the health effects of radiation.

5.5.5 **Access to Prescription Medication, Outpatient Appointments and Rehabilitative Equipment**

Residents of the 20km evacuation planning zone around PLGS have been educated through PLGS and the NB EMO to bring prescription medications with them in the event of an evacuation order. It is acknowledged however that evacuees may not always remember to bring prescriptions and may not even be home at the time of the evacuation order. The Red Cross logistics department will work with Regional EOCs to access municipalities and coordinate transportation for evacuees to access medications and medical appointments. Red Cross may also work with pharmacies and local taxi services to have prescription medications delivered. Red Cross will assess evacuee requirements for medical devices or aids and coordinate procurement. On the east side of the emergency evacuation zone, Red Cross has these resources available. On the west side of the emergency evacuation zone, these resources will be procured from Fredericton.

5.5.6 **Red Cross Control Centres**

A Canadian Red Cross Control Centre will be established at each reception centre. A Red Cross Site Manager will be assigned to each primary site (UNB Saint John and Fundy High School) to provide oversight and he/she may also have responsibility for secondary sites (River Cross Church and St. Stephen High School). The Site Manager will be a dedicated position in charge of managing operations, communicating with external agencies, local authorities, Regional EOCs and the PEOC. They are in charge of the site, ensuring resource, logistic and equipment needs are met. They are responsible for security, administration, information technology, security and health and safety for organizations and agencies on-site. Organizations and agencies report to the Site Manager upon arrival to the reception centre, to be assigned to their designated area however each organization or agency retains responsibility and authority for their own roles within reception centres. Site Managers will establish a daily schedule for situation briefings and information will flow to and from Regional EOCs, and the PEOC via their Red Cross members.

Each health organization will assign a lead while they are on-site and report to the Control Centre, to ensure a liaison function within the Red Cross Control Centre. Health system organizational leads are not necessarily dedicated positions i.e. the roles may be assigned to individuals fulfilling a specific Health role in the reception centre. Red Cross Control Centre responsibilities for the health system at receptions centres are as summarized below.
• Health system organizational leads assigned by ANB, Horizon Health and the DH (Health Protection Branch) will, relevant to his/her organization:
  o facilitate logistical, health / medical and other support and assistance for on-site personnel, by reaching back to their respective EOCs;
  o facilitate delivery of on-site health services;
  o brief and ensure corporate EOC has current information on the on-site response;
  o serve a liaison function between the Site Manager and on-site personnel as well as between corporate EOC and on-site personnel (see Figure 7 - Operational Communication, below).

• Health system organizational leads will participate in Red Cross Control Centre briefings led by the Red Cross Site Manager, 2 to 3 times daily;
• Health system organizational leads report to their respective organizational EOCs.
• Horizon Health Control Centre lead will pre-position public health brochures in reception centres and ensure health personnel on-site as well as Red Cross registration tables maintain a supply.

Operational Communications between Emergency Operations Centres and the Canadian Red Cross Control Centres is depicted below:

Figure 7. Operational Communications - Canadian Red Cross Control Centre
5.6 Management of the Worried-Well and those Bypassing Monitoring and Decontamination Centres

The anticipated numbers of ‘worried-well’ and evacuees who bypass the MDCs have the potential to overwhelm hospital emergency departments. The use of emergency departments’ resources need to be optimized for providing timely service to casualties of the emergency and to the community at large, who require medical assessment and treatment. To prevent a surge in demand from the ‘worried-well’ and evacuees who bypass the MDCs (requiring radiation screening and potentially decontamination), a process will be implemented at strategic locations to control access to hospital emergency departments.

5.6.1 Saint John Regional Hospital (SJRH) and Charlotte County Hospital (CCH)

Checkpoints will be established for redirecting unnecessary traffic away from hospital emergency departments. The first checkpoint, Checkpoint #1, will be established at or near the entry to a primary access route to the hospital by City Police or RCMP and serve as a traffic control point. Evacuees who bypassed MDCs and those reporting their intention to go to the hospital emergency department will be flagged for further screening by Horizon Health personnel to determine their need for medical assessment/treatment at the hospital emergency department. Police will allow any traffic with intended destinations other than the hospital to continue to their destination. Police will also allow ambulances, hospital staff, hospital volunteers, visitors or clients of ambulatory clinics, to continue to the hospital. There are four possible outcomes to the Checkpoint #1 screening process:

1. Those who have not been in the emergency evacuation zone who require medical assessment/treatment will be allowed to proceed via an established thoroughfare to the hospital emergency department, without stopping at any further checkpoints;
2. Evacuees who bypassed the MDCs and do not require medical assessment/treatment will be asked to proceed to the second checkpoint;
3. Those who have not been in the emergency evacuation zone and are assessed as not requiring medical assessment/treatment will be redirected to an alternate location away from the hospital, where they will receive reassurance monitoring, information on radiation and health, as well as a list of community resources for accessing further information and services;
4. Evacuees stopped at the first SJRH checkpoint only, who bypassed the MDCs and require medical assessment/treatment, will be asked to park their cars in a designated area and will be shuttled by NB EMO coordinated transportation to the SJRH emergency department for radiation screening, medical assessment/treatment, and potentially decontamination.
5. Evacuees stopped at the first CCH checkpoint only, who bypassed MDCs will be asked to park their cars in a designated area and will be shuttled by NB EMO coordinated transportation.

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16 There will only be one access route available to the hospital emergency department. Secondary access roads will be secured and barricaded by hospital security personnel.
17 During a General Radiation Emergency, as classified by PLGS, the RCMP will oversee operational command of provincial police forces.
18 Police will determine at this checkpoint: (1) what is the intended destination; (2) if they are going to hospital, for what purpose, and; (3) determine if they have been in the emergency evacuation zone during at the time of a PLGS General Radiation Emergency classification.
19 An alternate location within the community, away from hospital emergency departments, will be set up through the relevant NB EMO Regional Emergency Operations Centre. The worried-well will be redirected to this location for ‘reassurance’ radiation monitoring and to access information. Horizon Health mental health resources will be on standby and may be deployed on request to provide psychological first aid.
transportation to the SJRH hospital emergency department for radiation screening, medical assessment/treatment, and potentially decontamination, as CCH is not a designated treatment centre for contaminated casualties; SJRH is the only designated hospital in NB for receiving contaminated casualties.

A second check point, Checkpoint #2, will be established by City Police or RCMP and serve as a traffic control point to redirect those flagged by the first checkpoint:

1. Evacuees who bypassed the MDCs will be directed to a designated parking area where they will be asked to park their cars and proceed to a radiation monitoring post. A Point Lepreau Generating Station (PLGS) radiation protection qualified staff will screen each evacuee for radiation contamination. Those who screen positive for radiation will be shuttled to the closest MDC where they will go through the decontamination process. Once successfully decontaminated, they will travel by NB EMO coordinated transportation to the closest Red Cross Reception Centre, as for other evacuees at MDCs. The PLGS radiation protection qualified staff will provide contaminated evacuees with a briefing and rationale on the process as well as an information pamphlet, to address questions and concerns before asking them to board the shuttle to the MDC.

2. All other traffic will be allowed to proceed to their destinations via an established thoroughfare, as directed in Checkpoint #1.

For a schematic illustrating the process for the SJRH, refer to Figure 8.

5.6.2 St Joseph’s Hospital

A secure checkpoint will be established by City Police at a designated entrance to the St Joseph’s Hospital Emergency Department. Anyone arriving at the designated entrance will be screened and those flagged as evacuees who bypassed MDCs and/or those reporting their intention to go to the hospital emergency department will be further screened by Horizon Health personnel to determine their need for emergency medical assessment/treatment at the hospital emergency department. Police will allow hospital staff, visitors or others not associated with the emergency, to continue to the hospital through the checkpoint. There are four possible outcomes to this screening process:

1. Any evacuees who bypassed the MDC and do not require medical assessment/treatment, will be shuttled to the SJRH checkpoint system;

2. Evacuees who bypassed the MDCs but require urgent/emergent medical assessment/treatment will be sent to the hospital emergency department via ANB.

3. Those who have not been in the emergency evacuation zone and are assessed as not requiring medical assessment/treatment (i.e. the ‘worried-well’) will be redirected to an alternate location away from the hospital by shuttle (arranged by NB EMO), where they will receive reassurance monitoring, information on radiation and health, as well as a list of community resources for accessing further information and services.

4. Those who have not been in the emergency evacuation zone who require medical assessment / treatment will be allowed to proceed to the hospital emergency department.
Figure 8. Management of the Worried Well at the SJRH
5.7 Pre-hospital and Hospital Services

5.7.1 Emergency Medical Services
Ambulance service to the community affected by an off-site emergency is governed by all-hazard standard operating procedures for emergencies; paramedics will take all precautions mandated by the hazard to ensure safety of themselves during response activities, with guidance from PLGS radiation protection qualified staff. ANB will continue to participate in emergency medical care activities inside the emergency evacuation zone during the evacuation of the community while safe to do so. When radiological contamination is above safe levels as determined by the Nuclear Control Group, ANB’s activities will withdraw to the outside of the emergency evacuation zone and standby for further requests. Entry back into the emergency evacuation zone after safe levels are exceeded will be for emergencies and while wearing NB EMO issued PPE.

5.7.2 NB Trauma Program
The NB Trauma Program provides Field Trauma Triage Guidelines to help ensure injured patients are transported directly to the facility best equipped to meet their immediate needs. Consideration must be given to the impact of the 20km emergency evacuation zone covering access to the SJRH through Highway 1 from the Charlotte County area.

In compliance with the NB Trauma Program Field Trauma Triage Guidelines, trauma cases qualifying for level 1, 2, or 3 care must be transported to the SJRH, as it is the closest Trauma Centre with a designation at or above level 3. As such, any contaminated casualty qualifying for level 1, 2, or 3 care from within the plume must be transported through to the East side, to the SJRH. Any casualty qualifying for level 1, 2, or 3 care and who are on the West of the plume, will be transported across the plume to the SJRH. This will apply whether the casualty is a contaminated evacuee from the MDC or a non-contaminated patient within the Charlotte County area. In traveling across Highway 1 travelling to the SJRH, the probability of receiving radiation exposure in excess of 50mSv, the annual dose limit for emergency workers, is low within plausible PLGS emergency scenarios. The provincial emergency response structure includes a Technical Assessment Group with membership from experts in radiation, health physics and public health. Real time field survey data will be available to the Technical Assessment Group for analysis; in the event that levels along Highway 1 exceed the prescribed dose limit for emergency workers, this will be communicated to RCMP at access control points on the easterly and westerly sides of the emergency evacuation zone. For further details refer to Section 11 – Emergency Medical Services.

5.7.3 Provincial Radiation Medical Advisor
The Provincial Radiation Medical Advisor’s role is to (1) provide a liaison with Health Canada and interpret real-time information from radiation experts; (2) to provide medical advice to the NBHEOC, the Saint John Regional Hospital Medical Lead, and (3) participate in the PEOC as a member of the Technical Advisory Group. This advisor ensures the consistency, integration and communication of clinical information and responds to policy-specific questions from Tele-Care 811. The Provincial Radiation Medical Advisor will also act as spokesperson regarding medical issues, working closely with the Chief Medical Officer of Health.
5.7.4 **Saint John Regional Hospital (SJRH)**

The SJRH is the designated facility for receiving contaminated casualties from a nuclear emergency at the Point Lepreau Generating Station. Every effort will be made to decontaminate casualties before transportation to hospital emergency departments, however as the treatment of life-threatening health conditions takes precedence over decontamination, the SJRH will be prepared to receive contaminated casualties where required. In addition to those with life-threatening medical conditions, the emergency department will also receive evacuees who have failed decontamination at an MDC after two attempts, for further assessment for internal contamination and treatment. PLGS radiation protection qualified staff (6) and associated equipment will be deployed with the first case on route to the SJRH or as soon as the pre-positioning of the MDC has been triggered, whichever is first. The NB Power representative in the Provincial EOC will confirm once these resources have been deployed and this will be communicated through the emergency response structure to the SJRH EOC. Response activities and decontamination of the treatment areas post-response will be conducted under the advice of PLGS radiation protection qualified staff.

- **Emergency Department Setting**

  In an event with off-site implications, the SJRH will be notified by the Horizon Health through the notification process outlined in the all-hazards health emergency management plans.

  **Triage and Initial Assessment**

  The emergency department at the SJRH is responsible for screening, triaging, assessing and treating evacuees from PLGS, the emergency evacuation zone and MDCs. The radiation assessment tool used in the METER training course by Health Canada will be adapted at the facility level to guide procedures from screening and triage through to treatment. The Radiation Casualty Assessment Tool (adapted from the Health Canada METER Course v2.3, 2011) will be used by a physician or Registered Nurse to assess patients presenting at the Emergency Department to establish initial priority. Triage will determine the patient’s level of stability, contamination status and history of exposure to radiation. It will establish initial priority, i.e. those requiring immediate treatment versus those who can be decontaminated prior to treatment.

  Patients requiring immediate treatment will be assumed contaminated and will be cohorted as such, unless they are wearing a white wrist band applied in the field at the radiation monitoring stations, indicating that they are not contaminated. Patients who are not already presenting with wrist bands indicating that they've been previously assessed in the field, will be assessed for contamination. The same wrist band system will be applied as in the field to identify a patient as contaminated or not contaminated (see Section 5.4.4). Patients will also be assessed for exposure to radiation.

  There may be patients who have had medical procedures or implants that are a source of radiation and despite decontamination, will fail radiation assessment. In some cases, patients can provide documentation indicating that they have had such a procedure or implant. This should be considered in the initial assessment.

  Pregnant women will be treated as any other contaminated patient, and then referred to an obstetrician as a high risk pregnancy, to be monitored throughout the duration of the pregnancy.
Decontamination
Decontamination procedures will be applied to the Emergency Department at the SJRH and will include protocols for decontamination and wound decontamination.

Secondary Assessment
The Radiation Assessment Tool includes a History and Physical Form. This form is intended to be completed by the treating physician and used to prompt the physician to obtain specifics relevant to treatment and disposition decisions unique to radiation exposure and/or contamination.

The Radiation Assessment Tool also includes a Body Mapping Form. This form is intended to be completed by the attending physician or a registered nurse to facilitate recording the location of any skin contamination and radiation-related injuries. Contaminated areas, injuries, burns or skin changes are recorded as observed by the person performing the survey. Initial counts and post-decontamination counts are recorded.

Specific laboratory tests and medications related to the treatment of radiation exposure and/or contamination can be recorded on the Physician’s Order section of the tool. There is also a decision-making tool included for allowing the attending physician to estimate the severity of the injury due to radiation exposure, when the dose has not been determined. This includes a list of decortorating agents for treating internal contamination.

• Hospital Settings other than the Emergency Department
Lifesaving interventions take priority over radiation and contamination concerns so contaminated patients may require interventions outside of the emergency department prior to decontamination. If diagnostic imaging or surgery is required, the SJRH supervisor or unit manager will provide advanced notice to these departments to allow time to prepare the area and staff. Personnel from PLGS will be on-site to monitor staff and patient contamination levels and assist with the decontamination of the treatment area.

