Staunch Maple 2017 Critical Infrastructure Functional Exercise After Action Report

ISR Report 6079-01-04

Steven Dowker
International Safety Research

Prepared by:
International Safety Research
38 Colonnade Road North
Ottawa, Ontario
Canada K2E 7J6
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Presented to:

Exercise Program Manager
Defence Research and Development Canada
Centre for Security Science
222 Nepean Street,
Ottawa, ON, K1A 0K2

Prepared by:

International Safety Research
38 Colonnade Road North
Ottawa, Ontario
Canada K2E 7J6

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1.   INTRODUCTION

1.1   Background

Critical Infrastructure (CI) refers to the processes, systems, facilities, technologies, networks, assets and services essential to the health, safety, security or economic well-being of Canadians and the effective functioning of government. CI can be stand-alone, interconnected, and/or interdependent within and across provincial and territorial (P/T) and national borders. Disruptions of CI could result in the catastrophic loss of life, adverse economic effects and significant harm to public confidence [1].

Coordination between private CI owners/operators and all levels of government within Canada is crucial to emergency management planning as the privately owned CI within Canada may directly impact the government's ability to respond to major emergencies. The continued operation of CI assets is critical to the planning and tactical response operations of government agencies (e.g., use of cell towers, roads). CI stakeholders have expressed a need to better define the event management process during an emergency and require guidance on a coordinated approach that fosters the integration of the CI community within the municipal, provincial/territorial (P/T) and/or federal response.

A Functional Exercise (FX) was developed as the second phase of an exercise program supporting Defence Research and Development Canada's Centre for Security Science (DRDC CSS) and Public Safety Canada Critical Infrastructure (PS CI) Directorate. This FX was conducted as part of the Canadian Armed Forces (CAF) Exercise Staunch Maple 2017 (SM '17) which is a test of the Canadian Armed Forces plans and arrangements to support civilian authorities during a major event. The first phase of the DRDC-CSS exercise program was a Table Top Exercise (TTX) conducted in January 2017 at the Main Planning Conference (MPC) for the Staunch Maple Exercise.

1.2   Purpose

The purpose of this document is to present the findings of the CI FX that was conducted as subsidiary component to SM '17 from April 24th through April 26th.

1.3   Scope

This document outlines the key findings that emerged from exercise play and through evaluation discussions facilitated by exercise controllers. For each key finding, a short discussion is provided that explores the finding in further detail and how it relates to CI owner/operator response during emergency events. Along with the discussion component, a recommendation is provided outlining how best practices can be adopted/maintained, and/or how gaps can be closed. These findings and recommendations supported the further development of the CI Coordination Framework which is intended to provide guidance on how CI partners can be included in the event response of federal, P/T and local governments.

This document does not provide recommendations for individual organizations to

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improve their own response beyond the context of the CI Coordination Framework.

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2.   METHODOLOGY

2.1   Objectives

The main objective of this exercise was to collect information to support further development of the CI Coordination Framework aimed at better integrating the CI community in planning and response. This exercise achieved this goal by facilitating dialogue between multiple CI sectors, and between CI and federal government departments. Prior to this exercise, these channels of communication had not been explored in much detail and the simulated environment created for this exercise allowed these organizations to make new connections.

2.2   Participants

Eight privately owned CI organizations participated in the exercise while two associations observed information sources used during the exercise, but did not actively participate. These organizations were supported by simulated play from various federal governmental organizations who were participating in the larger SM '17 exercise; some of these organizations that participated in the CI FX are listed here. Input from other governmental organizations was simulated through SM '17.

CI Owners/operators:

- CN Railway (CN);
- Port of Halifax (POH);
- JD Irving;
- Irving Oil;
- Canadian Blood Services (CBS);
- Heritage Gas;
- Halifax Water; and
- Eastlink.

Associations:

- Canadian Animal Health Coalition; and
- Health Care Can.

Federal Government Departments:

- Government Operations Centre (GOC);
- Public Health Agency of Canada (PHAC);
- Transport Canada (TC);
- Innovation, Science and Economic Development Canada (ISED);
- Canada Border Services Canada (CBSA); and
- Virtual Risk Analysis Cell (VRAC).

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2.3   FX Format

2.3.1   General

The varying availability and geographical distribution of participating organizations required this FX to be developed and conducted remotely. Exercise controllers and participants were connected virtually through email and phone, with a trusted agent from each organization acting as the controller/evaluator for their organization. This single point of contact was the key to controlling and delivering this exercise remotely.

Remote exercise play allowed participating organizations to conduct internal emergency and/or business continuity planning at their own facilities and to test their emergency response plans. Many private CI owners/operators in Canada operate nationwide and the SM '17 CI FX included participants from New Brunswick (NB), Nova Scotia (NS), Ontario (ON), Alberta (AB) and Quebec (QC).

2.3.2   Exercise Delivery

The CI component of SM '17 was delivered to participants at varying time slots on each day of the exercise (Table 1: Participant Time-Slots). These time slots were determined based on the availability of each CI organization on April 24th through 26th. During each organization's allotted time, injects were sent by SimCell staff to trusted agents, imitating real-world events that would reasonably be expected to occur during a large scale emergency.

Table 1: Participant Time-Slots

Date	Exercise Time (Eastern)	Organizations	Post Participation Conference Call (Eastern)
Monday 24th	1200-1400	CN	1400-1500
		POH	
Tuesday 25th	1100-1300	CN	1300-1400
		POH	
	1200-1400	JD Irving	1400-1500
		Irving Oil	
	1300-1500	CBS	1500-1600
		Heritage Gas	
Wednesday 26th	1100-1300	Heritage Gas	1300-1400
		CBS	
	1200-1400	JD Irving	1400-1500
		Irving Oil	
	1300-1500	Halifax Water	1500-1600
		Eastlink	

Some of the CI participants were engaged directly by SM planners into the greater SM '17 exercise and were responsible for supporting the play of federal partners. TC for example directed the POH to increase the maritime security (MARSEC) level. This enabled TC to facilitate internal planning, and the POH and CN rail were also able to leverage this notification to drive their own planning on the first day of the exercise. Not all organizations had the opportunity to receive injects directly from the federal government, and other means for delivering key information to participants were used including email, news articles and the CI Gateway.

