Continuous Improvement for Federal Event Response (CIFER)

Decision support for the development of the program's Concept of Operations (ConOps)

Shaye Friesen
Tara Logue
Vijitharan Vivekanandarajah
DRDC – Centre for Security Science

Jim Legere
Contractor
Presidia Security

Shelley Kelsey
Contractor
CAE Canada

Prepared For:
Director General
Government Operations Centre

Defence Research and Development Canada

Scientific Report
DRDC-RDDC-2016-R160
August 2016

Abstract

The Continuous Improvement of Federal Event Response (CIFER) project is a Public Safety (PS) Government Operations Centre (GOC)-led effort, with oversight by a permanent working group (WG) of key stakeholders comprised of representatives from across the federal community. This program was developed in part to meet mandated legislative requirements under the *Emergency Management Act* (2007). The aim of the program is to ensure that observations, insights and lessons captured in after action reports / after incident reports (AARs/AIRs) from exercises and real operations are used systematically to improve prevention, preparedness and response to future operations or events. For the past six months, Defence Research and Development Canada's Centre for Security Science (DRDC CSS) has provided technical advice and analytical support to the CIFER Secretariat in support of the development of a Concept of Operations (ConOps). Specifically, DRDC assisted in managing two CIFER WG Workshops, conducted an environmental scan, developed a taxonomy and provided advice on a risk-informed methodology for prioritizing, selecting and following through on recommendations. The project team also examined standardized templates for the submission of recommendations, tracking and reporting mechanisms for the Directors General Emergency Response Committee (DG ERC). The aim of this Scientific Report (SR) is to describe the advice, guidance and decision analytic support that DRDC CSS provided to PS, which is primarily meant to better support the development of the program's Concept of Operations (ConOps).

Significance to Defence and Security

Public Safety (PS) Canada was created in 2003 to ensure coordination across all federal departments and agencies responsible for national security and the safety of Canadians. PS also works with other levels of government, first responders, community groups, the private sector and other nations, on national security, border strategies, countering crime and emergency management issues and other safety and security initiatives. They ensure that there is a coordinated, integrated approach to emergency management, law enforcement, corrections, crime prevention and border security. The purpose of the CIFER program is to harness the collective strength of the federal response community to drive continuous improvement and ensure that lessons learned and best practices are used to systematically and effectively improve future operations. It has a direct and unequivocal impact on the quality and coordination of safety and security services to Canadians.

Résumé

Le Projet d'amélioration continue de l'intervention fédérale en cas d'incident (ACIFI) est un effort entrepris par le Centre des opérations du gouvernement (COG) de Sécurité publique (SP) Canada, sous la supervision d'un groupe de travail (GT) permanent d'intervenants clés composé de représentants de l'ensemble de la communauté fédérale. Le programme a été élaboré en partie pour répondre aux exigences législatives prescrites aux termes de la *Loi sur la gestion des urgences* (2007). Le programme a pour but de veiller à ce que les observations, idées et leçons tirées des rapports après action / rapports après incident (RAA/RAI) dans le cadre d'exercices et d'opérations réelles servent systématiquement à améliorer la prévention, la préparation et la réaction aux opérations et événements futurs. Ces six derniers mois, le Centre des sciences pour la sécurité de Recherche et développement pour la défense Canada (CSS RDDC) a fourni des conseils techniques et assuré un soutien analytique au Secrétariat de l'ACIFI à l'appui de l'élaboration d'un concept des opérations (ConOps). Plus précisément, RDDC a aidé à gérer deux ateliers du GT sur l'ACIFI, effectué une analyse environnementale, établi une taxonomie et fourni des conseils sur une méthode fondée sur l'évaluation du risque pour classer les recommandations par ordre de priorité, les sélectionner et y donner suite. L'équipe du projet a également examiné les modèles normalisés pour la présentation des recommandations, le suivi et les mécanismes de communication pour le Comité des directeurs généraux sur les interventions en cas d'incident. Le présent rapport scientifique (SR) a pour but de définir les avis, l'orientation et le soutien à l'analyse décisionnelle que RDDC CSS a fourni à la sécurité publique, ce qui est surtout destiné à faciliter l'élaboration du programme Concept d'opération.

Importance pour la défense et la sécurité

Sécurité publique Canada (SP) a été créé en 2003 pour assurer la coordination entre tous les ministères et organismes fédéraux responsables de la sécurité nationale et de la protection des Canadiens. SP coopère aussi avec les autres ordres de gouvernement, les premiers intervenants, les groupes communautaires, le secteur privé et d'autres pays dans le cadre d'initiatives de sécurité et de sûreté comme la sécurité nationale, les stratégies frontalières, la lutte contre le crime et la gestion des urgences. SP veille à ce qu'on adopte une approche coordonnée et intégrée dans la gestion des urgences, l'application de la loi, les services correctionnels, la prévention du crime et la sécurité frontalière. Le but du programme d'ACIFI est d'exploiter la force collective de la communauté fédérale d'intervention pour favoriser l'amélioration continue et s'assurer que les leçons retenues et les pratiques exemplaires sont utilisées de façon systématique et efficace afin d'améliorer les futures opérations. Le programme a une incidence directe et sans équivoque sur la qualité et la coordination des services de sécurité et de protection offerts aux Canadiens.

Table of Contents

List of Figures

List of Tables

This page intentionally left blank.