• Medical Management
Lifesaving interventions take priority over decontamination and radiation-related concerns. Patients should be evaluated and treated based on current triage standards. There are many scenarios possible as a result of a nuclear emergency at PLGS; detailed medical management of radiation and contamination related injuries are outside the scope of this plan. For information on the medical management of radiation-related injury, the following resources are available:
Clinical Support
The attending physician of a contaminated or exposed patient can access radiation medical expertise at their discretion, through the Provincial Radiation Medical Advisor, as facilitated through the NBHEOC and Health member of the PEOC (Nuclear Control Group). A secondary resource for radiation expertise is available through the Health Canada Radiation Protection Branch, accessible through the SJRH EOC via a request to the NBHEOC. To ensure expedient access, an initial contact will be made through the NBHEOC to place the Health Canada Radiation Protection Branch on standby. If additional resources are needed beyond Health Canada, they will facilitate access to the US Radiation Emergency Assistance Centre/Training Site, which can provide access to an on-call 24 hours a day/seven days a week to offer expertise on managing the medical component of a radiation incident.

If isotope identification is required to support medical treatment, the implicated isotopes would be known to PLGS and could be communicated from the provincial Technical Assessment Group to the attending physician, by the Provincial Radiation Medical Advisor in consultation with the NB Power health physicist. If required, an NB Power health physicist will be on site at the SJRH with a portable spectrometer with the capability to identify isotopes.

Decorporating Agents
Decorporating agents can be made available within 24 hours of a request through the National Emergency Strategic Stockpile (refer to Section 6.1.3 for details). The decision to use a decorporating agent can be difficult as these agents have unfavourable risk-to-benefit ratios for low levels of internal contamination. The US Department of Health and Human Services, Radiation Emergency Medical Management Site contains useful guidelines for decision-making:
http://www.remm.nlm.gov/int_contamination.htm#blockingagents

- Laboratory
PLGS radiation protection qualified staff will be on-site in the emergency department at SJRH to assist medical personnel with dose assessment. All specimens from patients related to the nuclear emergency event requiring laboratory analysis will be labeled with radiation dose rate. As part of the assessment of casualties suspected to have been exposed to radiation, potentially contaminated samples will be sent to the laboratory for analysis. This may include blood samples, nasal swabs, mouth swabs, urine samples, stool samples or emesis samples. Any specimen with a dose rate exceeding 100 times background level will be flagged for the hospital laboratory for implementing special precautions. The laboratory will have a plan for receiving and processing potentially contaminated samples.

Cytogenetic analysis and other radiation expertise to support the SJRH laboratory will be accessible in real time through Health Canada’s Radiation Protection Bureau via the NBHEOC.

- Waste Management
Within the hospital setting, the management of waste will be outlined in the internal plan for SJRH and guided by PLGS radiation protection qualified staff. The SJRH decontamination system (located in the ambulance bay), has the capacity to
decontaminate 9 to 18 people before the cistern capturing waste water would need to be emptied. Given that measures have been put in place to redirect evacuees that bypass MDCs away from the hospital, the SJRH is not expected to require mass decontamination capability; as such, it is not expected that emptying the cistern capturing waste water from decontamination will be required during the response. In any case, waste water produced during decontamination will need to be captured and handled as hazardous material. In the event that decontamination capability must be suspended to properly dispose of cistern waste water, outage time will be minimized by having a waste water removal service on standby for rapid response and by temporarily capturing waste water in an alternate receptacle.

- **Facility Recovery**

Responsibilities and procedures specific to SJRH are detailed in its internal facility plans. In general, the decontamination objective for any health facility is to ensure that equipment and floors are at less than twice the normal background reading, although higher levels should not deter the use of emergency facilities during periods of critical need. Thorough cleaning routines are usually effective but if there is still residual contamination, some furniture, equipment or flooring may need to be replaced. Procedures must be in place, and practiced, to remove waste from the Emergency Department and triage area to a holding area where it can be surveyed for radioactive material before disposal.

5.7.5 **Other Facilities and Sites within the Evacuation-Affected Area**

Horizon Health facilities, sites and programs in the area surrounding PLGS between St. Stephen and Sussex may be called upon to provide the following services. Note that Horizon Health facilities on the Fundy Isles hold stockpiles of KI pills however with the exception of the designated hospital, those on the mainland do not.

- **Charlotte County Hospital (CCH), St Stephen.** Although every effort will be made to transport contaminated patients to the SJRH, it is possible for an evacuee waiting on the westerly MDC to unexpectedly require emergency transportation to the nearest emergency department. The CCH may have to stabilize a contaminated patient until transfer to the SJRH is possible. PLGS radiation protection qualified staff will be deployed upon notification of a contaminated casualty on route to the CCH.

- **St. Joseph’s Hospital, Saint John.** Preparedness to support the SJRH if the impact is exceeding SJRH capacity (e.g., provision of staff or administrative support, overflow facilities, etc.). Preparedness to support the plan for the management of the worried-well and those who bypass the MDCs (see Section 5.6.2).

- **Fundy Health Centre, Blacks Harbour.** Preparedness to advise or counsel drop-in queries from concerned people. Otherwise the facility should only be affected if the 80 kilometre ingestion exposure EPZ is activated.

- **Campobello Health Centre, Welshpool.** Preparedness to advise or counsel drop-in queries from concerned people. Issue pills from KI stockpile if instructed. It is possible that contaminated vessels may enter the harbour. Otherwise the facility should only be affected if the 80 kilometre ingestion exposure EPZ is activated.
• **Deer Island Health Centre, Fairhaven.** Preparedness to advise or counsel drop-in queries from concerned people. Issue pills from KI stockpile if instructed. It is possible that contaminated vessels may enter the harbour. Otherwise the facility should only be affected if the 80 kilometre ingestion exposure EPZ is activated.

• **Grand Manan Hospital.** Preparedness to advise or counsel drop-in queries from concerned people. Issue pills from KI stockpile if instructed. It is possible that contaminated vessels may enter the harbour. Otherwise the facility should only be affected if the 80 kilometre ingestion exposure EPZ is activated.

• **Other Facilities within the area surrounding PLGS.** SJRH will be supported by other Horizon Health staff and/or facilities if the impact is exceeding capacity.

### 5.7.6 Other Facilities and Sites beyond the Emergency Evacuation Zone

Horizon Health facilities and sites beyond the zone affected by evacuation operations have no designated health nuclear emergency responsibilities, but may be called upon by the Horizon Health / SJRH EOC to support affected Horizon Health facilities and sites (e.g., augmentation of staff, supplies, etc.). These are:

- **Sussex Health Centre; and**
- **Extra-Mural Program (EMP) Units** (*Sussex and Kennebecasis Valley Unit, Quispamsis*).

### 5.7.7 Extra-Mural Program

- **EMP in Community Settings**

  The EMP will provide service to all of its displaced clients and any new clients resulting from the emergency event in alternate accommodations (e.g. hotels, friends or families’ homes). Roles of the closest EMP Units are as follows:

  - Eastern Charlotte Office, St. George. Support to displaced patients at reception centres. Ensuring continuity of care and preparedness to advise or counsel drop-in queries from concerned people.
  - St. Stephen Unit. Ensuring continuity of care. Preparedness to advise or counsel drop-in queries from concerned people.
  - Saint John Unit. Ensuring continuity of care. Preparedness to advise or counsel drop-in queries from concerned people.

### 5.7.8 Supplies and Equipment

A dedicated supply cabinet reserved for use in a nuclear emergency is maintained at the SJRH by the PLGS and contains supplies such as PPE, dosimeters, waste management supplies, self-decontamination kits, KI pills, and wrist bands for identifying contaminated versus decontaminated or non-contaminated patients.

For the field setting, most supplies and equipment such as PPE and dosimeters will be provided by NB EMO and PLGS. For health care workers, N95 respirators from the Provincial Emergency Stockpile are pre-positioned with NB EMO supplies and will remain under their custodianship as for use at the MDCs. Other supplies required include information brochures published by
OCMOH, any tools required to triage and provide personal care assistance. OCMOH brochures will be provided by the DH and remain under the custodianship of NB EMO with other supplies required for the MDCs, in preparation for an emergency event. These brochures will be pre-positioned at the MDCs by NB EMO and distributed to health personnel in the post-decontamination areas as well as at Red Cross MDC registration tables by the Horizon Health Services Coordinator, who will also ensure the supply is maintained during the event. As per section 5.5, Horizon Health Coordinator for reception centres will bring a supply of brochures to each centre and ensure a supply is maintained for use and distribution by Horizon Health personnel and at Red Cross reception desk. The National Emergency Stockpile System and Provincial Emergency Stockpile may be accessed if required through the NBHEOC (see Section 6.1.2 and 6.1.3).

5.7.9 Organizational Development

Horizon Health’s Organizational Development will support the services within Horizon Health that provide direct patient care during a nuclear emergency. Its focus will remain on Human Resources Advisory Services, Library Services, Occupational Health and Safety Services and Learning Services.

During a nuclear emergency, Organizational Development will communicate with unions and professional groups regarding the event, managed and directed by the Director of Labour and Employee Relations and/or delegated to the Horizon Health (Saint John Area) Senior Human Resources Advisor. Organizational Development’s nuclear preparedness activities include the following responsibilities.

- Develop learning strategies in support of, and based on, direction from content owners and subject matter experts so that employees are appropriately trained to treat victims of a nuclear accident.
- Provide occupational health and safety leadership to Horizon Health including direction on personal protective equipment and decontamination.
- Develop an occupational health response plan outlining the role of Horizon’s Health and Safety Officer.

5.8 Tele-Care 811

Tele-Care 811 must be prepared to respond quickly to individual queries on instructions on food, air and water safety, sources and advice on KI pill administration, and advice and information on care. Coordination between OCMOH and Tele-Care is therefore required to ensure Public Health approval of information and protocols before they are provided by Tele-Care to the public. This will be done as part of wider coordination requirement with other partners as described in Section 13.

5.8.1 Tele-Care 811 Information Requirements

In order for Tele-Care 811 to be in a state of readiness to fulfill all roles, all information requirements from contributing partners must be met on a real time basis.

- up-to-date public messaging;
- a list of frequently asked questions and answers on the health effects of radiation;
- up-to-date information on services changes within the Health Networks;
• clinical support to ensure Tele-Care symptom triage protocols are aligned with current clinical information; and
• contact information from outside partners providing referral services.

Tele-Care 811 will be activated immediately after NBHEOC activation with pre-scripted and pre-approved information.

5.9 Public Health – General Responsibilities

5.9.1 Office of the Chief Medical Officer of Health (OCMOH)

In addition to specific roles in MDCs and in the inspection of reception centres, OCMOH in response to a nuclear emergency will provide recommendations and guidance in four main areas: air quality; water quality; food quality; public health guidance. The following is a description of specific items.

• **Air quality**
  o Assist with health risk assessments related to human health as required.
  o Provide Public Health Advisories regarding air quality through the emergency communications organization, as well as through the Public Health Advisories page on the OCMOH website.

• **Food Quality**
  o Assist with health risk assessments related to human health as required.
  o Provide public health advice with regard to the contamination of foods, their condemnation, embargo and disposal if required.
  o Provide public health advice regarding food related matters in the event of a power outage.
  o Inspect community centers used for temporary accommodations to ensure adequate food safety, water quality, washroom requirements and general sanitation.

• **Water and Soil Quality**
  o Assist with health risk assessments related to human health as required.
  o In conjunction with the Department of the Environment and Local Government, provide consultation and advice to local municipalities where a municipal water supply may be or has been affected.
  o Provide public health advice on what to do if water or soil contamination exceeds health guidelines.

• **Public Health Guidance**
  o Provide public health advice to the population and relevant stakeholders.
  o Provide advice to government departments on public health impacts.
  o Provide public health guidance to the representatives of response organizations as requested.
o Provide advice to the Provincial Nuclear Control Group on all public health matters.

o The Saint John Region Medical Officer of Health will review requests from the PEOC regarding the distribution of KI pills, issue a KI Advisory as required and provide recommendations on the appropriate dosages.

o Provide a printed information brochure published by the OCMOH as a resource to support Horizon Mental Health Services and Regional Public Health field roles, for distribution at reception centres.

o Provide public health messaging to NB EMO Communications and Health Communications such that they may:
  - ensure that the web site is updated daily with public health and safe zone information;
  - ensure that Tele-Care 811 receives public health information in advance of being reported to the public;
  - ensure the public receives pertinent public health information in a timely manner to prevent adverse health effects related to the event; and
  - respond to all media calls transferred from Tele-Care within 24 hours.

5.9.2 Regional Health Authorities – Public Health

The relationship between Horizon Health, Vitalité Health and Public Health staff is already defined and there are no unique considerations for a nuclear emergency.

5.10 Community Psychosocial Services

In addition to responsibilities specific to the MDCs, reception centres and worried-well concept previously described (Sections 5.4, 5.5, and 5.6), Addictions and Mental Health Centres within Horizon Health (Saint John Area) may be called upon in the event of a nuclear emergency, to provide psychosocial assistance to individuals, families, caregivers as well as Critical Incident Stress Management services to assist first receivers and first responders who have experienced emotional and psychological stress related to the event.

None of Horizon Health’s Addictions and Mental Health Centres or satellite clinics are within the 20 km emergency evacuation zone around the PLGS, although all are within the Ingestion Exposure EPZ (See Section 5.1.1). Centre staff may also be required to assist other Horizon Health programs based on abilities and needs, dependent on the phase and extent of the emergency.

The concept of Mental Health operations during a nuclear emergency is based on the following three core functions.

- **Maintenance of Essential/Critical Services** including screening, intake and assessment, urgent treatment for new clients, and ongoing treatment and intervention for active clients with complex needs. Some non-critical activities such as skill groups may be suspended during the emergency if necessary.

- **Community in Crisis Response** including on-site counselling and de-briefing, telephone consultation; crisis intervention; crisis reduction counselling; defusing and debriefing; advocacy and mediation; education, and referral services. Disaster victims typically do not request services from the mental health system.
• **CISM for First Responders.** The regional Critical Incident Stress Management (CISM) team is responsible for providing CISM services to first responders, front line health care workers, other CISM members and emergency coordinators before, during and after a significant traumatic incident. If services of the provincial CISM team are required, they will be requested through the PEOC.

5.11 Management of Decedents Contaminated with Radioactive Material

An emergency at the PLGS with off-site implications poses very low risk of mortality or morbidity to the general public. Despite the low probability, the management of contaminated decedents necessitates advanced planning as specific guidelines, precautions and procedures are required and multiple organizations are implicated from within, and external to the health system. Any decedent at PLGS, within the 20km evacuation area, at one of the MDCs or any casualty transported to hospital from any of these areas, has the potential to be contaminated with radioactive material. The following sections provide provincial health guidance, policy direction and protocols regarding the management of the deceased in the context of a nuclear emergency at PLGS, where there are implications to the health system. It provides clarity on roles and responsibilities of implicated stakeholders specific to the safe handling and management of contaminated decedents, within the hospital and in community settings.