Some exercise artificialities had to be accepted by participants during the exercise due to more than one key players not participating in the exercise. A reference sheet (cheat sheet) was provided to participants with information on the SimCell developed for this exercise to alleviate the issues of key players not participating. It indicated how the SimCell could be contacted, and what capabilities it provided (e.g., simulating non-participating organizations). This reference sheet additionally contained instructions for accessing the various sources of exercise information. These sources of information are explained in more detail in Sections 2.3.2.1 through 2.3.2.3 below.

2.3.2.1   *Staunch Maple Media*

A web-portal was set up for the SM '17 exercise that provided participants with simulated media content. This content included text and video news. These news articles and segments were updated throughout the duration of the exercise. Participants were encouraged to monitor this simulated media site throughout the week regardless of their allotted time slots for play.

Figure 1 shows how the traditional media content was displayed on the media tool during SM '17.
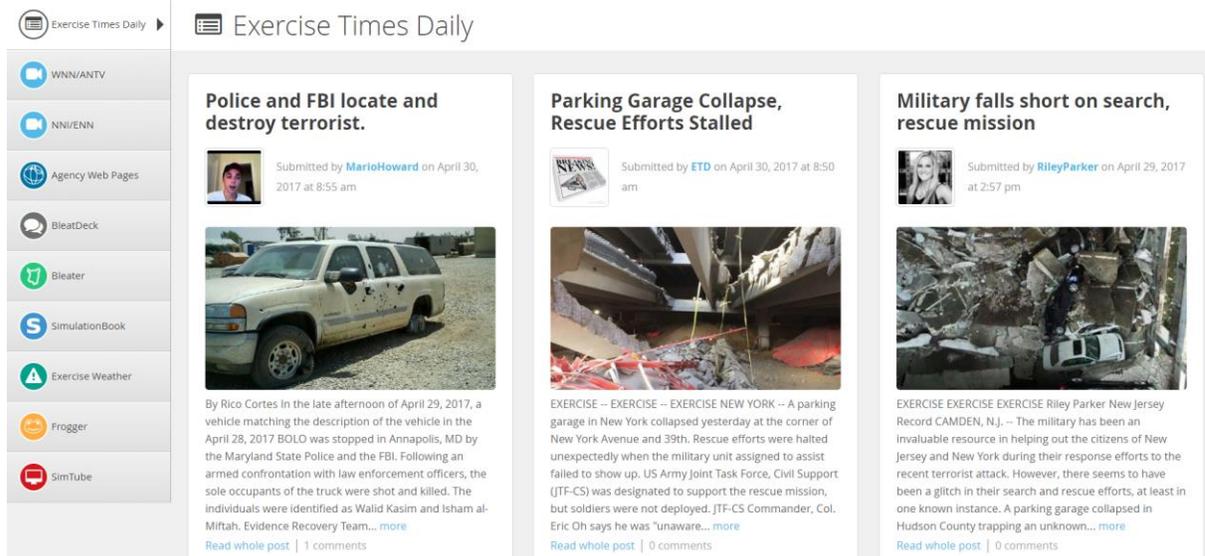

Figure 1: Staunch Maple Simulated Media

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2.3.2.2   CI Gateway

PS CI developed the CI Gateway as a means for private CI owners/operators to receive unclassified information products directly from government sources. Each CI owner/operator participating in the exercise was provided with login credentials for the FX[1]. Information products such as GOC situation reports (SitReps), TC transportation advisories, weather information, and various other documents were uploaded onto the gateway throughout the exercise and provided owners/operators with key information regarding the whole of government (WoG) response.

Figure 2 is a screenshot taken from the CI gateway during exercise play and shows how information was organized in the tool.

Document Library

	Type	Name	Category	Created
☐	📄	VRAC IMPACT ASSESSMENT SM17 APR27	Exercise, Geospatial Material, Impact Assessment	4/28/2017 9:50 AM
	📄	VRAC IMPACT ASSESSMENT HALIFAX INFRASTRUCTURE	Exercise, Geospatial Material	4/28/2017 9:50 AM
	📄	EX EX EX - UPDATE 18 NT01978-17 27 Apr 2017 - MISE À JOUR No 18 NT01978-17 27 avril 2017 EX EX EX	Exercise, Notification	4/27/2017 1:05 PM
	📄	EX EX EX - UPDATE 17 NT01978-17 27 Apr 2017 - MISE À JOUR No 17 NT01978-17 27 avril 2017 EX EX EX	Exercise, Notification	4/27/2017 11:34 AM
	📄	EX EX EX - UPDATE 16 NT01978-17 27 Apr 2017 - MISE À JOUR No 16 NT01978-17 27 avril 2017 EX EX EX	Exercise, Notification	4/27/2017 10:44 AM
	📄	EX EX EX - UPDATE 15 NT01978-17 27 Apr 2017 - MISE À JOUR No 15 NT01978-17 27 avril 2017 EX EX EX	Exercise, Notification	4/27/2017 10:26 AM
	📄	EX EX EX - UPDATE 14 NT01978-17 27 Apr 2017 - MISE À JOUR No 14 NT01978-17 27 avril 2017 EX EX EX	Exercise, Notification	4/27/2017 9:34 AM
	📄	EX EX EX - UPDATE 13 NT01978-17 27 Apr 2017 - MISE À JOUR No 13 NT01978-17 27 avril 2017 EX EX EX	Exercise, Notification	4/27/2017 8:26 AM
	📄	EX EX EX rise-set 27	Exercise, Weather	4/27/2017 8:12 AM
	📄	EX EX EX 27 April Scene Setter	Exercise, Weather	4/27/2017 8:12 AM

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➕ Add document

Figure 2: CI Gateway Dashboard

2.3.2.3   CI Specific Injects

Injects were developed by the exercise design team specifically for CI participants. These injects were provided to organizations participating in the CI component of the exercise through emails sent to trusted agents and were developed to replicate events that would occur during large scale emergency events. All of the CI injects were developed in such a way that they did not add to and/or modify the overarching SM 17 scenario.