1 Introduction

1.1 Project Overview

The Continuous Improvement of Federal Event Response Working Group (CIFER WG) was established under the authority of the Directors General Event Response Committee (DG ERC),[1] within the governance system of the Federal Emergency Response Plan (FERP).[2] In accordance with the DG ERC-approved July 2015 Terms of Reference (see Annex A), a CIFER program was conceived to "harness the collective strength of the federal response community to drive continuous improvement and ensure that lessons learned and best practices are used to systematically and effectively improve future operations."[3] Specifically, CIFER was designed to address the following identified gaps:

- The lack of a systematic process for regularly sharing event response best practices or lessons learned within the federal family;
- The lack of a systematic process in place across the federal response community to validate or prioritize recommendations from after-action reports, nor is there one venue or committee that tracks such improvement measures and provides accountability for their completion; and
- The lack of a centralized location or repository where event response best practices and lessons learned can be aggregated, accessed and studied. Without this repository, there is no effective trend analysis to help guide future planning and event response.[4]

Public Safety (PS) Canada's Government Operations Centre (GOC) led the CIFER project, with oversight by a permanent working group of key stakeholders comprised of representatives from across the federal community. While the PS GOC led the CIFER project, the CIFER program is a federal community led Working Group. The CIFER WG reports to DG ERC who provides leadership and oversight. The CIFER WG was co-chaired by PS and another DG ERC member department (initially Transport Canada). This program has been developed as part of mandated legislative authorities, responsibilities and accountabilities under the *Emergency Management Act* (2007).

1.2 Project Background

In the spring of 2015, Defence Research and Development Canada's Centre for Security Science (DRDC CSS) was requested by PS to provide "best practice" advice and analytical support to the GOC and the CIFER WG to ensure that a systematic approach to lessons learned/after action reviews (AARs) was taken by the federal community to improve prevention, preparedness, and response to future operations or events. The DRDC CSS project team's role was to provide

[1] CIFER Proposed Program Plan – Document PS-SP-#1210313-v13, 15 May 2015. Note, DG ERC is a committee of Directors General (DGs), who manage operational response efforts and who direct, support and improve response planning and coordination for events affecting the national interest.
[2] Canada, *Federal Emergency Response Plan January 2011* (Ottawa: Public Safety Canada, 2011). Accessed March 2016 at: http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-rspns-pln/index-eng.aspx.
[3] CIFER Proposed Program Plan, p. 3.
[4] Ibid., p. 4.

academic and scientific rigor to the nascent CIFER program. At the time, it was anticipated that the results of this effort would provide a solid foundation for developing a program Concept of Operations (ConOps), with the overall aim of ensuring that PS and the CIFER Secretariat developed an effective, robust and defensible program that would subsequently be approved for implementation by DG ERC.

1.3 Aim

The aim of this scientific report (SR) is to describe the advice, guidance and decision analytic support that DRDC CSS provided to PS, which is primarily meant to better support the development of the program ConOps. This report summarizes DRDC CSS efforts to glean information on "best practices" related to lessons learned programs, including the methodology for selecting recommendations, a standardized template for the submission of recommendations, potential risk assessment methodologies that can be employed for prioritization of CIFER-managed recommendations, and tools and techniques for tracking recommendations and ensuring their implementation. Finally, this project will assist the development of the CIFER ConOps as well as inform partner / WG lesson learned implementation strategies. This report is being written from a lessons learned perspective to document and describe CSS involvement in the CIFER program, with a view to identifying and recommending areas for improvement.

1.4 Project Stakeholders

Several key departments provided initial support to the CIFER WG along with DRDC CSS. The CIFER WG was comprised of federal departments with mandates related to response under the Federal Emergency Management Plan and associated Emergency Support Functions (ESF), including:[5]

a. Transport Canada (TC);

b. Canada Border Services Agency (CBSA);

c. Natural Resources Canada (NRCan);

d. Public Health Agency of Canada (PHAC);

e. Department of Foreign Affairs, Trade and Development (DFATD);

f. Agriculture Canada (Ag-Can);

g. The Canadian Food Inspection Agency (CFIA);

h. Environment Canada (EC);

i. The Canadian Armed Forces / Department of National Defence (CAF/DND);

[5] See Annex A of the FERP, http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-rspns-pln/index-eng.aspx#a20 .

j. The Royal Canadian Mounted Police (RCMP);

k. Department of Fisheries and Oceans (DFO); and

l. Health Canada (HC), and others as applicable.

As a WG accountable to DG ERC, the goal of the CIFER WG was to collect and analyze recommendations or improvement actions from AARs/AIRs which implicate or affect multiple federal organizations, emphasizing issues that fall along the 'seams of government'. Organizations could also choose to submit recommendations from internal AARs/AIRs if the findings are deemed to be beneficial to the wider federal community. Recommendations could then be extracted from AARs/AIRs and submitted to the CIFER process using a standardized template to capture specific information to assist the WG with validation, risk assessment, and prioritization.

1.5 Project Breadth

DRDC CSS supported the CIFER Secretariat and WG in the development, conduct and analysis of two CIFER WG workshops, conducted a literature review / environmental scan of lessons learned "best practices," developed a taxonomy and provided advice and guidance on a risk-informed methodology for prioritizing, selecting and following through on recommendations submitted to the CIFER WG. The project team also examined standardized templates for the submission of recommendations, tracking and reporting mechanisms for DG ERC, and provided a suggested template for the development of a CIFER ConOps. Over the course of this seven month project, the project team—consisting of DRDC CSS staff and contract personnel—also participated in meetings, brainstorming sessions and workshops with DRDC CSS stakeholders, engaged key stakeholders from other federal government departments (OGDs) and gathered and analyzed survey data, information and artifacts from the CIFER WG. An overview of the project timeline and milestones is shown in Figure 1 below:

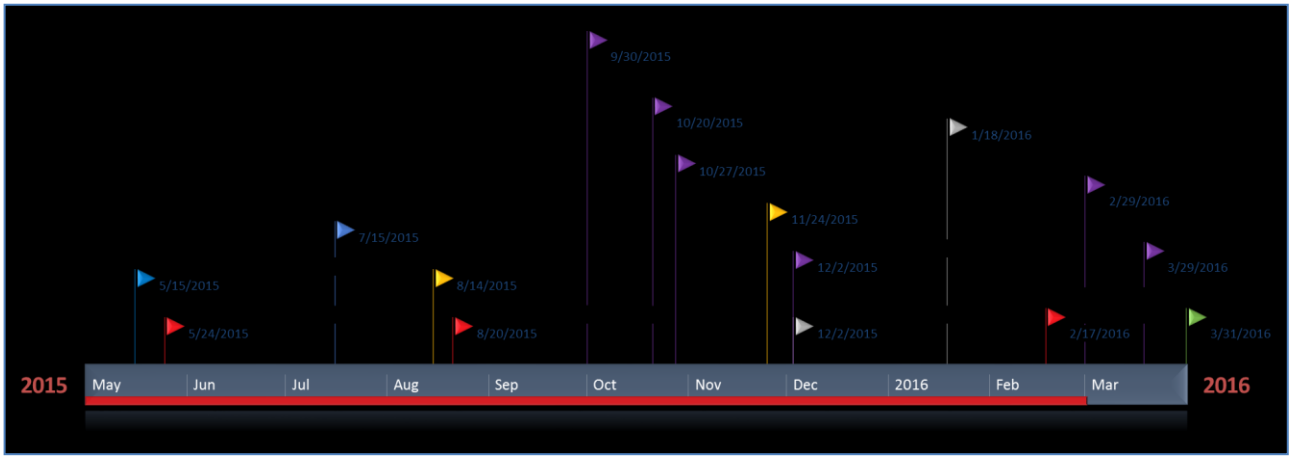

Figure 1: *CIFER Project Timeline and Milestones.*

1.6 Project Assumptions and Risks

Each federal institution has its own continuous improvement and "best practice" objectives, with each exposed to its own unique set of lessons learned, and each having its own information, process and resources. In the CIFER context, a shared process was pursued in order to leverage the collective expertise of individual departments, share resources and knowledge, and generate a consensus view of priorities for assessing recommendations that will be a start point for creating action plans. Given this shared view of lessons learned and accompanying process for assessing best practices, it was assumed that departments would be in a better position to further address and implement lessons learned that fall within their mandate, through the implementation of the CIFER program.

It was noted in the project charter that a major incident/event which occurred during project implementation would have a significant impact on the project in terms of the ability of the project team to provide relevant, useful results and recommendations and capture input/feedback in a timely manner. Given that PS and project participants were involved in other organizational activities in addition to CIFER, there was a risk that an external event would make it difficult to obtain access to project participants whose input and involvement were necessary in order to ensure the success of the CIFER program. Risk mitigation efforts included ongoing discussion and dialogue with PS on the scope of the CIFER program and WG consultation, engagement and liaison efforts, as well a shifting project deliverables to allow for flexibility in the project schedule.

While the project was somewhat truncated due the GOC's re-prioritization of efforts to support to Syrian Refugee Operations, DRDC CSS support to the project yielded positive results, in that the project team provided informative solutions and recommendations to support evidence-based decision making. Notwithstanding the external challenge posed by Operation Syrian response, the project team still delivered results and evidence sufficient to support the CIFER program ConOps. Furthermore, the DRDC CSS project team provided a back-brief on project status and methodology to DG ERC in March 2016, and it was noted that the DRDC CSS project involvement in the CIFER WG and ConOps development was wrapping up at the end of March.

2 Governance

2.1 Government of Canada Authorities and Responsibilities for Emergency Management

The *Emergency Management Act* (2007) establishes clear roles and responsibilities for all ministers in the areas of prevention/mitigation, preparedness, response and recovery. The Act stipulates that ministers are responsible for identifying risks that are within or related to their area of responsibility and to prepare emergency management plans to respond to those risks. It identifies the Minister of Public Safety as being responsible for "exercising leadership relating to emergency management in Canada by coordinating, among government institutions and in cooperation with the provinces and other entities, emergency management."[6]

The development of a lessons learned framework and methodology, led by PS in close partnership with other government departments in the CIFER WG, will enable federal institutions to perform lessons learned tracking, monitoring and analysis more consistently. CIFER will formalize a structure for combining departmental lessons learned to create a whole-of-government process to support emergency management planning in federal institutions. This process will provide an enhanced planning baseline for departments and central agencies to support current and emerging decisions in areas where greater cross-government coordination is required. Most notably, this initiative will result in the establishment of a federal CIFER WG, and will provide the means for sharing lessons learned information.

Among the challenges facing the federal response community is the need for awareness regarding Ministerial authorities and responsibilities for conducting lessons learned. The federal responsibility, including PS's role, goes far beyond conducing AARs and lessons learned, including the role of the GOC. To better illustrate the need and requirement for a comprehensive federal lessons learned program, it is important to reference which legislative responsibilities provide direction and guidance for the CIFER program. In the *Emergency Management Act* (2007), the Minister's responsibilities (among others) under Section 3 include:

a. Establishing policies, programs and other measures respecting the preparation, maintenance, testing and implementation by a government institution of emergency management plans;

b. Providing advice to government institutions respecting the preparation, maintenance, testing and implementation of emergency management plans; and

c. Analyzing and evaluating emergency management plans prepared by government institutions.[7]

[6] See Emergency Management Act, S.C. 2007, c. 15.Accessed August 2016 at: http://laws-lois.justice.gc.ca/eng/acts/E-4.56/.
[7] Ibid.

2.2 Ministerial Responsibilities for Emergency Management

A strong case for a comprehensive whole-of-government lessons capability can be made in reference to other Ministerial responsibilities, with reference to the following Ministerial responsibilities as well:

a. Establishing policies and programs respecting emergency management;

b. Conducting exercises and providing education and training related to emergency management;

c. Promoting a common approach to emergency management, including the adoption of standards and best practices; and

d. Conducting research related to emergency management.

In addition, in the EMA, each Minister has the responsibility to:

a. Prepare emergency management plans in respect of those risks;

b. Maintain, test and implement those plans; and

c. Conduct exercises and training in relation to those plans.

Attributing the requirement for the CIFER program may seem like a pedantic exercise. However, the distinctions are important in terms of framing the requirement. Leading up to DRDC CSS's involvement in the project, the policy and legislative rationale for CIFER had largely been attributed to the PS's departmental and mandate-specific responsibilities; the integration with other Ministerial authorities and responsibilities across government was implicit. Regardless, the conceptual foundation for a comprehensive lessons learned program and capability extends beyond a single department's mandate and Minister's responsibilities.