5.11.1 Dose Limit

Funeral home workers, coroner services, pathologists, morgue attendants, cemetery staff, spiritual care workers, and others implicated in death care are subject to the same dose limit as the general public. As such, protocols for the management of contaminated decedents must not result in exposure beyond this annual limit. To ensure those involved in death care as well as families and friends of the deceased are not exposed to radiation levels above the maximum annual limit for the public (1 milli Sievert or 1,000 micro Sieverts), a threshold has been set for releasing a decedent to funeral homes. Any decedent with a dose rate above 10 micro Sieverts per hour ($\mu$Sv/hour) above background levels will not be authorized according to Health guidelines, for release to the funeral home. At this maximum level, it would take 100 hours of close contact to reach the public dose limit. Special procedures for the management of decedents with dose rates above 10 $\mu$Sv/hour are discussed in Sections 5.11.4 and 5.11.5.

5.11.2 Personal Protection

Where a release of radioactive material has occurred, any emergency worker within the 20km emergency evacuation zone or the MDC, first receivers, first responders or any person handling a contaminated decedent, will require personal protective equipment (PPE).

5.11.3 Roles and Responsibilities

• **AMBULANCE NB**

ANB is responsible for emergency treatment and transport of patients to hospital emergency departments. They are not responsible for the transportation of the deceased, although may under certain circumstances be requested to do so by the Coroner. If first on scene, paramedics may have a role in confirming a death. Although there is no legislation in NB that explicitly states who is legally able to pronounce death, paramedics may be delegated this function.
• **NB EMERGENCY MEASURES ORGANIZATION**

NB EMO will provide the physical resources and coordination for establishing a temporary field morgue (at least two refrigerated trucks) and decontamination capability for decedents. They will also provide the physical resources and coordination for a temporary morgue (two or more refrigerated trucks) in proximity to the SJRH, as required. NB EMO is also responsible for arranging transportation in consultation with the Coroner and the RCMP, of any decedents from within the 20km emergency evacuation zone to the temporary field morgue.

• **CORONER SERVICES**

Coroner Services will be notified by a first responder or by the hospital, of any death related to a nuclear emergency. Decedents remain under the jurisdiction of the Coroner until released to the funeral home. For safety reasons, Coroner Services will not enter a radioactively contaminated area (MDCs, 20km emergency evacuation zone or PLGS) and as such, the decedent will be identified and cause of death investigated using all other appropriate means and information available to him/her, as per standard procedures. Coroner Services may consult with the Provincial Radiation Medical Advisor, Office of the Chief Medical Officer of Health and/or NB Power health physicist in decisions regarding the handling of contaminated decedents.

• **NB POWER / POINT LEPREAU GENERATING STATION**

In consultation with Coroner Services and the RCMP, NB Power/PLGS will decontaminate and transport the remains of any PLGS worker who dies on-site at the station.

NB Power/PLGS will be responsible for providing PLGS radiation protection qualified staff and equipment for surveying decedents from the 20km emergency evacuation zone and providing guidance on their safe handling in field, funeral home, burial site and hospital settings. Once all live evacuees have been decontaminated and transported to reception centres, PLGS will also provide PLGS radiation protection qualified staff for decontaminating and surveying decedents at MDC(s), placing the remains in a body bag and labeling them to prepare for transportation to hospital or funeral home. Where burial is required without going to a funeral home, by order of the MOH, PLGS radiation protection qualified staff will seal contaminated decedents in a metal casket, under the direction of the implicated funeral home (see Section 5.11.4 and 5.11.5).

All labeling of body bags and/or casket as per Section 5.11.4 and 5.11.5 is the responsibility of PLGS. Labels for body bags and/or caskets will be provided by PLGS along with an instruction guide for their proper application.

• **DEPARTMENT OF HEALTH, OFFICE OF THE CHIEF MEDICAL OFFICER OF HEALTH**

The Medical Officer of Health on-call will be contacted if there is a death related to a nuclear emergency. In the field setting the Medical Officer of Health on-call will be alerted by RCMP. The Medical Officer of Health on-call will conduct a risk assessment in consultation with Coroner Services and an NB Power health physicist to determine safe management. He/she may order funeral restrictions and special burial instructions, where required, as outlined in this guideline and in compliance with the Public Health Act.
For the purposes of a potential exhumation request of remains with burial restrictions related to radiation contamination, the Medical Officer of Health will direct the cemetery to maintain appropriate records. The Medical Officer of Health on-call will consider the authorization of such a request in collaboration with appropriate authorities and an NB Power health physicist.

- **SAINT JOHN REGIONAL HOSPITAL, HORIZON HEALTH**
  The SJRH hospital will be required to manage contaminated decedents should they die in hospital. In cooperation with PLGS, decedents within the hospital will be decontaminated to the greatest extent possible and prepared to be picked up and transported to the funeral home, as per standard hospital procedures. If a decedent remains contaminated above background levels, arrangements will be made to store the body in a temporary morgue in proximity to the hospital, until it is able to be handled safely; if radiation levels remain high and the decedent cannot be handled, a direct burial will be ordered without first going to a funeral home. When ordered by the Coroner, autopsies will be performed at the SJRH; however certain conditions will apply (see Section entitled ‘Autopsies’).

- **FUNERAL HOMES**
  The funeral home is responsible for the transportation of decedents to the SJRH morgue (if an autopsy is required) or to the funeral home as per normal procedure except where otherwise restricted (see Sections 5.11.4 to 5.11.6). Any special requirements ordered by the Medical Officer of Health on-call for burial, funeral practices and guidance to families and friends will be carried out by the funeral home as per guidelines contained in this document. High risk procedures as detailed in Section 5.11.6, such as cremation, embalming or open casket funerals, will be restricted as directed by the NB Power health physicist or PLGS radiation protection qualified staff and the Medical Officer of Health on-call.

- **RCMP**
  The RCMP will notify the Medical Officer of Health on-call and Coroner Services of any death involving radiation exposure or contamination. The RCMP will be consulted in any case where NB EMO must make arrangements for the transportation of any human remains from inside the 20km emergency evacuation zone or an MDC, to the temporary field morgue.

5.11.4 **Concept of Operations – Management of the Deceased in the Field Setting**

This section refers to the management of decedents on-site at PLGS (within a 1km radius around PLGS), within the 20km emergency evacuation zone, or at an MDC. There are two separate protocols, one for managing a decedent before the release of any radioactive material and another for managing a decedent when radioactive material has been released from PGLS.

- **NO RELEASE OF RADIOACTIVE MATERIAL**
  Prior to the release of radioactive material from PLGS, the only plausible scenario for a death involving a contaminated and/or exposed person will be on-site at PLGS or in
hospital after having been transported from PLGS. In the context of a nuclear emergency, this scenario could occur during a PLGS emergency classified as a Radiation Alert, Site Area Radiation Emergency or General Radiation Emergency (only where a release is imminent but has not yet occurred). In the event of a death at PLGS involving radioactive contamination, the RCMP will alert the Medical Officer of Health on-call (via PMCC, the Provincial Mobile Communication Centre) and Coroner Services. This process is depicted in Figure 9 and possible scenarios are described in Table 1.

PLGS is responsible to decontaminate the remains of any person who is deceased on-site, to the greatest extent possible. If a decedent has a dose rate that exceeds 1,000 μSv/hour, storage will be required at an on-site temporary morgue, at least 30 feet away from PLGS workers; PLGS Radiation protection qualified staff will decontaminate the decedent only once levels have dropped below 1,000 μSv/hour (see Table 1). Decedents at PLGS will be scanned for radiation and labeled appropriately (see Section 5.11.13 for label templates) even if free of contamination, before being transported to a funeral home, hospital morgue or on-site temporary field morgue. If a release of radiation is imminent, PLGS will also be responsible for transporting the deceased outside the emergency evacuation zone, to be received by funeral home personnel, rather than having the funeral home pick up the remains at PLGS. The process applied is dependent on the different plausible scenarios, as per Table 1. For a death in hospital after transportation from PLGS, see Section 5.11.5.
Figure 9. Management of an on-site death at PLGS without an off-site release of radioactive material.
• **WITH A RELEASE OF RADIOACTIVE MATERIAL**

In this scenario, a General Radiation Emergency would have been declared by PLGS. This section refers to Figure 10.

**On-Site At Point Lepreau Generating Station**

In the event of a death on-site at PLGS (within a 1 km radius around the plant), Coroner Services and the Medical Officer of Health on-call will be notified, the decedent will be surveyed by PLGS for radiation contamination, and decontaminated to the greatest extent possible (see Section 5.11.4). Under the direction of Coroner Services, human remains will be bagged, labeled and stored in an on-site temporary morgue (refrigerated truck) until the emergency event has been stabilized. At this point, PLGS will transport human remains to a temporary field morgue, outside of the 20km emergency evacuation zone in proximity to the MDC. PLGS will be responsible for maintaining a stockpile of body bags on site.

**Off-site**

If RCMP encounter a decedent in the course of evacuating the 20km emergency evacuation zone, they will, under the direction of Coroner Services, document the scene, secure the area, call the Medical Officer of Health on-call (via the PMCC) and leave remains in place until all live evacuees are safely out of the zone. If a Zone Warden encounters a decedent, 911 will be called, RCMP and in most cases ANB will respond, and the Medical Officer of Health on-call will be notified (via PMCC). The Off-site EOC will confirm with RCMP that the Medical Officer of Health on-call has been called. If ANB is called to the scene, they will confirm death and transport the remains to the temporary morgue under the direction of Coroner Services, otherwise transportation of remains will be arranged through Coroner Services, as appropriate.

A temporary field morgue will be established by NB EMO, in proximity to the MDC, triggered by the setup of the MDCs. Once live evacuees have been brought to safety, NB EMO in consultation with RCMP and Coroner Services will arrange transportation of any human remains from inside the 20km emergency evacuation zone or the MDC, to the temporary field morgue to be surveyed for radiation contamination. In consultation with Coroner Services, ANB may in certain circumstances transport a decedent to the temporary field morgue. At the temporary field morgue, PLGS radiation protection qualified staff will provide resources and equipment to survey decedents and provide advice on the safe handling of the remains. If decontamination is required, PLGS will decontaminate decedents, provide post-decontamination radiation monitoring and advise on the safe handling of the remains. There are four possible outcomes to the radiation survey and decontamination of decedents, which will each require a different approach as per Table 1, below.

Once processed through the temporary field morgue a decedent will be transported as directed by Coroner Services to the funeral home, burial site or to the hospital morgue, if an autopsy has been ordered. In a General Radiation Emergency, any decedent from PLGS, the 20km emergency evacuation zone or an MDC will be scanned for radiation and labeled appropriately by PLGS (as per label templates found in Section 5.11.13), before being transported to a funeral home or hospital morgue, even if free of contamination, i.e. never contaminated or successfully decontaminated. For decedents that remain contaminated any necessary precautions will be communicated to the
transporter or receivers (SJRH or funeral home), by the on-site PLGS radiation protection qualified staff.

**Figure 10.** Management of a death at PLGS, within the 20km emergency evacuation zone or at an MDC, with an off-site release of radioactive material.
Table 1. Possible Scenarios in the Management of the Deceased in Field Settings.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. The decedent has no measurable levels of contamination (dose rate is not above background level).</td>
<td>Radiation-specific precautions (such as special burial procedures or personal protective equipment) will not be required. Normal procedures can be followed and the remains can be released to the funeral home (or to the SJRH morgue if the Coroner orders an autopsy). Label body bag as being cleared of contamination (Green Label – as per Section 5.11.13).</td>
</tr>
<tr>
<td>ii. The decedent is externally contaminated with a reading of less than 1,000 μSv/hour and can be decontaminated using appropriate precautions.</td>
<td>This type of decedent will be processed and decontaminated prior to releasing the body to the funeral home (or SJRH if Coroner Services orders an autopsy). Label body bag as being cleared of contamination (Green Label – as per Section 5.11.13).</td>
</tr>
<tr>
<td>iii. The decedent is contaminated, with or without an embedded object containing radioactive material, with a reading of greater than 1,000 μSv/hour and cannot be handled without guidance from an NB Power health physicist or PLGS radiation protection qualified staff.</td>
<td>This type of decedent will need to be moved to a temporary morgue (on-site or off-site). An NB Power health physicist, the Coroner and the Medical Officer of Health on-call will determine how to manage the remains. This may require allowing time for radiation levels to drop below 1,000 μSv/hour through natural radioactive decay so that it can be handled for decontamination. Within the possible scenarios of a nuclear emergency at PLGS, this is an unlikely event. Label body bag as contaminated (Red Label - Section 5.11.13). After decontamination, the decedent will be re-surveyed for radiation contamination and will be managed according to the remaining level, as per scenario (i), (ii) or (iv), in this table. If radiation levels remain above 2X background level, the decedent will be placed in a sealed 21 gauge metal casket and buried in an in-ground metal or concrete vault without going to the funeral home, under the direction of the funeral home and Medical Officer of Health on-call, and under the guidance of an NB Power health physicist.</td>
</tr>
<tr>
<td>iv. Decontamination is unsuccessful because the decedent is internally contaminated.</td>
<td>For this type of decedent the body bag will be labeled as contaminated (Yellow Label - see Section 5.11.13). If dose rate is &lt;10μSv/hour above background level, the remains will be released to the funeral home, in accordance with Department of Health direction, guidelines and protocols. If dose rate is &gt;10 μSv/hour above background level, the decedent will remain in the temporary morgue at PLGS until natural radioactive decay brings the dose rate below 10 μSv/hour before releasing to the funeral home. If this is not possible within 10 days (the normal limit for holding human remains until burial), PLGS radiation protection qualified staff under the direction of the funeral home and the Medical Officer of Health on-call, will place the decedent in a 21 gauge metal casket to be sealed and buried without going to the funeral home.</td>
</tr>
</tbody>
</table>
5.11.5 Management of Contaminated Decedents in the Hospital Setting

At the direction of the SJRH a temporary morgue (two refrigerated trucks) will be established on hospital grounds at least 30 feet from the hospital, its workers and the public, with support from and in coordination with NB EMO (via the Regional Emergency Operations Centre) and PLGS. Depending on the emergency situation and in consultation with the PEOC or NB EMO, the temporary morgue setup will be triggered by the declaration of a Radiation Alert or Site Area Radiation Emergency by PLGS.

Any death in hospital involving radiation contamination or exposure will trigger an alert to Coroner Services and the Medical Officer of Health on-call.

**Decedent with a Dose Rate < 1,000 μSv/hour**

Any decedent contaminated with a dose rate of < 1,000 μSv/hour, who dies in hospital, whether originating from PLGS, the emergency evacuation zone or an MDC, will be decontaminated to the extent possible and re-surveyed for contamination. Decontamination will proceed at the SJRH's request, by a PLGS radiation protection qualified staff, using the SJRH decontamination resource. If successfully decontaminated, the decedent will be bagged and labeled as clear of contamination (Green Label – as per Section 5.11.13) and processed as per standard procedure.

Those who remain internally contaminated with any radiation level over background level will be labeled with a yellow label (as per Section 5.11.13) and transferred to the SJRH temporary morgue. These decedents are safe for PLGS radiation protection qualified staff to handle and must therefore be kept in a separate truck from those with high levels of contamination above 1,000 μSv/hour (see next paragraph below), which will be labeled with a red label (as per Section 5.11.13).