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[1] These credentials are intended to remain valid after the FX, to provide a "take away" for the participating organizations.
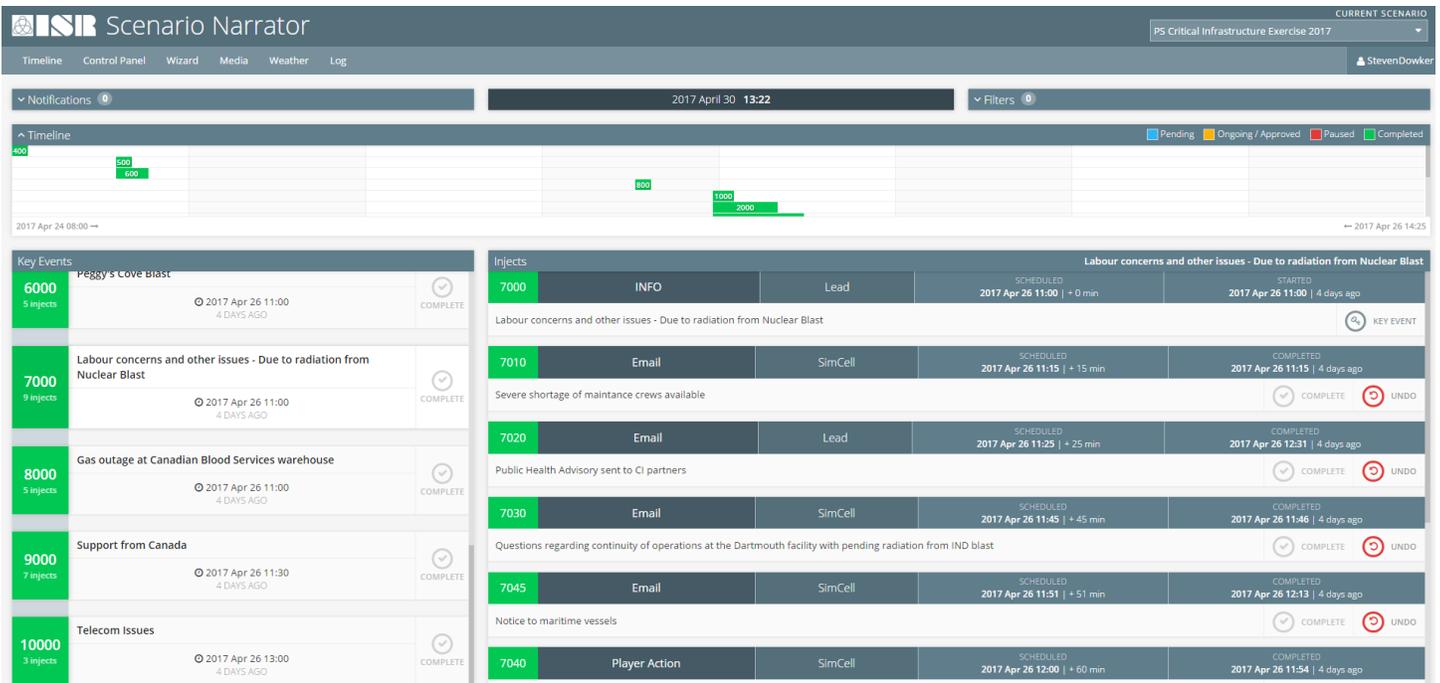
Figure 3: CI Inject Timeline

2.3.3 Exercise Control

Control for this exercise was conducted remotely at multiple SM '17 locations in Ottawa, Ontario. Controllers were co-located at 2 facilities to ensure successful delivery of this exercise including the ISR headquarters located at 38 Colonnade Road North, and the Government Operations Centre (GOC). Control staff at the ISR headquarters were responsible for control of the overall CI component of SM '17 exercise. The controller at the GOC acted as the liaison between the CI component and the greater SM '17 exercise, and provided CI FX controllers with situational awareness as to the government planning and response activities and general progress of the exercise.

A SimCell supported the delivery of injects to CI participants. Trusted agents in participating organizations were able to interact with the SimCell through email and/or phone when they needed to contact an organization that was not participating in the exercise. Figure 4 provides an organization chart outlining the control and SimCell structure.
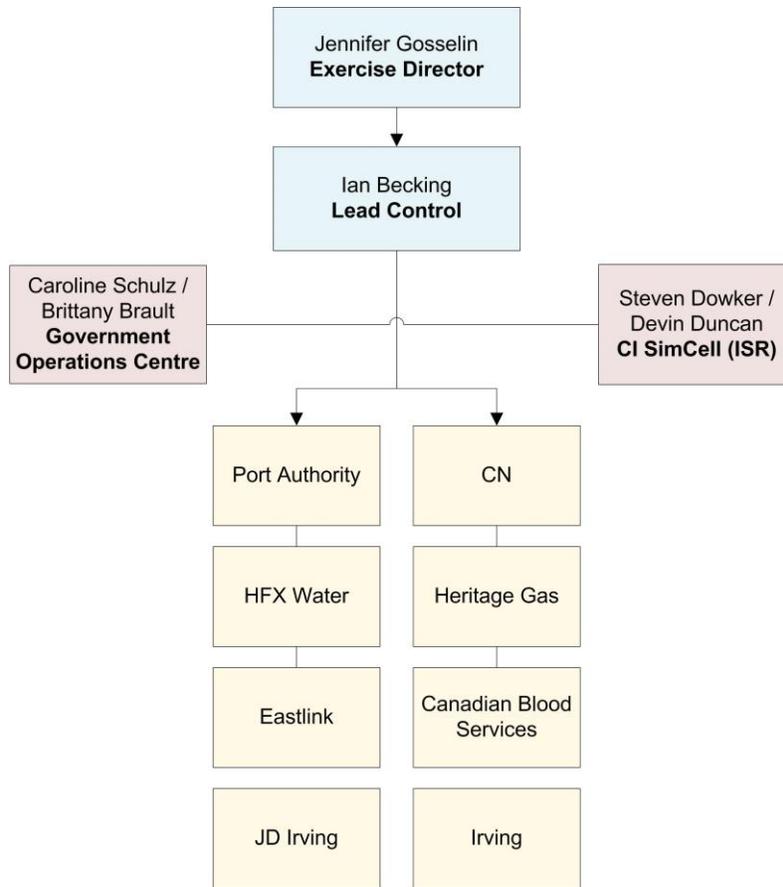
Figure 4: SM '17 CI Control Structure