2.3 Federal Emergency Management Policy

The *Federal Policy on Emergency Management* articulates the need to incorporate continuous improvement, lessons learned and best practices for each of the four pillars of emergency management.[8] Other federal policy documents with relevance to the CIFER such as *An Emergency Management Framework for Canada, Second Edition* outline a number of principles that guide the design, implementation and ongoing improvement of policies, programs, procedures, guidelines and activities of emergency management systems in Canada; the ninth deals with continuous improvement:

[8] The Federal Policy on Emergency Management outlines specific continuous improvement/lessons learned activities for each of the four pillars of emergency management. See *Federal Policy for Emergency Management: Building a Safe and Resilient Canada* (Ottawa: Public Safety Canada, 2012. Accessed July 2016 at: https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/plc-mrgnc-mngmnt/plc-mrgnc-mngmnt-eng.pdf.

> Lessons learned and knowledge generated from quantitative and qualitative information should be used to develop "improved practices", which are then shared widely. After emergencies or disasters occur, a systematic approach is used to learn lessons from the experience, increase effectiveness and improve emergency management practices and processes. Recovery from a disaster may be completed by documenting and internalizing lessons learned. Continuous improvement, including incremental and transformational change, is undertaken systemically as an integral part of emergency management measures and practices at all levels, as appropriate, to minimize the recurrence of problems.[9]

Therefore, to frame the requirement for CIFER, a dedicated effort needs to be undertaken to attribute CIFER to both PS Ministerial responsibilities *and* the emergency management responsibilities of each Minister accountable to Parliament. This effort entails developing a set of common guidelines by which federal emergency management institutions develop joint, national and horizontal programs and policies, including specific direction and guidance to staff from each organization. Such an approach is required to ensure there is common agreement across government as to the program's aims and scope, due to the structure of the Financial Administration Act (FAA), as well identify a pool of human and financial resources in order to address cross-cutting issues of national significance that the potential to affect multiple institutions. This includes capturing, tracking and prioritizing AARs or After Incident Reviews (AIR) across the emergency management spectrum, from prevention, preparedness, and recovery operations. Attributing CIFER to the EMA in general and PS Ministerial responsibilities in particular is a start point. DRDC CSS recommends that a thorough attribution exercise be undertaken, specifically to link the CIFER program to the broadest possible set of Ministerial responsibilities in the EMA. This attribution exercise, when fully explained, will anchor the initial foundation of CIFER as a viable program and ensure necessary "buy-in" required for successful implementation.

2.4 CIFER Program Objectives

Lessons learned processes can be long, strenuous and challenging processes. Due to many pressures, including political, governments typically want fast solutions to issues and incidents, often before a full analysis is completed. Obstacles that prevent the learning of lessons include organizational / cultural barriers, resource limitations, lack of appropriate governance and insufficient analysis for credible results.[10] To address these barriers, the CIFER program was designed to achieve the following objectives:[11]

---

[9] See: Canada, *An Emergency Management Framework for Canada, Second Edition* (Ottawa: Public Safety Canada, 2011), p. 9. Accessed July 2016 at: https://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-mngmnt-frmwrk/mrgnc-mngmnt-frmwrk-eng.pdf.

[10] See S. McIntyre, K. Dalkir, P. Paul, and I. Kitimbo, *Utilizing Evidence-Based Lessons Learned for Enhanced Organization Innovation and Chang* (Hersey PA: IGI Global, 2015); and S. McIntyre and K. Kaminska, *Capturing Lessons That Should be Learned: An After Event Review for Whole-of-Government Security Planning and Operations*, Defence R&D Canada – Centre for Security Science, Ottawa, DRDC-CSS-SL-2011-11.

[11] As briefed by the CIFER Secretariat to DG ERC in May 2015. PS-SP-#1338885-2-Presentation to DG ERC May 2015 refers.

- Create a process to gather, analyze, prioritize, track, share, and report on high-level recommendations relevant to the federal response community;
- Establish DG ERC as the single venue to coordinate and provide accountability for recommendations within the federal response community;
- Establish and operate a permanent Working Group under DG ERC, with the secretariat function residing at the GOC; and
- Establish a repository that would provide the means to track the implementation of recommendations, a database to enable long term trend analysis, and a resource to inform future event response planning.

The CIFER program was designed to replace and improve upon the Capability Improvement Process (CAIP), a prior PS-led collaborative effort and whole-of-government approach to the collection and analysis of government response activities for both exercises and incidents. As noted in a recent (2014) audit of emergency management planning, leadership and oversight:

> Through Public Safety's Capability Improvement Process (CAIP), exercise-specific corrective actions committed to by lead institutions are documented by Public Safety Canada and are shared with Interdepartmental Exercise Coordination Committee. However, as with the after-action reports, no trend analysis is conducted. As well, no consolidated list of outstanding corrective actions is produced by the Department for institutional action, monitoring or for EMC oversight. It is important to note that Public Safety Canada has no authority to ensure institutional recommendations are implemented as intended.[12]

It was PS's intent that the CIFER program redress the shortfalls noted above.

2.5 Accountability Framework

The CIFER program's three key functions were to:

- Provide leadership in the creation of a community-based approach to continuous improvement for federal event response;
- Work collaboratively to build and maintain the tools and methodology to effectively track, prioritize, share, and report on lessons learned and best practices; and
- Support the FERP governance structure, and related communities, in their efforts address lessons learned.

CIFER is one of five working groups that were accountable to the ADM EMC through the DG ERC (See Figure 2 below). Interoperability, collaboration and cooperation sister committees should be a key objective of the CIFER program, as their work will also inform the continuous improvement and lessons learned program.

[12] Public Safety Canada, Internal Audit of Emergency Management Planning: Leadership and Oversight. January 2014. Accessed March 2016 at: http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ntrnldt-mrgncy-mngmnt-plnnng/index-en.aspx.