Similar to the procedure described for a death outside of the hospital, the dose rate of an internally contaminated decedent must decrease to less than 10 μSv/hour before the remains can be released to the funeral home. If rates remain above 10 μSv/hour after decontamination and if necessary storage at the SJRH temporary morgue (for a maximum 10 days), the decedent will be buried without first going to the funeral home. A funeral home(s) will be designated at the time of such an event, through consultation between the Office of the Chief Medical Officer of Health and the NB Funeral Directors and Embalmers Association. The direct burial will be carried out under the guidance of an NB Power health physicist and under the direction of the designated funeral home and Medical Officer of Health.

**Decedent with a Dose Rate > 1,000 μSv/hour**

Decedents with a dose rate > 1,000 μSv/hour above background levels cannot be decontaminated or otherwise handled without guidance from an NB Power health physicist or PLGS radiation protection qualified staff. These decedents will be labeled as such (Red Label – as per Section 5.11.13) and transferred to a second refrigerated truck designated for this dose rate threshold. A PLGS radiation protection qualified staff or NB Power health physicist will need to determine how long to store the remains until safe to handle and collaborate with the Medical Officer of Health and the designated funeral home to develop a case-specific death care plan. As for the procedure described for a death outside of the hospital, the dose rate must decrease to below 10 μSv/hour within
10 days of death otherwise a burial will be required without going to a funeral home, as described above. If the dose rate remains above twice background level, the casket must be buried in an in-ground concrete or metal vault.

**Decedent with Embedded Radioactive Object**

As part of decontamination in the hospital setting, any embedded object containing radioactive material must be removed prior to releasing a decedent to a funeral home. The medical team responsible for removing radioactive shrapnel will require METER training, as requested by the Coroner Services and in consultation with the Medical Officer of Health on-call. Planning such a task will require guidance from a PLGS radiation protection qualified staff to ensure safety of health personnel and the working environment.

- **AUTOPSIES**

Autopsies will not be performed on internally contaminated decedents unless absolutely necessary, as ordered by Coroner Services, because of the risk to the pathologist who may receive a significant radiation dose to the hands. Coroner Services will use other means of determining cause of death, wherever possible. If required, autopsies for an internally contaminated decedent will only be performed at the SJRH. The remains will be stored until a PLGS radiation protection qualified staff and/or NB Power health physicist is available to provide guidance in planning the autopsy, as necessary.

**5.11.6 Funeral Homes**

Funeral homes will not receive a decedent that has not first been externally decontaminated or where the dose rate of an internally contaminated decedent is unknown. Internally contaminated decedents will have been surveyed for radiation and labeled appropriately by a PLGS radiation protection qualified staff. As discussed under Section 5.11.1, decedents will not be released to funeral homes until radiation levels fall below 10 μSv/hour above background levels. At this level, it would take 100 hours of close contact (touching) to reach the public dose limit (1 mSv/year or 1,000 μSv/year). This will allow for the maximum time required for funeral homes to expedite a burial. Even at dose rates under 10 μSv/hour, standard procedures will be restricted for internally contaminated decedents. If the funeral home is required to perform high risk procedures on an internally contaminated decedent, a PLGS radiation protection qualified staff will provide guidance and on-site monitoring in planning these procedures, for the safety of workers and the public.

- **RESTRICTIONS ON FUNERAL PRACTICES**

Protocols for managing internally contaminated decedents, must respect the dignity of the deceased and of bereaved families and communities, while ensuring their safety. Funeral practices will however be limited to protect the health of the public; the dose limit for the public must be kept below 1 mSv/year (= 1,000 μSv/year).

**Below the 10 μSv/hour limit**

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20 Health Canada’s training program for first responders and hospital first receivers, for responding to a radiological or nuclear event, *Medical Emergency Treatment for Exposures to Radiation*

21 As per consultation with NB Funeral Directors and Embalmers Association.
The decedent may be released to the funeral home; some restrictions will apply however, if there are any measurable levels of radiation (above background levels) after placing the decedent in a body bag and further restrictions if measurable levels are detected after being sealed in a 21 gauge metal casket (see lists below).

Restricted practices for contaminated decedents with dose rates above background radiation levels, measured outside of the closed body bag:
- No cremation;
- No embalming;
- No open casket funeral;
- No washing of the decedent by family or community member.

Additional restricted practices for contaminated decedents with dose rates above background radiation levels, measured outside of the hermetically sealed 21 gauge metal casket:
- Cannot have body present at the funeral;
- Cannot sit with the decedent (for the purposes of ensuring they are not left unattended);
- Cannot release remains to the community for burial;
- Most religious or cultural timeline requirements for burial can be respected; however burial must be expedient.

Above the 10 μSv/hour limit
The decedent will not be released to the funeral home if the dose rate measures above 10 μSv/hour. Depending on the type of isotopes involved and where possible, decedents will be held in a temporary morgue until the dose rate drops through natural radioactive decay to below 10 μSv/hour above background levels. If this radioactive decay allows acceptable levels to be reached within 10 days of death (10 days is the normal limit for holding human remains until burial) the decedent will be released to funeral home with restrictions (see list above for dose rates below the 10 μSv/hour limit).

If levels cannot decrease to below 10 μSv/hour within 10 days of death, the decedent will be placed in a hermetically sealed 21 gauge metal casket at the temporary field morgue or temporary hospital morgue and buried without going to a funeral home, under the direction of the Medical Officer of Health and designated funeral home. Families will be offered a memorial service, without the body present.

Any specific religious or cultural requirements for positioning or wrapping the body can be done by designated PLGS personnel under direction of the funeral home and the Medical Officer of Health, as long as it is performed prior to shrouding, bagging, placing the remains into the casket and sealing, and as long as the dose rate of the decedent is below 1,000 μSv/hour.

5.11.7 Embalming
Embalmimg of internally contaminated decedents will be avoided for decedents with dose rates above background levels, as it increases radiation dose to funeral home staff.
5.11.8 **Cremation**
Internally contaminated decedents will not be cremated due to the high risk of contamination to the facility and the environment.

5.11.9 **Burial**
Although burial of a body with internal contamination poses only a minimal health risk to humans or the environment, internally contaminated decedents with dose rates above background levels will be buried in a sealed 21 gauge metal casket to minimize the release of radioactive material into the environment. A metal casket will be used with a seal that releases pressure from the inside, retarding the entry of ground water.

For dose rates greater than twice background levels, an in-ground, sealed metal or concrete vault will be required. Such a vault must be labeled on the exterior to indicate dose rate and the date and time of measurement.

5.11.10 **Transportation of Remains**
Prior to transporting, the decedent should be free of any loose surface contamination or shrapnel. The packaging and transport of human remains is an exception to the special requirements in the federal Packaging and Transport of Nuclear Substances Regulations. Transportation of the deceased within the province is normally done by funeral home personnel and does not require embalming as a prerequisite. To prevent the release of radioactive material into the environment, decedents must be transported in a sealed 21 gauge metal casket. The casket must be labeled accordingly with appropriate radiation level, as per labels found in Section 5.11.13. Embalming is required for shipping of human remains out-of-province, by any mode of transportation. Due to restrictions on embalming, out-of-province shipping will not be permitted for decedents with dose rates above background levels, as per Section 5.11.7.

5.11.11 **Mass Fatalities Management**
A nuclear emergency at PLGS is not expected to be a mass fatality event.\(^{22}\)

5.11.12 **Public Messaging**
Public messaging will be managed by the NBHEOC in collaboration with the Provincial EOC’s Joint Information Centre, as described in the NB EMO *Point Lepreau Generating Station Off-site Nuclear Emergency Plan*. Key messages should consider that despite the planning assumptions, the general public may perceive any death in the context of a nuclear emergency to be caused by deterministic effects (direct mortality from radiation exposure). Key messages should address this perception.

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\(^{22}\) There were 30 deaths related to the Chernobyl nuclear generating station accident in 1986, two of which were due to the explosion and the remaining 28 were firefighters who died of acute radiation syndrome. Although some plant workers received a significant dose of radiation, Fukushima Daiichi accident in 2011 did not result in any deaths directly related to radiation exposure.
5.11.13 **Sample Body Bag and/or Casket Labels for Decedents in a Nuclear Emergency**

All labeling of body bags and/or casket referenced throughout Section 5.11 is the responsibility of PLGS. Labels for body bags and/or caskets will be provided by PLGS along with an instruction guide for their proper application.

Use the green label when dose rate does not exceed background level:

![Green Label](image)

Use the yellow label when dose rate is 10 μSv/hour above background level but does not exceed 1,000 μSv/hour:

![Yellow Label](image)
Use the red label when dose rate exceeds 1,000 \( \mu \text{Sv/hour} \) above background level:

![Danger Label]

5.12 Public Communications

Communication in a nuclear emergency involves more than good media management. It is equally essential that all health system workers are able to communicate clear, simple, consistent, scientifically accurate messages to the clients who they serve. Consequently, reinforcing the key messages should be an integral part of health system education, training and exercises for nuclear emergencies (see Box 4). DH messaging has been pre-scripted for both mental health and for public health.

5.12.1 Spokespersons

- **Department of Health**

  There are two DH spokespersons for a nuclear emergency with off-site implications: The Chief Medical Officer of Health (CMOH) will be the official spokesperson for public health issues and the Radiation Medical Advisor for medical/clinical issues. As a best practice, both will be in attendance at news conferences.

- **Horizon Health**

  The official spokesperson for Horizon Health will be designated by the Executive Management Team. The spokesperson will provide information regarding the emergency to internal and external audiences including assigning their name to staff bulletins regarding the status of the emergency and participating in news conferences and media interviews.
5.12.2 **Public and Media Education**

If the population in the Point Lepreau area and local media both have at least an elementary understanding of the CANDU reactor and the health effects of radiation, then the difficulties of communication during an emergency will be much reduced. An ongoing program of public education and awareness is, therefore, an important aspect of emergency preparedness, preventing unnecessary stress-induced health problems and mitigating the effects of ignorance.

5.12.3 **Countering Misunderstanding and Misinformation**

In the public mind, the technology upon which the PLGS reactor is based is inappropriately equated to that which produced the atomic bomb. In addition, an uninformed or misinformed public may draw comparisons between any incident at PLGS and the earlier accidents at Three Mile Island in 1979 or, even more inappropriately, the Chernobyl disaster of 1986. The CANDU reactor at PLGS uses a different technology than either of those cases and the likely nature of any accident at PLGS would be much different. Furthermore, in the case of Chernobyl, the social and political environment was very different. In order to prevent misunderstanding or confusion, at no time should health system communication mention any of these nuclear incidents unless to rebut firmly any connection in the public mind.

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**Box 4: EXAMPLE KEY MESSAGES FOR ALL HEALTH SYSTEM PARTNERS**

Detailed key messages have been developed between DH, Horizon Health, NB Power/PLGS and Executive Council Office representatives. The following are examples of messaging considerations that should be presented consistently, not just by spokespersons but also by all front line health workers who interact with the public.

**For the Public:**

Nuclear emergency information can be complicated and worrying, so it must be translated into everyday jargon-free language. Use of easily understood analogies may be helpful (e.g. equating estimated dose to number of x-rays or amount of background radiation received while flying in an airliner at 30,000 feet - as below.

**Millisieverts (mSv):**

- 50.0 International Atomic Energy Agency’s annual limit for emergency workers in any single year
- 2.0 Average annual dose from natural radiation
- 0.04 Amount of cosmic radiation dose during a commercial airline flight across Canada
- 0.02 Typical chest x-ray

**For Health Workers**

Patients who have been exposed but not contaminated do not pose any radiation hazard; staff protection when treating people who are contaminated can be achieved by managing the four factors of time, distance, shielding and quantity.

**General**

There is little comparison between the CANDU reactor at PLGS and either Chernobyl or Three Mile Island.
### 5.13 Radiation Protection Qualified Staff - Resource Requirements

<table>
<thead>
<tr>
<th>Setting</th>
<th>Function</th>
<th>Number of Teams</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>SJRH Emergency Department</td>
<td>See six stations within the SJRH Emergency Department</td>
<td>5-6</td>
<td>• 2 posts could use portal monitors, other 4 should have friskers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 2 will need to be able to assist and advise medical teams in unstable patient room and non-ambulatory decontamination room. The other 4 teams will be for radiation monitoring.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCH Emergency Department</td>
<td>Screening and assistance with contaminated patient from the westerly MDC (pre-decontamination), requiring stabilization prior to transfer to SJRH</td>
<td>1, if deployment is requested</td>
<td>• Need frisker</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Deployed through request to Off-site EOC</td>
</tr>
<tr>
<td>Ambulance</td>
<td>Patient handling and Decontamination of vehicles</td>
<td>1, shared resource with SJRH ED</td>
<td>• Will be prioritized with SJRH requirements</td>
</tr>
<tr>
<td>SJRH diagnostic imaging and operating room</td>
<td>Consultation for planning tests and surgery</td>
<td>1, shared resource with SJRH ED</td>
<td>• Will require access to health physicist for consultation</td>
</tr>
<tr>
<td>SJRH Laboratory</td>
<td>Radiation measurement of specimens to support clinical treatment and consultation for spills, etc.</td>
<td>1, shared resource with SJRH ED</td>
<td>• Will require access to health physicist for consultation</td>
</tr>
<tr>
<td>SJRH and CCH worried-well field radiation monitoring post</td>
<td>Radiation screening in field</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Reassurance monitoring</td>
<td>Screen ‘worried-well’ in a location established by NB EMO, away from hospitals and reception centres</td>
<td>1 per 2 sites</td>
<td></td>
</tr>
<tr>
<td>Worried-well radiation screening</td>
<td>Screening at St Joseph’s hospital for those who bypassed MDC and for ‘worried-well’.</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Requirements in later phase of response, after first 48 hours:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SJRH decontamination area</td>
<td>Decontamination of a contaminated patient deceased in hospital</td>
<td>1, shared resource with SJRH ED</td>
<td></td>
</tr>
<tr>
<td>SJRH Morgue (Pathology Dept.)</td>
<td>Consultation for planning autopsy</td>
<td>1, shared with SJRH ED</td>
<td></td>
</tr>
<tr>
<td>Field morgues (refrigerated trucks in proximity to the SJRH and MDC)</td>
<td>Radiation screening Decontamination</td>
<td>1 per each of 3 field morgues, shared resources</td>
<td>• MDC resources will be shared with field morgues near MDCs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• SJRH ED resources will be shared with field morgue near the SJRH</td>
</tr>
<tr>
<td>Funeral homes</td>
<td>Consultation for planning funeral/burial</td>
<td>1, shared resource</td>
<td></td>
</tr>
<tr>
<td>Burial ground</td>
<td>Escort for direct burials with special orders by the Chief MOH</td>
<td>1, shared resource</td>
<td></td>
</tr>
</tbody>
</table>
5.14 Deactivation and Post-Emergency Recovery

5.14.1 Health System Recovery

The post-emergency recovery phase is the transition period in which the emergency response organization is deactivated, routine procedures are resumed and normal capability restored. Because this document supplements the all-hazards emergency management plans of its participating organizations, health nuclear emergency aspects of post-event activities are to be incorporated into the respective organizational all-hazard recovery processes. This includes, but is not limited to, deactivation processes, debriefing and post-incident reporting, record management and long-term recovery actions. Ambulances used to transport contaminated patients will need to be decontaminated; this will be done at the SJRH ambulance bay with PLGS radiation protection qualified staff. The ability to decontaminate an ambulance during the response to maximize emergency medical response will be considered on a case by case basis, depending on the ability to release PLGS radiation protection qualified staff assigned to the SJRH.