2.4   Key Event Overview

2.4.1   Marine Security (MARSEC) Increases

On the first and second date of exercise play multiple CI organizations focused on a series of MARSEC level increases, and the planning requirements necessary when such an increase is ordered by TC. The MARSEC play promoted important discussions and information exchange between TC, the Port of Halifax, and CN rail that will be continued outside of the SM '17 realm, and in day-to-day operations at Canada's Ports.

2.4.2   US Detonation Response Issues

The detonation of an improvised nuclear device (IND) in the US prompted a series of discussions between organizations who participated on the second day. The detonation and resultant life/safety, health, and economic impacts presented CI participants with an opportunity to discuss "pre-planning" topics including the discussions of various "what if" scenarios if an event of this magnitude were to occur in Canada. This key event additionally included events within Canada that required the response of CI participants. Information was continuously uploaded to the various data sources discussed in Section 2.3.2 throughout the exercise.

2.4.3 Peggy's Cove Detonation

The main driver of CI play was the detonation of an IND at Peggy's Cove. This key event formed the basis of participant play on the third day of the exercise whereby emergency response activities were explored and interdependencies with other organizations (both CI and government) were discussed within each of the participating CI organizations. This key event also contained a number of injects focused on the health effects of radiation on the public, and on the field employees of various CI owners/operators. This highlighted an increased reliance on federal health agencies including PHAC and Health Canada (HC) to access specialized health information.

2.5 Data collection

2.5.1 After Action Reviews (AARs)

Qualitative information was collected during AAR sessions held with organizations immediately following their allocated exercise play. Participants were guided through a series of questions which explored notification, coordination, cross-sectoral interdependencies and the CI gateway.

The intent of having multiple AAR sessions with small groups of participants was that representatives from each organization had more time to discuss exercise activities with the exercise team. These hot washes were comprised of the same questions both days, which aimed to identify any new observations, gaps and/or best practices from the most recent scenario events provided to participants.

The results of these post participation calls are used in Section 3 below to support the findings and associated recommendations.

2.5.2 Participant feedback forms

Participant feedback forms were provided to each organization to be filled out by participants (provided in Annex A). Multiple questions to participants were designed to collect information from players regarding key observations during exercise play. An analysis of these feedback forms is provided in Section 3.8 below.

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3.   RESULTS

3.1   Overview

This section outlines the major findings from the exercise. Each finding is accompanied by a discussion section outlining the significance of the finding and how it relates to either event response, emergency planning and/or the SM '17 CI FX scenario. One or more recommendations support each finding which includes suggestions for how best practices can be adopted/maintained or how to rectify any gaps.

3.2   Notification

Finding #1: Private CI owners/operators are more likely to receive initial notification of emergency events from traditional and social media rather than from official government partners (e.g., sector leads, regulators).

Discussion: The amount of information that is shared on traditional and social media platforms, and the speed at which this information is shared following an emergency is increasing rapidly. Through AAR discussions it was identified by multiple CI owners/operators that they are more likely to receive initial notification of an emergency event from media sources, rather than from government partners.

These CI owners/operators indicated that they are conducting social media monitoring as part of day-to-day operations and in some cases, this monitoring is picking up notification of emergency events before formal notification is received from government organizations. This is not to say that notification of some emergency events is never received from government departments but it is recognized that these departments must analyze and verify information before releasing any official products. This leads to a delay in the release of information when compared against traditional and social media, as they are largely comprised of unfiltered information posted in near-real time.

Recommendation:

Organizations need to clearly define and differentiate how they will use information from various sources within their emergency plans. CI owners/operators may be able to utilize the real-time information provided by traditional/social media for immediate SA gathering, however this information must be cross referenced and verified and should not be relied on for informing emergency planning. The information products that are released by government partners will generally be verified and more accurate, and can help in informing emergency planning of owners/operators.

3.3   Information Sharing

Finding #2: The response priorities developed by CI owners/operators and government agencies during emergency response planning may not consider the needs of other upstream organizations (e.g., regulators, emergency management organizations, higher levels of government, etc.) and downstream organizations (e.g., customers, lower levels of government, etc.).

Discussion: Government agencies and private CI owners/operators develop priorities as part of their internal emergency response planning. These priorities are the most critical tasks that an organization must complete during an emergency and may be modified as the situation dictates. It was identified during AAR discussions that what one organization may consider to be a low priority, may be the highest priority to another organization and may impede the ability of that organization to conduct their own emergency operations.

A telecom company for example may prioritize the resumption of services to key government buildings and first responder facilities, leaving other organizations without communications capabilities for an extended period of time during their response. By promoting organizations to share information with other responding agencies, whether government or privately owned, regarding their expected priorities, CI owners/operators may be able to identify key service deficiencies before they occur and develop preliminary mitigation measures. This speaks to the fundamental objective of the CI Coordination Framework and CI community integration into event response of government organizations which aims to increase the sharing of this emergency planning information between CI and government partners.