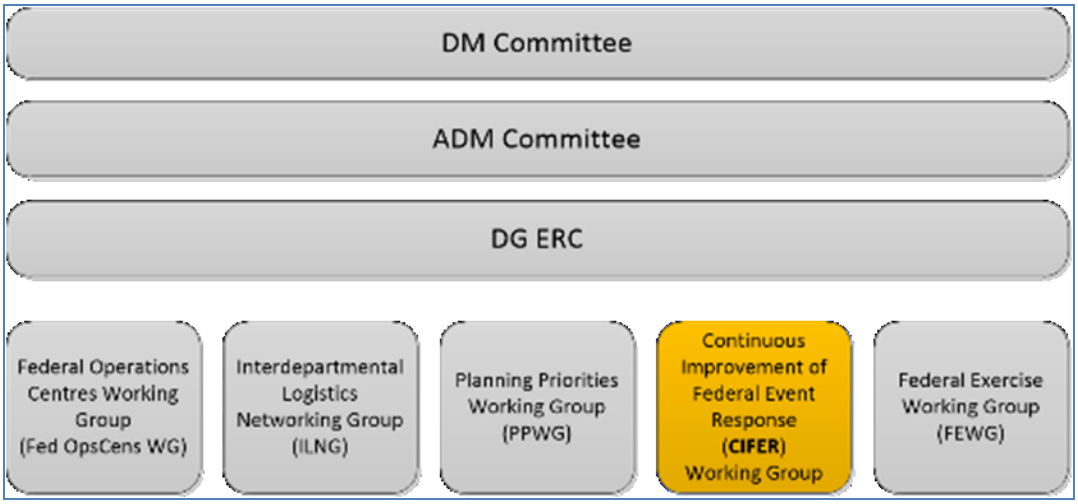

Figure 2: *The CIFER WG was one of five (5) WGs accountable to the DG ERC under the Federal Emergency Response Plan (FERP) Governance Structure.*

2.6 Shared Responsibility

PS Canada's GOC led the CIFER project, with oversight by a permanent working group of key stakeholders comprised of representatives from across the federal community. The CIFER program mandate to "harness the collective strength of the federal response community to drive continuous improvement and ensure that lessons learned and best practices are used to systematically and effectively improve future operations"[13] requires the commitment and support of contributing DG ERC member departments. CIFER was envisioned to provide the framework, process, and governance system to support and drive improvement within individual departments and, more broadly, within the federal response community. Through this framework, the program has the potential to provide the accountability and coordination necessary to ensure efficient implementation of changes and the sharing of lessons among partners. As such, the success of the CIFER program as it is currently envisioned is predicated upon the willing participation of all contributing federal departments, as depicted in Figure 3 below.

[13] CIFER WG Terms of Reference, dated July 2015.

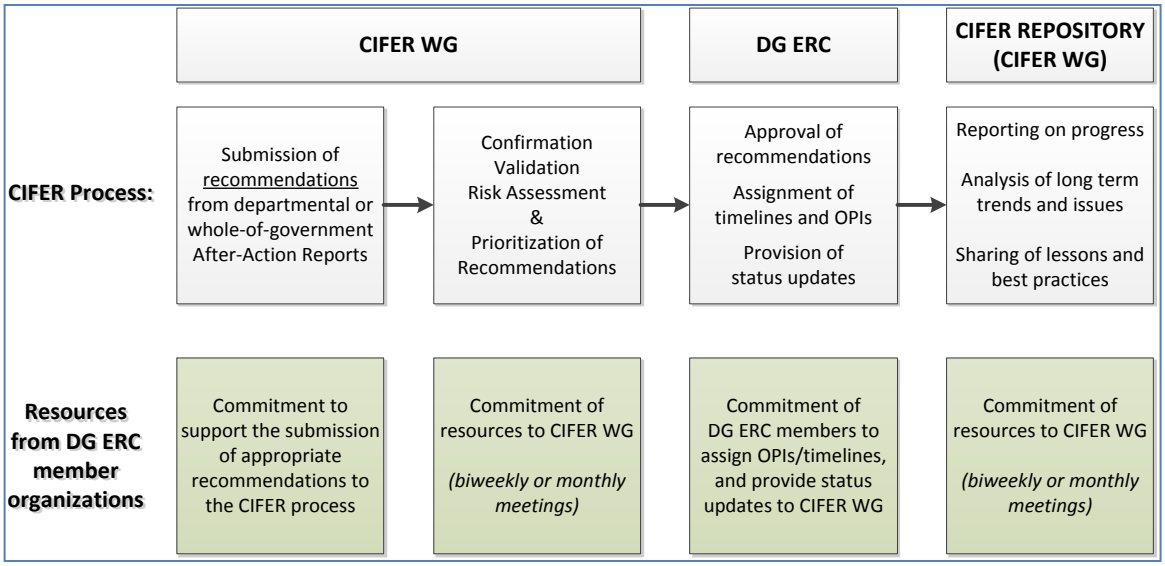

Figure 3: *CIFER relies on resource commitments and "Crowd Sourcing[14]" from DG ERC member organizations.*

2.7 Creating a Shared Accountability Model

Given the breadth and scope of the emergency management portfolio across Canada, with federal, provincial and territorial agencies each managing diffuse and separate mandates across multiple jurisdictions, the only realistic approach to further developing the CIFER program is a collaborative, shared accountability model. While this requires considerably more effort in terms of consensus-building and engagement initially and up front, it provides a unique opportunity to serve the larger national emergency management community and, by incentivizing the submission and sponsorship of recommendations, either through positive reinforcement like recognition or access to additional (pooled) resources, or through other means of persuasion such as tying CIFER participation to the Management Accountability Framework or re-allocating budget resources to departments willing to submit and sponsor recommendations. Similarly, the way in which recommendations are addressed would also be a shared responsibility with shared resources. This puts the emphasis on a shared accountability model and governance framework that wholly leverages community support.