5.14.2 Population Served

Medical follow-up will be provided by the family physician with support from Health Canada and the OCMOH. It is incumbent on health services to ensure post-emergency health actions, including advice, counselling, and medical follow-up.

5.14.3 Registry of Evacuees

In the recovery phase of the emergency, the DH will establish a registry through the acquisition of demographic data collected by NB EMO in the process of registering evacuees as they exit the emergency evacuation zone. This registry will contain sufficient information to enable the identification of individuals who were in the emergency evacuation zone. It will be stored by the DH through the NB Cancer Network, the parameters of which will fully comply with the Personal Health Information Privacy and Access Act. The collection of additional data elements for epidemiological purposes is a responsibility of the OCMOH.

If an evacuee bypassed MDC registration due to a requirement for urgent transport to hospital prior to decontamination, the ANB Command Post lead will provide the evacuee’s name and destination information to Red Cross registration staff in the MDC. Any missing information can be acquired retrospectively from the hospital and added to the registry.
6. RESOURCE MANAGEMENT & DECISION SUPPORT

6.1 Resource Management

6.1.1 Principles
Management of human, physical, informational and financial resources is governed by the respective all-hazards emergency plans.

6.1.2 Provincial Emergency Stockpile
The DH maintains a provincial emergency stockpile of supplies, including personal protective equipment and other health supplies for use by Health Networks in emergency situations. In a nuclear event, the Provincial Emergency Stockpile Management Plan may be activated to meet a surge in demand by Horizon Health. Activation will be a multifactorial, real time decision based on factors such as a surge in demand, evidence of supply chain disruption, and/or manufacturers imposing ordering restrictions. Activation will be triggered through a decision by the NBHEOC Management Group in consultation with Horizon Health and Service NB (Health Services). The NBHEOC Director (or designate) will initiate deployment through communication with Service NB (Health Services). ANB is responsible for maintaining its own emergency stockpile of supplies.

6.1.3 National Emergency Strategic Stockpile
As part of the PHAC National Emergency Strategic Stockpile (NESS), the federal Health Portfolio maintains a limited supply of medical countermeasures (decorporating agents) for the treatment of internal radiological contamination. These supplies can be made available to provinces and territories upon request for use in response to a nuclear emergency. For NB during a nuclear emergency event, a request for these supplies must be made through the NBHEOC Director (or designate) as the provincial authority for NESS access. The NESS maintains a supply of the following countermeasures: Prussian Blue, Ca-DTPA, Zn-DTPA and potassium iodide (KI). These agents can be made available within 24 hours of a request. To minimize deployment time, the DH Emergency Preparedness and Response Branch will place NESS on standby with the declaration of a Site Area Radiation Emergency classification by PLGS.

6.2 Decision-support
A key function of the DH through the NBHEOC Management Group is to provide decision-support to decision makers at both the operational and policy levels. A significant challenge will be carrying out this responsibility in the context of the significant uncertainty that will likely accompany a nuclear emergency event.

The Decision Support function includes:
- collecting and analyzing data about the event, estimating its impact on the health system and assessing the capacity of the health system to respond;
- working with Departmental staff to use the gathered information to inform decision making.

The information collected and the analysis undertaken will also assist in providing situational awareness to key stakeholders.
Carrying out the Decision Support function may require the utilization of a variety of resources, tools, and processes:

- **information** about the event and its impact, and the capacity of the health system to respond; information will be shared with the DH by its partner organizations;

- the **decision support system** is a password protected, web-based data electronic system that was developed to facilitate the collection of data from the Health Networks, Ambulance New Brunswick and Telecare 811 to the NBHEOC. The decision support system will be used primarily as a tool to house and display information, and not as a primary data collection tool; the decision support system may also be used to support trending and strategic planning as well as historical data comparisons of some data elements (e.g. # emergency room visits, # admissions).
PART II

HEALTH SYSTEM ROLES & FUNCTIONS
7.0 HEALTH EMERGENCY MANAGEMENT

7.1 Overview

7.1.1 Role
The role of health emergency management at provincial, regional and facility levels in a nuclear emergency is to ensure coordination and control to effectively respond to and recover from a nuclear emergency. At each respective level, health emergency management is responsible for ensuring functional areas within its scope are able to undertake necessary actions and that its actions are coordinated and integrated with other emergency management partners.

7.1.2 Concept
Although the focus of a health response to a nuclear emergency is on Horizon Health (Saint John Area), a provincial health system response will be required to support the local response for the first 48 hours and the wider public health messaging and response throughout. The health system response must be integrated with the wider provincial response led by NB EMO. Further details on the concept of operations can be found in Section 1.3.

7.1.3 Command, Control and Coordination
Strategic and field command, control and coordination are outlined in detail in Section 1.3.
8. MEDICAL SERVICES IN HOSPITAL AND FIELD SETTING

8.1 Overview

8.1.1 Role
In a nuclear emergency it will be Horizon Health’s role to provide essential medical services to persons exposed to or contaminated with radiation, in hospital and in field settings including Monitoring and Decontamination Centres (MDCs), as required. Continuity of treatments and care services to the community-at-large must be maintained for the duration of the emergency. Designated sites within Horizon Health may be involved in distributing KI medication.

8.1.2 Concept
The SJRH is the designated health care facility for the PLGS for an on-site event. In an off-site event, the SJRH will serve as the designated medical facility for the treatment of radiation-related injuries and for receiving contaminated casualties requiring medical treatment from within the 20 kilometre emergency evacuation zone, PLGS and both MDCs. In compliance with the NB Trauma Program, evacuees with a trauma level 1, 2, or 3 will be transported to the SJRH regardless of where they originate within the evacuation area or at egress points, even if it means transportation through the plume.

Other facilities, sites and programs also have specific nuclear-related responsibilities as described in Section 5.7.

8.1.3 Command, Control and Coordination
Horizon Health is the Regional Health Authority responsible, under the New Brunswick Regional Health Authorities Act, to provide for the delivery and administration of health services within the boundaries of Horizon Health, including the 20km emergency evacuation zone. All hospital services required by on-site or off-site emergencies at PLGS are the responsibility of Horizon Health, if necessary drawing across its full range of community health centres and clinics, Addiction Services, Mental Health services, Public Health and Extra Mural Program. At the corporate level, Horizon Health has its own EOC which will be activated in an off-site emergency. The Horizon Health / SJRH EOC will liaise with the NBHEOC in the exchange of information and the operational implications of policy decisions, direction and interventions of the DH.
9. PUBLIC HEALTH

9.1 Overview

9.1.1 Role
The role of Public Health specific to a nuclear emergency is to provide:

- recommendations and guidance for areas of air, water and food quality with respect to human health hazards;
- public health messaging to the population;
- public health guidance regarding nuclear emergency response;
- order quarantine if required; and
- order potassium iodide administration, if required.

9.1.2 Concept

- Monitoring and Decontamination Centres Public Health Issues Responder. Regional Public Health staff trained in the health effects of radiation and equipped with print material and resource lists will be available in the post-decontamination area alongside mental health services to provide information, answer questions related to radiation and health, and make referrals to appropriate services. They will also be available to provide the same service remotely via radio, for evacuees in the pre-decontamination.

- Public Health Inspections for Reception Centres. The DH Health Protection Branch will conduct health and hygiene inspection of reception centre sites through Public Health Inspectors prior to opening and monitor the facility, as required.

- Public Health Guidance. OCMOH provides advice and guidance on public health matters to residents of NB, government departments, representatives of response organizations, the Nuclear Control and Technical Advisory Groups. It provides guidance regarding the distribution and dosing of KI pills, food, air and water safety, funeral service and burial restrictions and other public health measures.

- Public Health Information Brochure. OCMOH publishes a printed information brochure as a resource to support Horizon Mental Health Services and Regional Public Health field roles, for distribution at Monitoring and Decontamination Centres as well as reception centres.

  - ensure the public receives pertinent public health information in a timely manner to prevent adverse health effects related to the event; and
  - respond to all media calls transferred from Tele-Care 811 within 24 hours.

- Public Health Messaging. OCMOH provides content expertise for public health messaging for NB EMO Communications and Health Communications and provide a spokesperson for the Department of Health.

9.1.3 Command, Control and Coordination
The CMOH is responsible to the Minister of Health for direction and development of Public Health policy and for the administration of the Public Health Act and its Regulations. In a nuclear emergency which would pose a danger to the general public, the CMOH or delegate will ensure appropriate Public Health response including linkages with the Provincial Nuclear Control Group at the PEOC as necessary. At the regional level, the Regional Medical Officer of Health (RMOH)
for the affected region will direct Public Health response in cooperation with Horizon Health or Vitalité Health and other relevant responding agencies.
10. MENTAL HEALTH

10.1 Overview

10.1.1 Role

The role of Mental Health in a nuclear emergency is to assist individuals, families, caregivers and responders who may experience emotional and psychological stress related to the event, as well as provide essential psycho-social resources and support at MDCs as well as Reception Centres, as required.

10.1.2 Concept

Mental health (psychosocial) issues can be a critically important factor in nuclear emergency response. The actual risk from radiation is usually much less than the probability of worry-induced stress. Even if exposure or contamination do occur, the number of “worried well” is likely to far exceed the number actually affected physically. Because much of the fear results from a lack of understanding about radiation, Mental Health will cooperate with Public Health, Communications, Tele-Care 811 and other response agencies to disseminate consistent messages (see Section 12 – Communications). Emergency coordinators will be designated for each mental health centre to perform core Mental Health emergency functions as follows.

- **Essential Services Leader**, who establishes a plan for maintenance of essential services, determines activities to be suspended,(arranges staff employment, identifies high needs clients and coordinates logistics requirements.

- **Community in Crisis Response Leader**, who develops and implements an outreach plan for connecting with individuals impacted or requiring information, and coordinates provision of mental health services and delivery of information on-site.

- **CISM Team Leader** who coordinates the Centre’s contribution to the regional CISM team which is coordinated through the Horizon Health / SJRH EOC.

- **Logistics Leader (Administrative Support)** who coordinates logistics requirements through the Horizon Health / SJRH EOC.

- **Psychological First Aid** is designed to reduce the initial distress caused by traumatic events, and to foster short- and long-term adaptive functioning.

10.1.3 Command, Control and Coordination

As described in Section 8.1.3, Horizon Health is the Regional Health Authority responsible, under the New Brunswick *Regional Health Authorities Act*, to provide for the delivery and administration of health services within the boundaries of Horizon Health, including the 20km emergency evacuation zone. All addictions and mental health services required by on-site or off-site emergencies at PLGS are the responsibility of Horizon Health, if necessary drawing across its full range Addiction and Mental Health services. At the corporate level, Horizon Health has its own EOC which will be activated in an off-site emergency. The Horizon Health / SJRH EOC will liaise with the NBHEOC in the exchange of information and the operational implications of policy decisions, direction and interventions of the DH Addictions and Mental Health branch.
11. EMERGENCY MEDICAL SERVICES (EMS)

11.1 Overview

11.1.1 Role

ANB is the single ambulance service provider for the Province. The role of ANB in a nuclear emergency is to provide land ambulance services to the PLGS, evacuation Traffic Control Points, MDCs, Reception Centres, in addition to responding to normal patient requests in and around the Point Lepreau area.

11.1.2 Concept

During an on-site emergency at the PLGS site, all patients in need of further care for radiological contamination or exposure emergencies will be transported to the SJRH. ANB response to PLGS is governed by Operations Policy 4221; Operations Policy 4213, and; Hazardous Materials Response.

During an off-site incident, a number of actions are established to ensure the safety of the communities surrounding the station. During an off-site incident, the following actions will be undertaken by ANB to respond to the potential or real crisis through collaboration with other Public Safety actions being undertaken.

- Precautionary Evacuation - During a precautionary evacuation, ANB will support efforts of moving patients that may require non-traditional transportation modes. Initial assigned resources will include the ANB staffed unit from the PLGS, one additional staffed unit from an adjacent district and one NBEMS Manager from the South Region. The NBEMS Manager will report to the Command Post and through this point of consultation extra resources may be assigned to support the precautionary evacuation.

- Evacuation due to hazard - During an off-site emergency, in preparation for the increased volume of evacuees passing through the decontamination corridor, ANB will position four staffed units and one NBEMS manager at the Decontamination Centre during the initial 24 to 48 hours of the incident. The personnel assigned to this event will follow actions contained in ANB Nuclear Response JAS1 and JAS2. At this location, two ambulance crews will perform medical assessments for evacuees who self-present or are referred by Red Cross for medical care and two ambulance crews will standby to provide treatment and emergency transport, as per Section 5.4.6. The ‘health check’ will be performed on evacuees who self-identify as having health concerns or for those identified by Red Cross registration as wearing an orange bracelet (contaminated) or as having health concerns. All patients in need of further care for radiological emergencies will be transported to the SJRH. For those that fail decontamination (orange bracelet) they will be directed to a dedicated shuttle and for those who have not yet been screened for contamination but require urgent care they will be transported by ambulance with appropriate precautions (PPE).

- Ambulance service to the community affected by an off-site emergency is governed by all-hazard standard operating procedures for emergencies; paramedics will take all precautions mandated by the hazard to ensure safety of themselves during response activities. ANB will continue to participate in emergency medical care activities inside the emergency evacuation zone during the evacuation of the community while safe to do so. When radiological contamination is above safe levels as determined by the Nuclear
Control Group, ANB’s activities will withdraw to the outside of the emergency evacuation zone and standby for further requests. Entry back into the emergency evacuation zone after safe levels are exceeded will be for emergencies and while wearing NB EMO issued PPE.

- All ANB paramedics will be issued PPE (not required to be donned immediately as they will be stationed in the ‘cold’ zone) by the MDC stores and equipment trailer upon arrival at Command Post staging area. PPE is provided as precaution for emergency response requests within the Decontamination Centre and within the emergency evacuation zone. If an ambulance or crew is required to enter the Decontamination Centre or the emergency evacuation zone, that ambulance or crew will not be permitted to immediately leave that zone. This requires the patient to proceed through the decontamination process when medical stability allows or handed-off across the zone perimeter to a non-contaminated ambulance to continue transport to SJRH in cases of medical emergency. The contaminated ambulance will be set aside for future responses within the emergency evacuation zone as required or decontaminated if deemed possible by radiation protection specialists. The paramedics will be required to proceed through the decontamination process before leaving the emergency evacuation zone and returning to duty.

- ANB will support reception centre operations with a single unit during the initial 24 to 48 hours when most evacuees will arrive, and participate in the Canadian Red Cross Control Centre at primary reception centre sites. This service is to further reassure and assist those that may sustain adverse health effects from the evacuation process. After the initial 48 hours, coverage will still be provided, but through the established NB-911 system.