Recommendation:

1. A mechanism for sharing priorities amongst responding organizations during emergency response is required. PS CI should consult with CI owners/operators and government to explore method(s) for sharing this type of information and should work to implement this mechanism across Canada.
2. This should be investigated in future exercises, with the participation of governmental emergency management organizations at all levels of government who would be expected to perform many of these coordination tasks in a real emergency.

3.4   Coordination

Finding #3: Private CI owners/operators that operate nationally or globally bring a different perspective to response planning/operations than organizations who operate in a small geographical region.

Discussion: Emergency events can have effects over a widespread geographical region, even when the initial impacts occur in a single jurisdiction. Through AAR discussions it was identified that resources damaged and/or disabled as a result of an emergency in a single jurisdiction may have knock-on effects in other cities, provinces and/or countries and the planning for these types of events is complex. Not only do the needs of the organization in the affected jurisdiction(s) need to be handled, but the continuity of critical services to secondary organizations in non-affected regions needs to be planned for.

Although the planning process during emergencies for these types of organizations is complex when an emergency occurs, the resources (people, equipment, products) that they can engage from other regions can support the response.

Recommendation:

1. Include CI owners/operators in national-level emergency planning. This would allow owners/operators who operate nationally to provide input to government planning and to share their best practices used in their own national planning.
2. PS CI should provide briefings at conferences at the federal, provincial and territorial levels to assist with increasing the level of participation of CI owners/operators in government emergency planning.

Finding #4: Business and Trade Associations maintain administrative datasheets/lists outlining key information about their membership. It was indicated that in some cases within a single association, there may be multiple lists, each containing similar, or duplicated information.

Discussion: During post-exercise discussions with the associations who participated as observers, it was determined that there are a wide variety of lists that currently exist outlining details on CI organizations, facilities, the members of CI associations, and other key information. This is particularly true within sectors like the Agri-Food sector where there are multiple types of producers, primary and secondary processors and distributors of agri-food products. This has made these administrative lists difficult for the associations to track and is causing confusion as to which ones are the most up-to-date and accurate, specifically during emergency operations this uncertainty could be costly when quick decision making is critical.

Recommendation:

The creation of a "CI directory" by each Sector Lead could act as a central repository for key information for CI owners/operators throughout Canada. This list would ideally contain:

- Name of the CI organization;
- Service area(s);
- Locations of key assets (e.g., refineries, power plants, major transportation hubs etc.); and
- Key contact information.

It is recommended that this list is developed as a secure database to ensure only authorized users can access the information. A single custodian would be required for this list, and PS CI has an appropriate mandate and resources, which would make it the best candidate to retain these databases.

3.5   Emergency Planning

Finding #5: As a result of exercise play, some organizations identified areas of their emergency plans that require immediate and long-term updating and/or modification.

Discussion: Multiple participants made operational decisions during their planning which had not yet been considered in their emergency plans. The shelter in place advisory released as part of the SM '17 exercise covered an extremely large portion of NS and hindered the ability of most organizations to activate field crews. Requests for

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service came from other CI organizations, however as employees were instructed to shelter in place, it was difficult to send them into the field.

This discussion further raised questions regarding the proper Personal Protective Equipment (PPE) that should be worn by employees to protect themselves from radiation. Of the participating CI owners/operators, most had little to no knowledge of what PPE was required for an event of this type and what dosage an employee could take. Similarly, most of the emergency plans of the CI owners/operators did not make considerations for PPE specific to radiological events, however some knew of where to get subject matter expertise (e.g., Point Lepreau Generating Station, PHAC).

Most of the CI owners/operators indicated that they would depend on the provincial and/or federal governments to provide them with specialized training, equipment, and expertise to support their operations in this type of emergency. For example, during one of the AAR sessions with Heritage Gas, CBS, CAHC and Irving Oil, they indicated that they would be looking to PHAC, HC and/or CFIA for information regarding the major radiation health effects associated with an event of this type, worker safety and PPE requirements, security information and effects on agriculture and food. This heavy reliance on federal entities highlights the importance of effective information exchange between all levels of government, and CI owners/operators.

The exercise scenario affected a large portion of the NE seaboard of North America, prompting these owners/operators to consider the needs of their organization in the case of a multi-jurisdictional emergency crossing multiple provincial and national borders. Some participants stated that their plans identify key secondary and tertiary locations for conducting work if a major city is severely impacted by an emergency, however these locations were included in the same region and were forced to follow the same shelter in place advisory issued as part of the scenario, and therefore were not suitable as a temporary work site. While a nuclear detonation may not need to be part of their existing plans, it was recognized that many natural disasters occur at the same scales (e.g., hurricanes), and the ability to adapt must be included in emergency plans.

The underlying objective of the CI Coordination Framework is to identify how CI can be included into the event response of all levels of government, and if CI owners/operators know the information and resources that they may require for various events, they can conduct better preparedness planning and establish contact with the various government departments as required.

Recommendation:

1. CI stakeholders need to consider in their plans how reach-back support can be managed for emergencies that exceed the capabilities and expertise of local organizations.

2. Further opportunities should be provided to CI owners/operators for joint exercising as each exercise will identify further areas within their plans that require refining.

3. The CI Coordination Framework should be updated to include guidance on the process for acquiring reach-back support, both before an emergency and during response operations.

3.6   Other

Finding #6: CI partners successfully accessed the CI Gateway for situational awareness information (i.e., GOC situational reports, notifications) during the exercise, however this information conflicted with that released by other government sources.

Discussion: Conflicting information is a reality in any emergency and this was evident during the SM' 17 CI exercise. Some participants indicated that the information from government sources posted on the CI Gateway was conflicting with information released directly to CI participants from other government agencies.