The CIFER program should set the standard for interagency collaboration. CIFER's mantra should be that this program will "improve the safety and security of Canadians" and should eventually include provincial and territorial emergency management organizations. In order to implement this shared accountability and governance framework, there should also be a shared pool of resources. In fact, consideration might be given to creating a permanent Secretariat, residing in PS Canada (possibly even outside of the GOC) but staffed with personnel seconded from other departments and agencies. The reason this secretariat might reside outside of the GOC is that it would be able to address the full spectrum of public safety and security challenges,

[14] This term was used tongue-in-cheek in a plea by DG Government Operations Centre to DG ERC member organizations to provide personnel support to the CIFER program during the 17 February DG ERC meeting.

emerging trends or historical case studies, and would not simply be focused solely on events and exercises. The GOC is tied primarily to short-term events—this would allow for a more fulsome, broader and strategic approach to lessons learned within Canada's emergency management community.

2.8 Summary

Not unlike its predecessor, the CAIP, the CIFER program still does confer upon PS any additional authority to ensure institutional recommendations are implemented. Rather, the CIFER program relies upon "volunteerism," the commitment of its membership and a willingness to collaborate and cooperate in the institutionalization of recommendations (observations and insights) into lessons learned, thereby ensuring continuous improvement. The pooling of resources (both personnel and financial) with a PS Canada-hosted CIFER Secretariat (preferably outside of the GOC) and the creation of a shared accountability model would help leverage broader federal event response community support. In fact, CIFER has the potential to change the emergency management landscape within Canada. As the program evolves, it can provide a means to share information, lessons and best practices among all federal, territorial and provincial partners, fostering mutual support, collaboration and cooperation within Canada's emergency management community.

3 Literature Review / Environmental Scan

In support of inter-agency deliberations to develop a continuous improvement process for lessons learned, the project team examined the role that lessons learned plays in supporting external organizations. The purpose of the environmental scan / literature review was to gather information on lessons learned programs, highlight some "best practices" within the larger lessons learned community and inform the efforts of the CIFER Secretariat and WG as they establish their nascent program and develop their ConOps.

The environmental scan and literature review included CIFER program authoritative and foundational documents (see Annex B – Artifacts), as well as numerous manuals, key reports, articles and web sites regarding leading military and emergency management organizations with well-established lessons learned programs,[15] including the following:

- US Center for Army Lessons Learned;
- American, British, Canadian, Australian Armies' Program (ABCA);
- NATO Joint Analysis and Lessons Learned Centre (JALLC);
- Defence Research and Development Canada (DRDC);
- US Emergency Management:
  - Federal Emergency Management Agency (FEMA);
  - Centers for Disease Control and Prevention (CDC);
  - Department of Energy (DOE).
- UK Emergency Management; and
- Australian Emergency Management.

The environmental scan / literature review also examined the growing interest in emergent and dynamic learning within crisis management, whereby first responders and emergency management leaders are expected to learn both during and after the event, and organizations are encouraged to embrace emergency learning as a capability. These concepts were illustrated in the "Intra Action Report" used to track both positive and negative observations, insights, experiences and lesson during the 2014–15 Ebola Crisis. The paper concludes that emergent learning is a rapidly evolving area of study and that a balanced approach; that is, both the more conventional formal lessons learned process (like AARs) and dynamic learning is likely the best approach for the CIFER program.

The environmental scan / literature review was also intended to assist the project team in building an effective taxonomy, developing the conceptual approach for the reporting dashboard, and informing the development a risk-based approach to categorizing and prioritizing observations captured by the CIFER WG.

[15] For additional details, consult: Jim Legere, *CIFER Environmental Scan/Literature Review*, DRDC-RDDC Contract Report DRDC-RDDC-2015-C244, October 2015.

The review included the examination and analysis of CIFER keystone/conceptual documents, a number of publications, articles, guidance documents and miscellaneous literature on continuous improvement, and the military and emergency management organizations considered leaders in the lessons learned and continuous improvement arena. The literature review / environmental scan uncovered several common, recurring themes and key takeaways that will inform the development of the CIFER methodology to intake, manage, monitor, report on and analyze observations and lessons learned.

Specifically, eight broad themes were identified as potential areas of interest or key takeaways to inform the development of the CIFER Program and its intake, management, reporting on and analysis of observations, insights and lessons:

- **Methodology**—a review of commonalities and "best practices" in continuous improvement lessons learned programs;
- **Resourcing**—appropriate funding and staffing, and the support of organizational leadership;
- **Authorities**—the development of a clear "accountability framework" and the authority to ensure institutional recommendations are implemented as intended;
- **Routine Training and Exercises**—programmatic training at the tactical, operational and strategic levels to test procedures, capabilities and readiness levels;
- **Orientation and Sustainment Training for CIFER WG members**—introductory and refresher training for CIFER WG members, especially with respect to analysis of recommendations and organizational learning;
- **Use of Technology/Automated Tools**—databases, web-based applications and extensive interconnectivity/networking are key enabler along with the digitization of plans, learning resources and policies;
- **Scientific Rigor**—continued engagement and partnership with the scientific and academic community to help resolve "wicked problems" found in today's complex public safety environment; and
- **Balancing Formal Lessons Learned Approach with Emergent/Dynamic Learning**—striking a balance between the formalities of the conventional lessons learned approach with the evolving field of emergent/dynamic learning.

The literature review also included, as appendices, two questionnaires designed to assist the development and improvement of the CIFER project. Some of the questions contained therein were employed later on in the project, as detailed in Section 5.

4 Project Workshops

There were two CIFER workshops held during this project, and the DRDC CSS project team figured prominently in both of them. The first workshop brought together CIFER WG representatives from ten federal departments, introducing them to the CIFER program and conducting brainstorming and plenary sessions. The second workshop provided the CIFER WG members with information gleaned from the literature review / environmental scan, survey results and a facilitated brainstorming session to refine the CIFER methodology and to begin development of a taxonomy. These workshops provided the opportunity for the project team to engage and consult face-to-face with CIFER end-users and proved very valuable in garnering unvarnished feedback on the CIFER process.