11.1.3 Command, Control and Coordination

ANB’s Emergency Medical Dispatchers are located at its Medical Communications Management Center (MCMC) in Moncton. They are responsible for dispatching and coordinating ambulance response to all requests within the province; including those triggered by an on-site or off-site nuclear emergency. An NBEMS Manager will be responsible for both the easterly and westerly MDC Command Posts; ANB Command will be delegated to this individual over those resources assigned to the incident. The NBEMS Manager will be the point of contact on ANB activities such as decontamination, patient transports, and Occupational Health and Safety concerns. ANB Command will join with other command / coordinators and provide an account of ANB activities during planning cycle meetings using the Health Emergency Preparedness: Nuclear Decision Support – Ambulance Services form. ANB Command will provide a full site report on agency activities back to the ANB EOC and MCMC environments for strategic resource planning purposes.
12. COMMUNICATIONS

12.1 Overview

12.1.1 Role
The role of health system communications in a nuclear emergency is to disseminate timely, accurate and consistent health messages and to prevent or mitigate the negative effects of public misunderstanding of nuclear issues, in coordination with the Emergency Information Services organization.

12.1.2 Concept
The most significant health risk of an incident at the PLGS is unlikely to be radiation, but rather fear-induced stress arising from misunderstanding or conflicting information. Furthermore, “effectively communicated health messages can influence individual citizens, health care providers and other professionals, and policy makers at all levels as they make health protection decisions; therefore these messages can have a direct and highly significant effect on the health and safety of large segments of the population. For any levels or amounts of exposure, even miniscule, people will want to know what health effects they may have in the future.23 Disciplined communication management, with consistent, clear and accurate messages, are vital elements in effective health system response. Tele-Care 811 will be an important element of reassurance for those who have specific queries (see Section 13). Example key messages appropriate to a nuclear emergency, are suggested in Box 4 on the following page. Communication during a nuclear emergency will be in accordance with the all-hazards crisis communication plans at both the provincial and regional levels.

12.1.3 Command, Control and Coordination
Emergency Information Services organization is the provincial lead agency for government communications. Emergency Information Services organization comprises Executive Council Office, departmental communications staff, and NB Power public affairs staff. For the duration of a nuclear emergency, the Emergency Information Services acts as coordinator and a clearing house for all government strategic communications, operational communications and emergency public information. At the provincial health system, regional and local level, the communication process will require close teamwork between the DH, Horizon Health, ANB, the provincial Nuclear Control Group and NB Power to develop and disseminate timely, accurate and consistent messages. In practice this will be four-way coordination between the Communications and Community Relations representative in the Horizon Health / SJRH EOC located in the SJRH, ANB EOC, NB Power’s Point Lepreau Off-site EOC, the NBHEOC and the PEOC’s Emergency Information Services in Fredericton. If the City of Saint John EOC is activated, it should also be kept informed.

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13. TELE-CARE 811

13.1 Overview

13.1.1 Role
The role of Tele-Care in a nuclear emergency is to provide nuclear-related health and care information to residents of the province of New Brunswick who access the Tele-Care 811 system.

13.1.2 Concept
Public messaging during a nuclear emergency will include the promotion of Tele-Care 811 for information and advice on:

- Food, air and water safety;
- KI information;
- Care and advice information from registered nurses;
- Media inquiries;
- Referral for information on:
  - Reception centres,
  - Road closures,
  - NB EMO helpline

13.1.3 Command, Control and Coordination
The NBHEOC will be responsible for the command, control and coordination of Tele-Care 811 services. The Primary Health Care lead in the NBHEOC will serve as the liaison with Sykes Canada, the Tele-Care 811 service provider. Working closely with content experts and communications at both the provincial and regional level, information and messaging will remain current and consistent with provincial messaging and with the response to the emergency event, available in both official languages.
14. PROVINCIAL RADIATION MEDICAL ADVISOR

14.1 Overview

14.1.1 Role

The Provincial Radiation Medical Advisor’s role in a nuclear emergency is to provide medical advice and ensure consistency, integration and communication of clinical information across the health system.

14.1.2 Concept

The role of the Provincial Radiation Medical Advisor will be fulfilled through:

- providing a liaison with Health Canada and interpret real-time information from radiation experts;
- providing medical advice to the NB Health Emergency Operations Centre, the Saint John Regional Hospital Medical Lead;
- participating in the Provincial Emergency Operations Centre as a member of the Technical Advisory Group;
- responding to policy-specific medical questions from Tele-Care 811; and
- acting as spokesperson regarding medical issues, working closely with the Chief Medical Officer of Health.

14.1.3 Command, Control and Coordination

The Provincial Radiation Medical Advisor will serve as a member of the Technical Advisory Group as part of the PEOC Nuclear Control Group, providing medical advice and recommendations in collaboration with the Chief Medical Officer of Health. In addition, he/she will also be a virtual member of the NBHEOC.
## 15. Roles and Responsibilities for the Health System

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<tr>
<th>ROLES</th>
<th>TASKS/FUNCTION</th>
<th>RESPONSIBILITY CENTRE</th>
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<tbody>
<tr>
<td><strong>PERSONAL CARE ASSISTANT</strong>&lt;br&gt;1 team of 2 personnel per shift on decontamination line, for each Monitoring and Decontamination Centre</td>
<td>• There will be 3 decontamination lines (male, female and one for those requiring assistance).&lt;br&gt;• Assist as needed with evacuees requiring support during the decontamination process (disrobing, showering, dressing in modesty garments, bagging and tagging personal effects, managing medical equipment such as oxygen, an ostomy or a wheelchair, etc.).</td>
<td>Horizon Health Network, Personal Service Workers</td>
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<tr>
<td><strong>MEDICAL EMERGENCIES FIRST AID RESPONDERS</strong>&lt;br&gt;1 paramedic crew per site, per shift, in post-decontamination area of each Monitoring and Decontamination Centre&lt;br&gt;Additional paramedic crews deployed at the discretion of ANB command</td>
<td>General&lt;br&gt;Provision of first aid, trauma triage, medical assessment, treatment and emergency transportation.&lt;br&gt;&lt;br&gt;<strong>Pre-decontamination</strong>&lt;br&gt;1) Emergency treatment and transport, as required. Life-threatening injuries take precedence over decontamination; use reverse protection where required.&lt;br&gt;&lt;br&gt;<strong>Post-decontamination</strong>&lt;br&gt;2) Transport individuals presenting with a requirement for medical assessment or treatment.&lt;br&gt;3) Perform a medical assessment on evacuees who self-identify as requiring medical care or are referred by Red Cross registration staff as requiring medical care.</td>
<td>Ambulance NB</td>
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<tr>
<td><strong>TRIAGE FOR DECONTAMINATION PRIORITY</strong>&lt;br&gt;1 paramedic crew per site, per shift in pre-decontamination area of each Monitoring and Decontamination Centre</td>
<td>• Identify vulnerable evacuees for prioritizing decontamination queue&lt;br&gt;• Facilitate radio access to public health or psychological first aid resources positioned in the post-decontamination area, if evacuees are flagged as requiring intervention before the decontamination process.</td>
<td>Ambulance NB</td>
</tr>
<tr>
<td><strong>PSYCHOLOGICAL FIRST AID RESPONDERS</strong></td>
<td>• Address psychosocial concerns of evacuees in the post-decontamination area of Monitoring and Decontamination Centres.</td>
<td>Horizon Health Network, Regional Mental Health</td>
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<td>ROLES</td>
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| 1 team of 2 personnel per shift in the post-decontamination area for each Monitoring and Decontamination Centre | • Provide group crisis management briefings.  
• Provide individual crisis interventions, if required.  
• Address potential exacerbations of pre-existing mental conditions.  
• Provide psychological consult in pre-decontamination area via radio, facilitated by NB EMO and ANB. |                                                                                                                      |
| COMMAND POST, HORIZON SERVICES COORDINATOR  
1 per site, per shift | • Participate as part of the command post and represent health services roles in the field to:  
  o coordinate operational activities  
  o relay tactical issues  
  o access and communicate information/expertise to and from SJRH EOC  
• Communicate with NBHEOC via SJRH EOC (as needed)  
• Oversees all Horizon Health’s health services roles on site  
• Coordinate with Command Post team members  
• Ensure staff replacement when needed | Horizon Health Network                                                                                           |
| COMMAND POST, ANB SERVICES COORDINATOR  
1 command resource (operational support unit) responsible for ANB roles in both Monitoring and Decontamination Centres. | • Participate as part of the command post and represent ANB roles in the field to:  
  o coordinate operational activities  
  o relay tactical issues  
  o access and communicate information/expertise to and from ANB EOC  
• Communicate with NBHEOC via ANB EOC (as needed)  
• Oversees all ANB roles on site  
• Coordinate with Command Post team members  
• Ensure staff replacement when needed | Ambulance NB                                                                                                     |
| PUBLIC HEALTH ISSUES RESPONDER  
1 team of 2 personnel per shift, in post-decontamination area of both Monitoring and Decontamination Centres | • Partner with the Psychological First Aid Responder in the post-decontamination area to provide evacuees with assistance in navigating information provided (e.g. the public health brochure), answering their health-related questions and/or directing them to resources.  
• Provide consultation to evacuees in the pre-decontamination area via radio, as identified by ANB. | Horizon Health Network Public Health                                                                               |
| RECEPTION CENTRE                                                                                       |                                                                                                                      |                                                                                                                      |
| PSYCHOLOGICAL FIRST AID RESPONDERS | • Address psychosocial concerns of evacuees, in Reception Centres  
• Provide Crisis Management Briefings | Horizon Health Network, Addictions and Mental Health Services                                                        |
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| Minimum of one team with 2 personnel per shift, per Reception Centre (may begin with 3 to 4 personnel per shift and decrease as situation warrants) | • Provide individual crisis interventions, if required.  
• Address potential exacerbations of pre-existing mental conditions |  |
| EXTRA-MURAL PROGRAM | • Monitoring and tracking of displaced EMP clients within emergency evacuation zone  
• Caring for displaced clients and collaborating with Red Cross and other partners and agencies to make appropriate care and short term living arrangements.  
• Assess new patients referred by ANB and related to the emergency, that meet EMP eligibility criteria and within EMP scope of practice. | Horizon Health Network, Extra-mural Program |
| MEDICAL EMERGENCIES FIRST AID RESPONDERS | Provision of first aid, trauma triage, medical assessment, treatment and emergency transportation. | Ambulance NB |
| PUBLIC HEALTH INSPECTOR | Inspect and Assess Reception Centre for air and water quality, general sanitation, personal hygiene, food safety and communicable disease control. Ensure compliance with the Smoke Free Places Act. General sanitation inspection and assessment of facility of Reception Centres and to prevent communicable disease outbreaks. | DH Public Health Inspectors |
| HORIZON HEALTH LEAD, CANADIAN RED CROSS CONTROL CENTRE | • Participate as part of the Canadian Red Cross Control Centre and represent health services roles in Reception Centres to:  
  o coordinate operational activities  
  o relay tactical issues  
  o access and communicate information/expertise to and from SJRH EOC  
• Communicate with NBHEOC via SJRH EOC (as needed)  
• Oversees all Horizon Health’s health services roles on site  
• Coordinate with Command Post team members  
• Ensure staff replacement when needed | Horizon Health Network |
| ANB LEAD, CANADIAN RED CROSS CONTROL CENTRE | • Participate as part of the Canadian Red Cross Control Centre and represent ANB roles in Reception Centres to:  
  o coordinate operational activities | Ambulance NB |
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| 1 per centre, per shift, (resource may be drawn from paramedic crew already on-site). | o relay tactical issues  
o access and communicate information/expertise to and from ANB EOC  
• Communicate with NBHEOC via ANB EOC (as needed)  
• Oversees all ANB roles on site  
• Coordinate with Command Post team members  
• Ensure staff replacement when needed |                                                                                       |
| **PATIENT MANAGEMENT (other than decontamination sites)** |                                                                                       |                                                                                       |
| Emergency Medical Services                                           | • Emergency medical transport and treatment of casualties, as required               | AmbulanceNB                                                                           |
| Saint John Regional Hospital and Charlotte County Hospital            | • Upon notification, triggers preparation of staff and treatment area, equipment and signage, as well as lock-down, as per Saint John Regional Hospital/Charlotte County Hospital operations plan | Horizon Health Network, Saint John Regional Hospital and Charlotte County Hospital     |
| **FIRST RECEIVERS**                                                   | • Implement appropriate code.                                                        | Horizon Health Network, Saint John Regional Hospital and Charlotte County Hospital     |
| Staffed according to the Saint John Regional Hospital Operational Plan| • Treat patients as per treatment protocol established  
• Transfer to other specialized health care facility as required and as per usual practice  
• Decontaminate patients when possible and assess patients from pre-hospital site who failed two decontamination attempts.  
• Admit and discharge as per establish admission/discharge criteria  
• Involve other Horizon Health facilities and Extra-Mural Program, as needed | Horizon Health Network, Saint John Regional Hospital and Charlotte County Hospital     |
| In-patient care and supporting services                              | • Prepare unit (diagnostic imaging, surgery, pathology and laboratory and others) and staff for potential contaminated patients  
• Occupational Health and human resources (labour relations)               | Horizon Health Network, Saint John Regional Hospital and Charlotte County Hospital staff |
| Staffed as per SJRH operation plans                                   | • Emergency Department - screening, triage, assessment, decontamination and treatment of patients  
• In-patient care services – Diagnostic imaging, morgue, lab, surgery and other in-patient services  
• Other (support marine radiation monitoring and decontamination, KI pill distribution) | Horizon Health Network                                                                  |
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| Tele-Care 811         | • Nuclear-related health and care information to residents of the province of NB who access the Tele-Care 811 system. Monitor website(s) for service updates.  
                          • Public messaging regarding: 1) instructions on food and water safety; 2) Information on KI; 3) advice and information on care  
                          • Referrals for information on the status of PLGS employees, NB EMO helpline, 511 road conditions (blockades), reception centres; Direct media inquiries | Dept. of Health, Tele-Care          |
|                       |                                                                                                 |                                      |
| **OTHER HORIZON HEALTH FACILITIES’ SERVICES** |                                                                                                   |                                      |
| Supporting Facilities | Sites and programs in the area surrounding PLGS between St. Stephen and Sussex:  
                          • Support to Saint John Regional Hospital if capacity is reached and for the ‘worried well’ (St. Joseph’s Hospital)  
                          • Support to Charlotte County Hospital if capacity if reached.  
                          • Support to the marine radiation monitoring and decontamination centre at Blacks Harbour (Fundy Health)  
                          • Preparedness to advise or counsel drop-in queries from concerned people. Issue pills from KI stockpile if instructed (Campobello, Deer Island, Grand Manan Health Centres) | Horizon Health Network               |
| Mental Health Services | As required  
                          • Assist individuals, families, caregivers and responders who may experience emotional and psychological stress in any setting Crisis Intervention Stress Management for first responders and receivers  
                          • Communities-in-crisis services  
                          • Address potential symptoms of mental illness exacerbation |                                      |
|                       |                                                                                                   |                                      |
| **PUBLIC HEALTH AND COMMUNICATIONS** |                                                                                                   |                                      |
| Public Health - Advisories, guidance, | • Guidance and advice for air quality, food and water safety  
                          • Guidance and advice on Public Health measures e.g. quarantine, care of the deceased, KI administration  
                          • General sanitation inspection in reception centres to prevent communicable disease outbreak  
                          • Collaborate with Radiation Medical Advisor radiation on medical issues | Office of the CMOH, Horizon Health Network Public Health |
|                       |                                                                                                   |                                      |
## ROLES