For example, during the exercise, NS EMO (simulated) emailed out a notification which indicated a shelter in place perimeter of 200km based on information received by the Federal Nuclear Emergency Plan (FNEP) Technical Assessment Group (TAG). The FNEP TAG then updated the advisory to 30km around the site of the blast and 300km downwind, however subsequent instructions from NS EMO and SitReps from the GOC continued to include the initial 200km radius for a significant period of time and were not updated to the new FNEP TAG information. While this may have been an artificially brought on by SM17, it does point to the challenges in managing information during large, multi-agency emergencies.

The volume of information being shared during emergencies is extremely large and official messaging from the government is essential for CI owners/operators as it may significantly impact their planning priorities and their capability to conduct certain tasks. The verification of information that is received from any source must be done by each organization, and clarifications must be sought for information such as the shelter in place advisories that conflict between the official sources.

Recommendation:

The CI Coordination Framework should contain a section that outlines what may lead to conflicting information, and some high level strategies that CI owners/operators can use to seek clarification when there are major discrepancies.

Finding #7: Some participants were using the CI Gateway tool for the first time, and experienced difficulty in navigating and extracting the key information that was uploaded.

Discussion: For some of the CI participants, this exercise was their first time seeing and interacting with the CI gateway. Some of the participants experienced difficulty in navigating the site which lead to limited information being pulled from the tool. By not knowing where information was posted, and how to view or download this information, some organizations had a low overall situational awareness of the scenario and exercise events. This limited their ability to conduct effective emergency planning and to stay connected to the overall SM '17 scenario.

Recommendation:

1. Training should be provided to all CI owners/operators who are expected to use the CI Gateway. This training should discuss the general functionality of the tool

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and how the information is organized. This will ensure that CI owners/operators are able to utilize the tool to its full potential and to be fully plugged into the emergency response actions of all organizations involved in response. This training should ideally be provided in advance of exercises involving CI owners/operators.

2. The CI Gateway should be included in future exercises, following the provision of the aforementioned training to potential exercise participants.

3.7   Exercise design

Finding #8: Participants indicated that the exercise would have benefitted from a larger number of participating organizations.

Discussion: A larger number of participating organizations would have allowed more interdependencies to be explored. The participation of key organizations that exercise participants would contact would have provided a higher level of realism to the exercise and would have allowed more in-depth information sharing to occur. In particular, many of the CI owners/operators work closely with provincial organizations who were not participating in this exercise. Further, most CI Sector Leads from the federal government that would have been expected to interact with the CI owners/operators were either not participating or had very limited play.

It was identified that earlier invites could have led to greater participation from other organizations.

Recommendation:

In future exercises, invitations should be sent out at least 4 months prior to the exercise, and the participants and their scope of play should be finalized at the Initial Planning Conference. This will allow participating organizations sufficient time to arrange their schedules and obtain necessary approvals to participate in the exercise.

3.8   Participant Feedback Forms

3.8.1 Overview

6 participants completed the participant feedback form; representing the following organizations:

- Canadian Blood Services;
- Heritage Gas;
- ISED; and
- Canadian Animal Health Coalition.

Given the limited response, the findings presented in this section are not paired with recommendations.

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3.8.2 Strengths in the integration of CI into emergency management activities

Finding #9: The exercise provided an opportunity for CI owners/operators to connect with other CI owners/operators, as well as government departments. The exercise also facilitated learning within each organization regarding the emergency response processes of various departments who would respond to an event of this type.

Discussion: When asked to identify the top three strengths in the integration of the CI community into emergency management activities (e.g., response, coordination, information sharing etc.) participants listed the following:

- Participants identified that coordination between CI organizations participating in the exercise was successful;
- The CI organizations who participated in the exercise were experienced in much of their own emergency response plans and processes;
- Participants found that during this exercise, there was improved information sharing amongst CI and between CI and government;
- Some participants indicated an improved understanding of national response plans and processes; and
- Participants found that this exercise improved upon the involvement of CI in government exercises.

The identification of these strengths indicates that by participating in this exercise CI participants gained a better understanding of how their response activities affect those of other organizations (and vice versa).

3.8.3 Areas for improvement in the integration of CI into EM activities

Finding #10: Additional joint training and planning is required to enable a greater level of understanding of the Emergency Plans of other CI and/or government agencies.

Discussion: Participants were asked to identify the top three areas for improvement in the integration of the CI community in emergency management activities (e.g., response, coordination, information sharing). The following responses were provided indicating the need for additional training and planning:

- A better understanding of the national / cross provincial response processes as they currently stand is required;
- A better understanding of the tools available for supporting emergency response is required, including capabilities/responsibilities of government, CI owners/operators and industry;
- An improved understanding of the role that CI owners/operators are to play in emergency planning and response is required; and
- Emergency supplies at work sites must be managed better including PPE and the training required for its use.

Finding #11: Communications and information sharing are aspects of emergency response that require a high level of planning in both government departments and CI

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owners/operators.

Discussion: The communications and information sharing theme was identified through the following responses provided by exercise participants:

- A greater ability to share CI specific information amongst response partners is required;
- A more consistent emergency language needs to be used during communications, and all acronyms need to be defined in all communications; and
- A means of communicating on backup systems needs to be developed in the event that main lines of communication are unavailable.

These answers indicate that participants require a more detailed understanding of how their individual organizations fit into the larger response, and where they are to provide information with respect to their CI assets. Additionally, it was identified that the language used in emergency communications is not consistent between F/P/T government and CI owners/operators.

3.8.4 Awareness of cross sector issues

Finding #12: The exercise successfully highlighted the importance of interdependencies between CI sectors, and between CI organizations and government departments at all levels.

Discussion: 75% of participants indicated that their level of awareness of the dependencies and interdependencies that exist between CI sectors, and between CI organizations and government departments increased as a result of this exercise. This was one of the core goals of PS CI, and was successful, providing participants with "food for thought" for their ongoing emergency management planning.

3.8.5 Assessment of exercise design and conduct

Participants were provided with a series of statements and an associated Likert scale and were asked to rate their assessment of the exercise relative to each of the statements. A rating of 1 indicated "strongly disagree" while a rating of 5 indicated "strongly agree". The table below provides the average rating given to each statement from the feedback forms received from participants.