4.1 Workshop #1 – 14 August 2015

CIFER Workshop #1 was held on Friday, 14 August 2015, at the RCAF Officers' Mess, Ottawa, ON. A detailed agenda from this focus group can be found at Figure 4 below. There were representatives from ten federal departments, along with the core CIFER Secretariat members and presenters from DRDC. Departments represented were as follows:

- Canadian Food Inspection Agency;
- Communications Security Establishment;
- Department of Foreign Affairs, Trade and Development;
- Defence Research and Development Canada;
- Public Safety – Government Operations Centre;
- Health Canada;
- Industry Canada;
- Public Health Agency of Canada;
- Shared Services Canada; and
- Transport Canada.

The co-chair of the CIFER WG welcomed all the participants and turned the floor over to the facilitators, comprising the core CIFER Secretariat members from the PS GOC. The facilitators provided an overview of CIFER program, explaining that the goal of the program was to provide accountability for continuous improvement through a community-driven, permanent WG, and to provide a bridge between AAR and implementation and validation of recommendations for improvement.

Workshop participants were then provided an informative presentation entitled "Critical Success Factors for Effective Lessons Learned." Much of the presentation was based upon a book on lessons learned and organizational learning that the presenter had recently co-authored.[16] Of

[16] S. McIntyre, et al.

particular interest to the audience (and the CIFER project team) were the presenter's insights on critical success factors such as an organization culture that is conducive to learning, effective leadership, robust lessons learned cycle, and realistic action plans. The presenter also observed on obstacles to organizational learning such a cultural barriers, resource limitations, lack of appropriate governance and insufficient analysis, offering these as a cautionary tale for the CIFER program.

Table 1: *Workshop #1 Agenda.*

Time	Description	Outcome
0900-0905	Welcome and Introductions	N/A
0905-0915	CIFER Program Overview/Update	A brief review of program status to date.
0915-0945	Critical Success Factors for Effective Lessons Learned	Susan McIntyre, DRDC
0945-1030	Risk Assessment Overview	Shaye Friesen, DRDC CSS
1030-1045	**Break**	
1045 - 1200	Group Activity: Development of indicators for CIFER program inclusion	Groups of 2-3 people will be given approximately 15 minutes at each station (flipchart) to brainstorm ideas. Groups will brainstorm thematic areas for CIFER
1200-1300	**Lunch**	
1300 – 1400	Group Activity …continued	
1400 – 1430	Plenary. Review results of the flip-chart groups. 5 Min each	A general understanding of the results from the flip-chart session.
1430-1445	Closing and Next Steps	Review next steps
1445-1500	Post meeting with CDT members only	Confirmation of next steps for the CDT

The participants were then provided an informative briefing on risk assessment, looking at analytical 'best practices' in the public safety and security domains. Risk was defined as a function of probability and consequences and the distinct difference between risk-based and risk-informed decision support was enunciated, underscoring the importance of properly structuring the problem using taxonomies to ensure clear terms and definitions. The All-Hazards Risk Assessment (AHRA) taxonomy was used to frame some risk assessment schemes and principles. Some of the challenges with risk assessments were reviewed and general steps for their conduct were outlined. Feedback for both of these DRDC-sponsored presentations was very positive and generated considerable discussion. There were some concerns as to whether a pure risk assessment is applicable to the CIFER process. It was explained that the most important thing is to take a systematic approach to prioritizing recommendations—one that is defensible and evidence-based.

Part 2 of the Workshop focused on group work and brainstorming ideas to develop a risk assessment methodology and process used to prioritize recommendations. Participants were divided into groups of two to four persons and tasked with brainstorming as to what criteria would be used to triage recommendations upon their submission to the CIFER process. The groups were all asked to record criteria for recommendations to be included in the CIFER process, and characteristics of recommendations that result in their exclusion from the CIFER process. At the end of the Workshop, the groups were brought together in plenary to summarize and discuss the brainstorming results, provided in Table 2 below.

Table 2: *"Triaging" CIFER Recommendations: Workshop #1 Brainstorming Results.*

To be INCLUDED in CIFER, AARs / recommendations must have the following characteristics:	**Items that should be EXCLUDED from the CIFER process:**

• Multi departmental/multijurisdictional area of concerns
• Affect national/international confidence in the government
• Affects the effective functioning of government:
  ◆ Has a high impact on the government
  ◆ Affects the business continuity of core departments
• Affects the health/safety/security/economic well-being of Canadians:
  ◆ Significant public safety concerns
  ◆ Serious injury to Canadians/government
• Affects legislative requirements:
  ◆ Implicates the whole-of-government EM framework
  ◆ Falls within the mandate/authority of the FERP governance
  ◆ Affects Emergency Support Functions
  ◆ Falls under one of the four pillars of EM
• Requires senior management direction/attention/authority:
  ◆ Resource allocations, recurrent unresolved issues, emerging threats
	• Recommendations that can be accomplished under the specific departments' current:
	  ◆ Mandate
	  ◆ Authority
	  ◆ Capacity
	  ◆ Funding
	• Recommendations that have legal, diplomatic and/or stakeholder restrictions
	• Recommendations that can/have been addressed through other government channels
	• Recommendations that are simply too small and/or unrealistic

The results of Table 2, with 10 departments present, were reviewed during the workshop, where participants were offered an opportunity to provide additional comment comments and vetting. The results of the workshop led to CIFER Secretariat's development of a three-part process model, as depicted in Figure 4 below. Scope refers to what recommendations (derived from events or exercise AARs) will be submitted to the CIFER program and how they will be triaged. Prioritization refers to how those recommendations are analyzed and ordered by importance. Accountability refers to how the recommendations will be tracked and implemented.