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<tr>
<th>HEALTH COMMUNICATIONS</th>
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<tbody>
<tr>
<td><strong>TASKS/FUNCTION</strong></td>
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<tr>
<td>- Public health / medical messaging, service interruptions</td>
</tr>
<tr>
<td>- Real time updating of Dept. of Health public website</td>
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<tr>
<td>- Provide advanced notice to Tele-Care 811 regarding changes to Department of Health website</td>
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<tr>
<td>- Coordination between DH Communications, EMO / PEOC and Regional Communications</td>
</tr>
<tr>
<td>- Respond to media inquiries</td>
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<tr>
<td>- Disseminate timely, accurate and consistent health messages and to prevent or mitigate the negative effects of public misunderstanding of nuclear issues</td>
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<td>Department of Health Horizon Health Network Ambulance NB</td>
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## RECOVERY

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<tr>
<th>REGISTRY OF EVACUEES (HEALTH)</th>
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<tbody>
<tr>
<td><strong>TASKS/FUNCTION</strong></td>
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<tr>
<td>- Demographic information to be collected by EMO / PLGS at Evacuation Traffic Control Points or Red Cross registration (where Monitoring and Decontamination Centres are activated).</td>
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<td>- A registry of evacuees will be held in the NB Cancer Network.</td>
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<tr>
<td><strong>TASKS/FUNCTION</strong></td>
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<tr>
<td>- Air, water, soil, food guidance and advice</td>
</tr>
<tr>
<td>- Public messaging and advisories</td>
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<tr>
<th>RESPONSIBILITY CENTRE</th>
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<tr>
<th>ADDICTIONS AND MENTAL HEALTH SERVICES</th>
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<tbody>
<tr>
<td><strong>TASKS/FUNCTION</strong></td>
</tr>
<tr>
<td>- Psychosocial support to the community</td>
</tr>
<tr>
<td>- Assist individuals, families, caregivers and responders who may experience emotional and psychological stress in any setting Crisis Intervention Stress Management for first responders and receivers</td>
</tr>
<tr>
<td>- Communities-in-crisis services</td>
</tr>
<tr>
<td>- Address potential symptoms of mental illness exacerbation</td>
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<tr>
<th>RESPONSIBILITY CENTRE</th>
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<tbody>
<tr>
<td>Horizon Health Network</td>
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<table>
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<tr>
<th>DH COMMUNICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TASKS/FUNCTION</strong></td>
</tr>
<tr>
<td>- Public health / medical messaging, service interruptions</td>
</tr>
<tr>
<td>- Real time updating of Dept. of Health public website</td>
</tr>
<tr>
<td>- Provide advanced notice to Tele-Care 811 regarding changes to Department of Health website</td>
</tr>
<tr>
<td>- Coordination between DH Communications, EMO / PEOC and Regional Communications</td>
</tr>
<tr>
<td>- Respond to media inquiries</td>
</tr>
<tr>
<td>- Disseminate timely, accurate and consistent health messages and to prevent or mitigate the negative effects of public misunderstanding of nuclear issues</td>
</tr>
</tbody>
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<tr>
<th>RESPONSIBILITY CENTRE</th>
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<tr>
<td>Department of Health</td>
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<tr>
<td>ROLES</td>
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<tr>
<td><strong>EMERGENCY RESPONSE STRUCTURES</strong></td>
</tr>
<tr>
<td><strong>PROVINCIAL EMERGENCY OPERATIONS CENTRE (PEOC) NUCLEAR CONTROL GROUP</strong></td>
</tr>
</tbody>
</table>
| Emergency Preparedness and Response Branch, Director / PEOC lead     | • Advise and inform on overall health system response  
• Provide health-specific information  
• Liaise with other government departments on emergency response actions | Department of Health, Emergency Preparedness and Response Branch                                               |
| Chief Medical Officer of Health / Regional Medical Officer of Health (Saint John Region) | • Serve on Control Group’s Technical Advisory Group  
• Serve as spokesperson regarding public health issues, working closely with the Radiation Medical Advisor  
• Recommendations and guidance regarding air, water and food quality with respect to human health hazards  
• Provide public health guidance and advice to the public regarding nuclear emergency response  
• Order quarantine or special burial arrangements, as required. | Department of Health, Office of the Chief Medical Officer of Health                                            |
| Provincial Radiation Medical Advisor                                 | • Liaise with Health Canada – interpret real time information from radiation experts  
• Provide medical advice to PEOC Nuclear Control Group, NBHEOC and SJRH Medical Lead.  
• Serve on Control Group’s technical advisory group (as required).  
• Act as spokesperson regarding medical issues, working closely with the Chief Medical Officer of Health | Department of Health, NB Cancer Network                                                                      |
| Others as required                                                   | • Liaison functions - Ambulance Services, Mental Health Services, Communications, etc…                                                                                                                                 | Department of Health                                                                                               |
| **NB HEALTH EMERGENCY OPERATIONS CENTRE (NBHEOC)**                   |                                                                                                                                                                                                             |                                                                                                                                 |
| NB Department of Health Emergency Operations Centre (Executive, Strategic Operations, Communications) | • Coordination, support and strategic operational oversight regarding operationalization of provincial nuclear and all-hazards emergency plans  
• Ongoing liaison and provision of advice, guidance and policy direction to Horizon Health Network, AmbulanceNB, Service NB.  
• Ongoing executive management briefing  
• Executive Management oversight and policy direction  
• Strategic operational support and coordination:  
  o Primary Health Care / Tele-Care 811  
  o Mental Health / Psycho-social | Department of Health Regional Health Authorities Service NB Ambulance NB                                       |
<table>
<thead>
<tr>
<th>ROLES</th>
<th>TASKS/FUNCTION</th>
<th>RESPONSIBILITY CENTRE</th>
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<tr>
<td>Extra-mural</td>
<td>o Extra-mural</td>
<td>o Public Health</td>
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<td>Public Health</td>
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<tr>
<td>Clinical / Hospital Services</td>
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<tr>
<td>Human Resources</td>
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<tr>
<td>Health communications</td>
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<tr>
<td>Decision Support</td>
<td>• Collection, analysis and display of information from various sources within the health system (Regional Health Authorities, ANB, Service NB, and Tele-Care 811) to support decision-making and strategic planning.</td>
<td>Health system impact analysis / assessment</td>
</tr>
<tr>
<td>Resource Management</td>
<td>• Provincial Emergency Stockpile</td>
<td>Department of Health</td>
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<tr>
<td></td>
<td>• NESS</td>
<td>Service NB</td>
</tr>
<tr>
<td></td>
<td>• Human Resources / Mutual Aid</td>
<td>Regional Health Authorities</td>
</tr>
<tr>
<td>Liaison</td>
<td>• Ongoing with Provincial EOC, Federal Partners</td>
<td>Ambulance NB</td>
</tr>
</tbody>
</table>

### HORIZON HEALTH EMERGENCY OPERATIONS CENTRE (Horizon Health/SJRH EOC)

<table>
<thead>
<tr>
<th>Position</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Operations Centre Staffing and Executive</td>
<td>As per Horizon Health Network’s all-hazards health emergency management plan</td>
</tr>
<tr>
<td>Liaisons to NBHEOC and SJRH EOC and others</td>
<td>Various operational liaison as per the all-hazards response structure and as part of regular business cycle</td>
</tr>
<tr>
<td>MEDICAL LEAD</td>
<td>Serve as the point of contact and liaison with the Provincial Radiation Medical Advisor regarding medical issues</td>
</tr>
<tr>
<td>EMERGENCY RESPONSE LEAD(S)</td>
<td>Serve as point of contact and executive liaison with NBHEOC Management / Executive</td>
</tr>
</tbody>
</table>

### SAINT JOHN REGIONAL HOSPITAL EMERGENCY OPERATIONS CENTRES (SJRH EOC)

<table>
<thead>
<tr>
<th>Position</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Operations Centre Staffing and Management</td>
<td>As per Horizon Health (Saint John Area) all-hazards health emergency management plan</td>
</tr>
<tr>
<td>Liaisons to Horizon Health/SJRH EOC and NBHEOC and others</td>
<td>Various operational liaisons as per the all-hazards response structure and as part of regular business cycle</td>
</tr>
<tr>
<td>MEDICAL TEAM LEADER</td>
<td>Serve as the point of contact with the Provincial Radiation Medical Advisor and provides medical/clinical direction to SJRH EOC</td>
</tr>
<tr>
<td></td>
<td>Provides direction to Field Health Coordinator in both Command Posts</td>
</tr>
<tr>
<td>COMMAND CENTRE LEAD</td>
<td>Provides operational oversight and liaison with Health Services Coordinators and Medical Team Leader</td>
</tr>
<tr>
<td>ROLES</td>
<td>TASKS/FUNCTION</td>
</tr>
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</tr>
<tr>
<td><strong>FIELD COMMAND CENTRE</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **HEALTH SERVICES COODINATOR** 1 per site | • Participate as part of the command post and represent health services roles in the field to:  
  o coordinate operational activities  
  o relay tactical issues  
  o access and communicate information/expertise to and from SJRH EOC  
  • Communicate with NBHEOC via SJRH EOC (as needed)  
  • Oversees all Horizon Health’s health services roles on site (decontamination, bus)  
  • Coordinate with Command Post team members  
  • Ensure staff replacement when needed | Horizon Health Network |
| **NB-Emergency Medical Services (NB EMS) Operational Support Unit** | Participate as part of the Command Post team and represent NB EMS roles in the field to:  
  • coordinate operational activities  
  • relay tactical issues  
  • access and communicate information/expertise to and from ANB Emergency Operations Centre  
  • Coordinate with Health Services Coordinator and other Command Post team members (NB EMO, etc.) | Ambulance NB |

| **AMBULANCE NB EMERGENCY OPERATIONS CENTRE (ANB EOC)** | | |
| **EOC Staffing and Executive** | • As per ANB all-hazards heath emergency management plan | Ambulance NB |
| **Liaisons to Horizon Health/SJRH EOC and NBHEOC and others** | • Various operational liaisons as per the all-hazards response structure and as part of regular business cycle | Ambulance NB |
| **OPERATIONAL SUPPORT UNIT** | • Provides tactical and operational oversight and liaison with Health Services Coordinator, Medical Team Leader | Ambulance NB |
PART III

REFERENCE INFORMATION
16. GLOSSARY

<table>
<thead>
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<td>(in some cases modified to meet New Brunswick requirements)</td>
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All-Hazards Plan
A plan that examines the full range of threats and recognizes the common consequences of different impacts, allowing economies of scale to be achieved and risks to be addressed comprehensively. [5]

Alpha Particle
One of the five primary ionizing radiations, the others being beta particles, gamma-rays, x-rays, and neutrons. Alpha particles can be stopped by a thin layer of light material such as a sheet of paper, and cannot penetrate the outer, dead layer of skin. Therefore, they do not pose a hazard as long as they are outside the body. Protection from this radiation is directed to preventing, or at least minimizing, inhalation or ingestion of the radioactive material. Alpha particles are difficult to detect in an accidental situation because they penetrate only a few inches in air, and most “general purpose” detection instruments are poorly suited to this particular detection scheme. If radiation is detected at an incident scene, instruments should be brought in as quickly as possible to determine whether alpha emitting radioisotopes are present. [1]

Assembly Area
Designated area in which evacuees are gathered for processing and transport out of an emergency evacuation zone. [6]

Beta Particle
One of the five primary ionizing radiations, the others being alpha particles, gamma-rays, x-rays, and neutrons. They travel only a few feet in air and can be stopped by a thin sheet of aluminum. However, beta particles can penetrate the dead skin layer and, if present in large amounts or long period of time, cause skin burns. Protection from this radiation is directed toward washing the skin with mild soap and water and preventing, or at least minimizing, inhalation or ingestion of the radioactive material. Beta particles are easier to detect than alpha particles. While most “general purpose” detection instruments can detect beta particles, the instrument must be within a few yards of a sizeable source. Fortunately, the vast majority of beta-emitting radioisotopes release high-energy gamma rays that can be detected at distances of tens of yards. When radiation is detected at an incident scene, proper instruments should be brought in as quickly as possible to determine whether pure beta-emitting radioisotopes are present or not, followed in turn by alpha monitoring equipment. [1]

Background Radiation Levels
Radiation associated with natural sources or any other sources in the environment that are not amenable to control. This reading will serve as a reference point for PLGS Radiation...
Protection Technicians and NB Power Health Physicist to distinguish naturally occurring radiation from the radiation dose rate of the source being measured.

**Cold Zone**

This is the area outside of the warm and hot zones (see definitions below) where dose levels are acceptably low so as not to be considered hazardous. The cold zone may however be inside the Ingestion exposure zone where precautions are required to prevent the ingestion of radioactive material. PPE is not required.

**Command**

Authoritative direction of personnel and resources in the performance of tasks associated with emergency management. Laws, bylaws, constitutions, regulations or other legal instruments usually govern who commands whom. [5]

**Communication**

The action of imparting, conveying or exchanging ideas, knowledge or information. [5]

**Contamination**

The deposit of unwanted radioactive material on the surfaces of structures, areas, objects, or people (where it may be external or internal). External contamination occurs when radioactive material is outside of the body, such as on a person’s skin. Internal contamination occurs when radioactive material is taken into the body through breathing, eating, or drinking. For more information, see CDC fact sheet: Radioactive Contamination and Radiation Exposure online at <http://www.bt.cdc.gov/radiation/contamination.asp> [1]

**Control**

The direction of management and activities in an emergency. Authority for control is specified in emergency plans. It is allied with the processes of directing and assigning tasks to emergency workers, and assuming responsibility for failures. Many control functions affect multiple organizations. [5]

**Coordination**

Advancing systematically an analysis and exchange of information among principals who have, or may have, a need to know certain information to carry out specific incident management responsibilities. [5]

**Critical Incident Stress (CIS)**

The stress encountered during intense operational procedures (critical incidents). The effects of CIS can be quite dangerous and are caused by exposure to unusually intense emotional circumstances such as mortal danger, death or injury of others, etc. [6]

**Decontamination**

Removal of radioactive materials from people, materials, surfaces, food, or water. For people, external decontamination is done by removal of clothing and washing the hair and skin. Internal decontamination is a medical procedure. [1]

**Designated Funeral Home**

Where a radiation contaminated decedent must bypass the funeral home and be buried directly in a sealed metal casket from the ‘temporary morgue’, a funeral home(s) will be designated at the time of such an event, through consultation between the Office of the Chief Medical Officer of Health and the NB Funeral Director and Embalmers Association.
Deterministic Effects (non-stochastic effects)
Health effects that can be related directly to the radiation dose received (e.g., skin burn). The severity increases as the dose increases. A deterministic effect typically has a threshold below which the effect will not occur. See also Stochastic Effects. [1]

Dirty Bomb
Colloquial term for a device designed to spread radioactive material by detonating a bomb made with conventional explosives. It is intended not only to kill or injure from the initial blast, but also to spread radioactive contamination over as large an area as possible, thus the term "dirty." [2]

Dose
The amount of energy from radiation absorbed in (human) tissue. (Wood C.M., DePaolo F., Whitaker R.D., 2016)

Dose Rate
The amount of energy per unit time a person standing at that location would absorb. (Wood C.M., DePaolo F., Whitaker R.D., 2016)

Emergency
An abnormal situation which, to limit damage to persons, property or the environment, requires prompt and coordinated action beyond normal or routine procedures, resources and/or authority. [6]

Emergency Operations Centre (EOC)
A pre-designated facility staffed by an established, recognized team of people who are responsible for providing direction, coordination, communication and support during emergency operations. [6]

Emergency Planning Zone
A defined zone around a nuclear facility for which detailed planning and preparations are made in advance to ensure that appropriate protective measures can be applied in a timely and accurate manner. [3] See also Plume Exposure Emergency Planning Zone and Ingestion Exposure Emergency Planning Zone.