Table 2: Average Likert rating for Exercise Design

Assessment Factor	Average Rating out of 5
1. The exercise was well structured and organized.	4.5
2. The exercise scenario was plausible and realistic.	4.5
3. The exercise was useful and beneficial to my organization.	5
4. The exercise documentation provided to assist in preparing for and participating in the exercise was useful.	4.5
5. Participation in the exercise was appropriate for someone in my position.	5
6. The participants included the right people in terms of level and mix of disciplines.	3

The results of most statements were positive. All but one received an average score of 4.5 or above. This is indicative of what was discussed during the hot wash sessions.

Finding #13: The exercise provided a high-quality opportunity to connect multiple CI sectors with government departments.

Discussion: Based on the results of the exercise design rating questions, it is apparent that participants felt that the exercise was extremely valuable for their organizations (scored an average of 5/5). When these results are compared against the qualitative feedback provided during AAR sessions, it can be seen that most of the participating organizations (government and CI owners/operators) drew a myriad of benefits from the increased communications between the private and public sectors.

Finding #14: Participants indicated that this exercise would have benefitted from the participation of additional CI owners/operators

Discussion: Only 60% of participants in the participant feedback survey felt that the exercise included the right people in terms of their level and mix of disciplines. This lower average rating is not surprising due to the limited participation (due to various reasons) from Halifax Regional Municipality (HRM) and the Province of Nova Scotia Emergency Management Office (NS EMO). During exercise hot wash sessions, many of the participants indicated that they would be closely linked to HRM and the NS EMO throughout their response to provide and receive situational information. By not having HRM and NS EMO involved, most of the participants lost key links in their response chain and had to find alternative means for accessing information and coordinating their response.

3.8.6 Results without Findings

The feedback form asked participants to list any observations that may have not been seen by exercise evaluators. Based on the feedback forms received, the following responses were provided:

Canadian Blood Services:

- Evaluators would not have seen the tremendous national organizations/response that CBS can call upon in times of crisis.

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Heritage Gas:

- Most CI owners have established emergency response and/or business continuity plans. Over time, familiarity with these plans throughout the participants would be beneficial.

Canadian Animal Health Coalition:

- Wondered why the plume heading through upstate NY in the US didn't trigger an Ontario and Quebec food CI response.

Comments provided by participants for the last question of the feedback form, "please provide any recommendations on how future exercises could be improved or enhanced" mainly consisted of the inclusion of more partners.

All respondents indicated that they would like to participate in future exercises.

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4.   RECOMMENDATIONS

4.1   Recommendations Summary

The recommendations in this report are structured to provide a basis for improvement planning. Table 3 outlines the findings with associated recommendations, and Table 4 provides the key findings drawn from the participant feedback surveys that are not associated with recommendations due to a low number of respondents.

Table 3: Finding / Recommendation Summary

Finding No.	Description	Action	Resp. Org.
Finding 1	Private CI owners/operators are more likely to receive initial notification of emergency events from traditional and social media rather than from official government partners (e.g., sector leads, regulators).	Define in emergency plans the ways in which organizations will use information gathered from social media and traditional news media versus information received from government departments.	CI Orgs, Gov't Dept's
Finding 2	The response priorities developed by CI owners/operators and government agencies during emergency response planning may not consider needs of other upstream organizations (regulators, emergency response organization, higher levels of government etc.) and downstream organizations (customers, lower levels of government).	Consult with CI owners/operators and government departments to investigate what types of mechanisms could be developed for sharing priorities amongst all responding organizations during an emergency.	PS CI
		Test how mechanism(s) identified in the recommendation above could be used, in future exercises, with the participation of governmental emergency management organizations who would be expected to perform these coordination tasks in a real emergency.	PS CI, CI Orgs
Finding 3	Private CI owners/operators that operate nationally or bi-nationally bring a different perspective to response	Increase participation of CI owners/operators in government workshops and conferences focusing on emergency management planning.	PS CI

Finding No.	Description	Action	Resp. Org.
	planning/operations than organizations who operate in a small geographical region.	Provide briefings to government departments at conferences with federal, provincial and territorial level government regarding the importance of private CI owners/operators and the capabilities they can provide during emergency planning and response.	PS CI
Finding 4	There are too many lists outlining information on various association members' assets, services and key contacts and multiple lists are difficult for associations to track.	Create CI directory in the form of a secure database for each sector to act as central repository for key CI owner/operator information (name of key contact, locations of assets if available, service areas etc.).	CI Sector Leads, PS CI
Finding 5	As a result of exercise play, some organizations identified areas of their emergency plans that require immediate and long-term updating and/or modification.	CI owners/operators and federal CI Sector Leads need to update their plans to consider how reach-back support can be managed for emergencies that exceed the capabilities and expertise of local organizations.	All organizations
		The CI Coordination Framework should be updated to include guidance on reach-back support.	PS CI
		Plan and execute further exercises allowing CI owners/operators to jointly exercise with each other, and with F/P/M government(s).	PS CI, Gov't Depts CI Orgs
Finding 6	CI partners successfully accessed the CI Gateway for information during the exercise, however this information conflicted with information released by other government sources.	Include high level strategies for deconflicting and verifying information in CI Coordination Framework.	PS CI
Finding 7	Some participants were using the CI Gateway tool for the first time, and experienced difficulty in navigating and extracting the key information that was uploaded.	Provide training to organizations/ departments expected to use the CI Gateway tool.	PS CI
		Include the CI Gateway in future exercises for participants who have been provided with basic user training.	PS CI

Finding No.	Description	Action	Resp. Org.
Finding 8	Participants indicated that the exercise would have benefitted from a larger number of participating organizations.	In future exercises, send invites at least 4 months prior to execution and establish level of participation for each organization at the IPC to ensure sufficient planning time for exercises	PS CI