Emergency Shelter
A publicly operated facility providing temporary or transitional accommodation for individuals or families without access to their normal place of residence and who have no other immediate options. [6]

Emergency Worker
A person having specified duties as a worker in response to an emergency. Emergency Workers may include workers employed by registrants and licensees as well as personnel of responding organizations, such as police officers, firefighters, medical personnel, and drivers and crews of evacuation vehicles. (IAEA, 2015)

Evacuation
The rapid removal of people from an area to avoid or reduce high-level, short-term exposure to a hazard. [3] An organized and supervised temporary relocation of people from a neighbourhood or other area threatened or affected by a hazard to a place of safety. [6]
Evacuation Order
An official communication instructing the public to evacuate their homes and businesses. [6]

Evacuation Perimeter
The defined border of an emergency evacuation zone. [6]

Emergency Evacuation Zone
The area designated to be evacuated during an emergency situation. [6]

Exposure (irradiation)
Penetration of the body by radiation energy. Exposure to very large doses of radiation may cause death within a few days or months. Exposure to lower doses of radiation may lead to an increased risk of developing cancer or other adverse health effects later in life. [1]

External Contamination
External contamination occurs when radioactive material, in the form of dust, powder, or liquid, comes into contact with a person's skin, hair, or clothing. In other words, the contact is external to a person's body. People who are externally contaminated can become internally contaminated if radioactive material gets into their bodies.
<http://www.bt.cdc.gov/radiation/contamination.asp>

Extra-Mural Services
Acute, long term, rehabilitative or palliative care provided to a patient at the patient's place of residence, place of work or other place in a community. [5]

First Receiver
Those receiving casualties for treatment and not typically at the site of the incident, i.e. assistance is usually given at the first receiver's normal place of work for example, physicians and nurses working in hospital emergency departments.

First Responder
A trained and officially mandated responder involved in a response to the scene of an accident or an emergency event. Examples of first responders are police, firefighters, search and rescue, and emergency medical services personnel.

Gamma Rays
One of the five primary ionizing radiations, the others being alpha particles, beta particles, x-rays, and neutrons. Different from alpha and beta particles, gamma-rays are very similar to x-rays and pose an external radiation hazard. Gamma-rays are highly penetrating (up to tens of yards in air). Gamma rays also penetrate tissue farther than do beta or alpha particles. Gamma-rays are relatively easy to detect with commonly available radiation detection instruments. [1]

Genetic Effects
Hereditary effects (mutations) that can be passed on through reproduction because of changes in sperm or ova. See also Teratogenic Effects and Somatic Effects.

Hazard
A potential event or circumstances that present a threat to life, property and/or the environment. [5]
Health Physics
A scientific field that focuses on protection of humans and the environment from radiation. Health physics uses physics, biology, chemistry, statistics, and electronic instrumentation to help protect people from any potential hazards of radiation. [1]

Helper in an emergency.
Member of the public who willingly and voluntarily helps in the response to a nuclear or radiological emergency. (IAEA, 2015)

Hot Zone
This is the area inside the secured perimeter considered hazardous, with dose rate levels exceeding acceptable levels. PPE is required and dose levels closely monitored.

Ingestion Exposure Emergency Planning Zone
A defined zone around a nuclear facility for which detailed planning and preparations are made in advance to ensure that appropriate measures against exposure from ingestion of radioactive material can be applied in a timely and accurate manner. [3] In the case of the PLGS this is an 80 kilometre radius circle around the station.

Internal exposure
Exposure to radioactive material taken into the body. [2]

Internal Contamination
Internal contamination occurs when people swallow or breathe in radioactive materials, or when radioactive materials enter the body through an open wound or are absorbed through the skin. Some types of radioactive materials stay in the body and are deposited in different body organs. Other types are eliminated from the body in blood, sweat, urine, and feces. http://www.bt.cdc.gov/radiation/contamination.asp

Ionizing Radiation
Any radiation capable of displacing electrons from atoms, thereby producing ions. High doses of ionizing radiation may produce severe skin or tissue damage. See also Alpha Particle, Beta Particle, Gamma Ray, Neutron and X-Ray. [2]

Medical Officer of Health
Physician who serves to advise and lead a team of public health professionals on matters of public health importance: health protection, disease and injury prevention, surveillance and monitoring, health promotion, public health emergency preparedness and response, and population health assessment.

Mental Health
The relatively enduring psychological state of an individual functioning at a satisfactory level of emotional and behavioural adjustment

Mitigation
Activities undertaken in an attempt to eliminate or lessen either the probability of, or the severity and impact of, a potential incident by identifying hazards, vulnerabilities and risks that may affect operations and/or demand for services and resources. [6]
Monitoring
The process of determining the amount of ionizing radiation or radioactive contamination present. <http://orise.orau.gov/reacts/guide/definitions.htm>

Monitoring and Decontamination Centre (MDC)
Monitoring and Decontamination Centres are set up on either side of the 20km emergency evacuation zone to monitor evacuees for radiation and decontaminate where required.

NB Health Emergency Operations Centre (NBHEOC)
The strategic headquarters responsible for planning, directing, coordinating and aligning the Health System’s emergency response and recovery actions. Its role is to maximize the resources of the Health System, develop and maintain situational awareness across the complete Health System, and identify and resolve emerging issues early.

Neutron
One of the five primary ionizing radiations, the others being alpha particles, beta particles, gamma-rays, and x-rays. Neutrons are highly penetrating and are a radiation hazard at the instance of a nuclear detonation. In almost all other scenarios, it is unlikely for public health officials to encounter neutron radiation or contamination. Detection of neutrons requires specialized equipment. [1]

Non-Stochastic Effects (See Deterministic Effects)

Nuclear Emergency
Any event which has led or could lead to a radiological threat to public health and safety, property, and or the environment. [3]

Nuclear Energy
The heat energy produced by the process of nuclear fission within a nuclear reactor or by radioactive decay. [2]

Off-site
The area outside the boundary of a nuclear facility. The municipal, provincial and federal levels of government are responsible for off-site emergency planning, preparedness and response. [3]

On-site
The area inside the boundary of a nuclear facility, also called the exclusion area. The operators of nuclear facilities are responsible for on-site emergency planning, preparedness and response. [3]

Penetrating Radiation
Radiation that can penetrate the skin and reach internal organs and tissues. Photons (gamma rays and x-rays), neutrons, and protons are penetrating radiations. Alpha particles and all but extremely high-energy beta particles are not considered penetrating radiation.

Plume
A cloud of airborne radioactive material that is transported from a nuclear or radiological source in the direction of the prevailing wind. [3]
Plume Exposure Emergency Planning Zone
A defined zone around a nuclear facility for which detailed planning and preparations are made in advance to ensure that appropriate measures against exposure to a radioactive plume (such as sheltering and evacuation) can be applied in a timely and accurate manner.[3] In the case of the PLGS this is a 20 kilometre radius circle around the station.

Point Lepreau Emergency Classifications
- **Radiation Alert** - An event has occurred leading to higher than normal radiation levels that are limited to the Point Lepreau site.
- **Site Area Radiation Emergency** - An event that affects territory within the PLGS property perimeter only. Preparations shall be made to take protective actions off site, should they be required.
- **General Radiation Emergency** - An event involving an actual or substantial risk of release of radioactive material or radiation exposure that warrants taking urgent protective actions outside the boundary of the Point Lepreau site.

Preparedness
Activities, programs and systems developed and implemented prior to an incident to increase capacity to manage the effects of an incident as well as identifying resources that may be used should such an incident occur. [6]

Provincial Emergency Operations Centre (PEOC)
It is where provincial emergencies are managed. It consists of an operations room, a communications room, and an administration area as well as the necessary people, working accommodation and communications for the coordination and control of the provincial emergency response.

Provincial Mobile Communications Centre (PMCC)
Provincial Mobile Communication Centre - The coordinating agency used to handle 911 emergency calls in the Province. It receives calls regarding emergencies with public health and health system impacts and directs these calls appropriately to the Department of Health duty officer on-call, public health inspector on-call or Medical Officer of Health on-call.

Public Health
The art and science of protecting and improving community health by means of preventive medicine, health education, communicable disease control, and the application of social and sanitary sciences. [5]

Radiation
Energy moving in the form of particles or waves. Familiar radiations are heat, light, radio waves, and microwaves. Ionizing radiation is a very high-energy form of electromagnetic radiation. [1] When a person is exposed to radiation, the energy penetrates the body. For example, when a person has an x-ray. <http://www.bt.cdc.gov/radiation/contamination.asp>

Radiation Protection Technician
An employee of the Point Lepreau Generating Station trained in radiation safety and ensures that radiation doesn't pose a threat to the environment or individuals in the area. They measure and record the level of radiation emitted in accordance with established regulations and standards and advise accordingly. Some Radiation Protection Technicians
are green-qualified responders whose function is to manage potentially exposed or contaminated patients on-site at PLGS.

Radioactivity
The process of spontaneous transformation of the nucleus of an atom, generally with the emission of alpha or beta particles that are often accompanied by gamma rays. This process is referred to as decay or disintegration of an atom. [1]

Radiological or Radiologic
Related to radioactive materials or radiation. The radiological sciences focus on the measurement and effects of radiation. [1]

Radionuclide
An unstable and therefore radioactive form of a nuclide. [1]

Reception Centre
A location where evacuees are received, documented, assessed for personal needs and referred. [6]

Recovery
Post-emergency activities designed to restore essential services, and return or resume operations at a level that is acceptable to the organization, as well as to provide support to affected employees. [6]

Re-Entry
Operations directed toward the return of evacuees into the emergency evacuation zone. Re-entry begins with the decision and ends when all evacuees have been returned to their homes and/or businesses, as well as when all response resources used during the evacuation have been returned. [6]

Regional Emergency Action Committee (REAC)
The six REACs, each led by NB EMO Regional Emergency Management Coordinator, represent 12 Regional Service Commissions serving as vehicles through which Municipalities, Rural Communities and Local Service Districts plan, coordinate and pool resources on a regional basis in order to enable more effective responses to emergency situations. [6]

Resilience (Resiliency)
The measure of the rate of recovery from a stressful experience, reflecting the social capacity to absorb and recover from the occurrence of a hazardous event. [5]

Response
Activities that occur immediately before, during and directly after an incident to reduce and control the short-term, negative effects. [6]

Shelter-in-Place
The process of staying put and taking shelter rather than evacuating. [6]

Sievert (Sv)
The SI unit for a derived quantity called radiation dose equivalent. This relates the absorbed dose in human tissue to the effective biological damage of the radiation. Not all radiation has the same biological effect, even for the same amount of absorbed dose. Dose equivalent is
often expressed as millionths of a sievert, or micro-sieverts (μSv). One sievert is equivalent to 100 rem. For more information, see CDC Primer on Radiation Measurement <http://www.bt.cdc.gov/radiation/glossary.asp#primer> [1]

S.I. Units
The Système Internationale (or International System) of units and measurements. This system of units officially came into being in October 1960 and has been adopted by nearly all countries, although the amount of actual usage varies considerably. For more information, see CDC Primer on Radiation Measurement http://www.bt.cdc.gov/radiation/glossary.asp#primer [1]

Somatic Effects
Effects of radiation that are limited to the exposed person, as distinguished from genetic effects, which may also affect subsequent generations. See also Teratogenic Effects.[1]

Stochastic Effects
Health effects that occur on a random basis independent of the size of dose (e.g., cancer). The effect typically has no threshold and is based on probabilities, with the chances of seeing the effect increasing with dose. If it occurs, the severity of a stochastic effect is independent of the dose received. See also Deterministic Effect.[1]

Teratogenic Effect
Birth defects that are not passed on to future generations, caused by exposure to a toxin as a fetus. See also genetic effects, somatic effects.

Unified Command
An arrangement by which multiple agencies (e.g., fire, police, ambulance, etc.) respond jointly to an incident under a single common command structure with each agency retaining control of its own resources and command structure.[6]

Warm Zone
The area between the hot zone and the cold zone (see above for definitions) where contamination is being controlled and the evacuees are being processed. PPE is required for emergency workers.

Warning Order
An official communication warning the public of the possibility of an impending evacuation.[6]

Worried Well
People who are healthy but worried about becoming or being ill and may access health care services.
17. REFERENCES

Legislation and Policy

Federal


_____. Keeping Radiation Exposures and Doses “As Low as Reasonably Achievable (ALARA)”, G-129, Revision 1, October 2004.


Provincial


Fredericton, NB.


Local


Cooperation Agreement between Horizon Health Network (Horizon) and Point Lepreau Nuclear Generating Station (PLGS) dated 12 January 2011.

Point Lepreau Generating Station (PLGS) Documents

EP-1307 Protection Assistant Procedure – Accompanying a Patient to the Hospital

EP-78600-EQ95 Emergency Planning and environment Quarterly Check of the Saint John Regional Hospital and Station Ambulance Kits

EP-78600-M050 Shift Supervisor – Actions During a Medical Contingency

EP-78600-R020 Shift Supervisor – Actions During a Radiation Contingency

Standards


Best Practice


Centers for Disease Control and Prevention (CDC). *Glossary of Radiological Terms.* Available online from: [https://emergency.cdc.gov/radiation/glossary.asp](https://emergency.cdc.gov/radiation/glossary.asp)

Centers for Disease Control and Prevention (CDC). "Interim Guidelines for Hospital Response to Mass Casualties from a Radiological Incident" also contains valuable information and references. Available online at: [https://emergency.cdc.gov/radiation/pdf/masscasualtiesguidelines.pdf](https://emergency.cdc.gov/radiation/pdf/masscasualtiesguidelines.pdf)


Radiation Event Medical Management (REMM) website. [www.remm.nlm.gov](http://www.remm.nlm.gov)


Steele R, Sommer D, Nason, C. *How to set up a rubber area and/or rubber change area.* NB: Point Lepreau Generating Station, NB Power, 2005.