Table 4: Findings without Recommendations

Finding No.	Description
Finding 9	The exercise provided an opportunity for CI owners/operators to connect with other CI owners/operators, as well as government departments. The exercise also facilitated learning within each organization regarding the emergency response processes of various departments who would respond to an event of this type.
Finding 10	Additional joint training and planning is required to enable a greater level of understanding of the Emergency Plans of other CI and/or government agencies.
Finding 11	Communications and information sharing are aspects of emergency response that require a high level of planning in both government departments and CI owners/operators.
Finding 12	The exercise successfully highlighted the importance of interdependencies between CI sectors, and between CI organizations and government departments at all levels.
Finding 13	The exercise provided a high-quality opportunity to connect multiple CI sectors with government departments.
Finding 14	Participants indicated that this exercise would have benefitted from the participation of additional CI owners/operators

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5.   CONCLUSION

This CI FX conducted within the SM '17 exercise was an invaluable opportunity for PS CI, CI owners/operators, and government departments to participate in a joint exercise. Key interdependencies were identified which when resolved, will allow these organizations to conduct a more efficient and effective emergency response.

The CI owners/operators that participated in this exercise took away crucial lessons learned regarding their internal emergency management and business continuity programs. Some participants described the exercise scenario as a "reality check" as some of the events prompted discussions about things previously unconsidered all together and/or identified a lack of knowledge in specific area(s) (e.g., PPE for radiological events).

The CI Gateway was an invaluable tool for most of the participants during the exercise, however further refinement of the tool is required to make it a more user-friendly application and additional user training is required for newer users of the tool. Participants were able to gather an extremely large amount of information with respect to the WoG response which was previously unavailable to CI owners/operators. By accessing this information, owners/operators were able to better understand what was being done at a national level and could identify where their response efforts may need to be focused and where their services could be offered to support government response.

Among the key lessons learned from this exercise is that platforms for connecting CI owners/operators and government departments need to continue to be offered so that steps towards joint emergency planning keep being made. This exercise was the first exercise developed to focus on the relationship between CI owners/operators and government during emergency response, and the momentum that was created needs to be carried on into future planning. Future exercises and workshops should be developed to the same effect as this exercise so that additional CI organizations and sectors can be engaged to keep exploring the numerous interdependencies that exist.

PS CI will move forward in its CI program with confidence knowing that CI owners/operators and government departments are eager to further explore how each can support the other, and how organizations across all levels of government and all CI sectors can be included in the event planning and event response process. The level of coordination between CI and government will continue to grow as more high quality opportunities for joint planning and exercising are provided.

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REFERENCES

[1]   Public Safety Canada, <u>National Strategy for Critical Infrastructure</u>, 2009.

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ANNEX A.   PARTICIPANT FEEDBACK FORM

Name: _____   **Title:**_____

Email:_____   **Phone:**_____

Organization:_____

Part I: Observations

1. Based on the functional exercise, list the **top three strengths** in the integration of the Critical Infrastructure (CI) community in emergency management activities (i.e. response, coordination, information sharing).

   1. _____
   2. _____
   3. _____

2. Based on the functional exercise, list the **top three areas for improvement** in the integration of the CI community in emergency management activities (i.e. response, coordination, information sharing).

   1. _____
   2. _____
   3. _____

3. Did this exercise help increase your awareness of cross-sector issues and/or the interdependencies & dependencies of your organization on other sectors?

   _____
   _____
   _____

4. Is there anything you saw in the exercise that the evaluator(s) might not have been able to observe and record?

   _____
   _____
   _____

Part II: Assessment of Exercise Design and Conduct

Please rate, on a scale of 1 to 5, your overall assessment of the exercise relative to the statements provided below, with 1 indicating strong disagreement with the statement and 5 indicating strong agreement.

Assessment Factor	Strongly Disagree			Strongly Agree	
	1	**2**	**3**	**4**	**5**
The exercise was well structured and organized.					
The exercise scenario was plausible and realistic.					
The exercise was useful and beneficial to my organization.					
The exercise documentation provided to assist in preparing for and participating in the exercise was useful.					
Participation in the exercise was appropriate for someone in my position.					
The participants included the right people in terms of level and mix of disciplines.					

Please provide any recommendations on how future exercises could be improved or enhanced.

_____

_____

_____

Would you like to participate in future exercises?

☐ Yes   ☐ No

** Please return your completed survey to **Caroline.Schulz@canada.ca**

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13. ABSTRACT/RÉSUMÉ (When available in the document, the French version of the abstract must be included here.)

This document outlines the key findings that emerged from exercise play and through evaluation discussions facilitated by exercise controllers. For each key finding, a short discussion is provided that explores the finding in further detail and how it relates to CI owner/operator response during emergency events. Along with the discussion component, a recommendation is provided outlining how best practices can be adopted/maintained, and/or how gaps can be closed. These findings and recommendations supported the further development of the CI Coordination Framework which is intended to provide guidance on how CI partners can be included in the event response of federal, P/T and local governments.

This document does not provide recommendations for individual organizations to improve their own response beyond the context of the CI Coordination Framework.

Le présent document énonce les principales conclusions à tirer du déroulement de l'exercice et des discussions d'évaluation animées par les contrôleurs d'exercice. Pour chacune de ces conclusions, vous trouverez une brève description fournissant davantage de détails et précisant le lien avec l'intervention de propriétaires ou de gestionnaires d'infrastructures essentielles en situation d'urgence. Outre cette description, une recommandation est formulée pour indiquer comment adopter et conserver des pratiques exemplaires et corriger les lacunes. Ces conclusions et ces recommandations viennent appuyer le perfectionnement du cadre de coordination qui vise à fournir des orientations sur la façon dont les partenaires des infrastructures essentielles peuvent participer aux interventions des gouvernements fédéral, provinciaux, territoriaux et des autorités locales en cas d'incident.

Le présent document ne fournit aucune recommandation à une organisation en particulier pour améliorer ses propres interventions en dehors du contexte du cadre de coordination des infrastructures essentielles.