Figure 4: *CIFER Process as conceived by the CIFER Secretariat following Workshop #1.*

Other issues, suggestions and considerations that were discussed in plenary, but considered outside of the scope of the workshop, included:

- The contention that the CIFER program should include strengths and some sort of opportunity analysis;
- Information management/information technology (IM/IT) support for managing recommendations (i.e., secure vs. unsecure means);

- Aligning CIFER with the current business planning process to leverage budgets, policy, plans, government priorities;
- Ensuring that there is an audit trail for rejection or acceptance of recommendations by the CIFER WG;
- The ability of the CIFER WG to maintain situational awareness of other governance structures and lessons learned processes; and
- The contention that the methodology employed needs to be consistent and/or complimentary to capability based planning.

The above-mentioned issues were captured in the CIFER Secretariat's Record of Outcomes[17] for Workshop #1.

4.1.1 Analysis

Workshop #1 afforded the opportunity to bring CIFER WG members together, to provide background information on the program, and to gain feedback and perspective on managing observations, insights and lessons from AARs compiled as a result of events or exercises. While it was a very fruitful endeavor, particularly as an inaugural workshop, there were some areas where improvements could be made in future similar endeavors. First, the level of participation (only 10 of 19 stakeholder federal departments were represented) was moderate, especially given the importance attached to this program in previous DG ERC meetings. This low attendance was likely due to the timing of the workshop on a Friday during peak summer vacation season. This situation was mitigated by the CIFER Secretariat distributing a Workshop Synopsis to all CIFER WG members and allowing feedback electronically, although it is uncertain as to whether such feedback was provided. Secondly, the importance of establishing a process and the emphasis on screening out recommendations brought to CIFER seemed to overshadow the arguably more important goal of defining the problem statements and conducting in depth, evidence-based analysis of AARs and insights gleaned from past events and exercises.

When establishing a lessons learned program, incentivizing recommendation submission would seem to be a more effective approach until such time as the program is well-established. Additional time could have been allocated for information gathering from various departments (i.e., spend more time on determining what some of the key issues/concerns of contributing departments might be before jumping directly into a recommendation triaging process). Emphasis on process and being seen to be achieving results were recurring themes throughout this project, although, in fairness to the CIFER Secretariat, they were/are under tremendous pressure from DG ERC and DG GOC to produce results in the wake of the October 2014 terrorist incidents in St-Jean and Ottawa.

Overall, this workshop certainly achieved success in increasing CIFER WG membership awareness of the value of lessons learned / continuous improvement programs to organizations, as well as the effectiveness of risk assessment as a methodology for prioritizing recommendations. Finally, it provided an excellent starting point for the development of the literature review / environmental scan that followed (see Section 4).

[17] Document PS-SP-#1602594-v1-CIFER_Methodology_Workshop_1_–_Summary_19_Aug refers.

4.2 Workshop #2 – 24 November 2015

Workshop #2 was held at the Public Safety offices on the 12th floor, 269 Laurier Avenue, Ottawa, ON from 0900–1200 hrs, 24 November 2015. A copy of the Workshop agenda is shown below at Table 3. The first part of this Workshop updated the CIFER WG members on the overall CIFER program, and provided attendees with an overview of the Literature Review / Environmental Scan and the CIFER WG / DG ERC survey results. The second part of the morning was dedicated to brainstorming and group discussion. Firstly, CIFER methodology options, in particular, the pros and cons of event-based analysis of AARs and recommendations versus thematic-based analysis of AARs and recommendations.

Table 3: *Workshop #2 Agenda.*

Time	Description	Outcome	Responsibility
0900–0905	Welcome and Introductions	N/A	Chad Scarborough / Sheila Gordon
0905–0915	CIFER Program Overview/Update	A brief review of program status to date	Chad Scarborough / Sheila Gordon
0915–0945	Overview of Environmental Scan	To highlight those specific areas to take note of	Jim Legere
0945–1000	Results from Questionnaires	High level analysis of the results from the questionnaires	Jim Legere
1000–1145	Methodology Options	An overview of the three methodology options	Shaye Friesen
1145–1200	Closing and Next Steps	Review next steps	Chad Scarborough / Sheila Gordon

The brainstorming / facilitated discussion portion of this workshop bore significant fruit for the CSS project team in that it provided the opportunity for engagement with CIFER WG members and informed the development of the taxonomy and refinement of the CIFER methodology. Table 5 below shows the risk-informed methodology and taxonomy frameworks gleaned from this session.

4.2.1 Event Based and Theme Based Models

In an effort to derive maximum value of useful information from the data collected by the CIFER WG, two preliminary conceptual models were constructed by DRDC CSS. These two models describe AAR/recommendations through slightly different lenses, and were presented to the CIFER WG by DRDC CSS during Workshop #2. At the time, there was an emerging consensus within the core membership of the CIFER WG that there was a need for a common understanding of different options for articulating the dynamic interaction of themes identified in the evolving

taxonomy. The conceptual models were derived from DRDC CSS's practical understanding and experience in designing risk-assessment frameworks and methodologies.

Additional considerations that guided the development of the two conceptual models included: the scope and definitions (i.e., need for a common agreement and definition what constitutes a "risk" to the CIFER program); the limited resources to action all recommendations, and corresponding need to utilize a risk-informed/security matrix evaluation; the requirement to substantiate rationale for CIFER decisions (i.e., adopt a traceable, defendable, program priorities); explicit linkage to other plans, programs or government initiatives; access to data/information, specific SMEs and evidence base; and the "end-state" using different visualization options for displaying results (e.g., a 4x4 risk matrix, or scatterplot diagram). Some general conclusions, observations and recommendations for the way ahead are provided in the following sections.

The current CIFER program model is AAR (i.e., event) based. In this model (see Figure 3), the CIFER WG analyzes recommendations and identifies potential rating factors that apply across, such as the following:

- Feasibility (greater than a minimum threshold value X);
- Impact (greater than a minimum threshold value X);
- Cost/Financial; and
- The number of departments/agencies.

The results of the event-based approach to prioritization would then be combined in a matrix, using a qualitative language ladder to evaluate the different recommendations. Recommendations from each report could have the same basic tenants, but be worded differently and each has a separate "Action Plan." This approach is still meaningful, but the overall context is lost in the Quarterly Report.

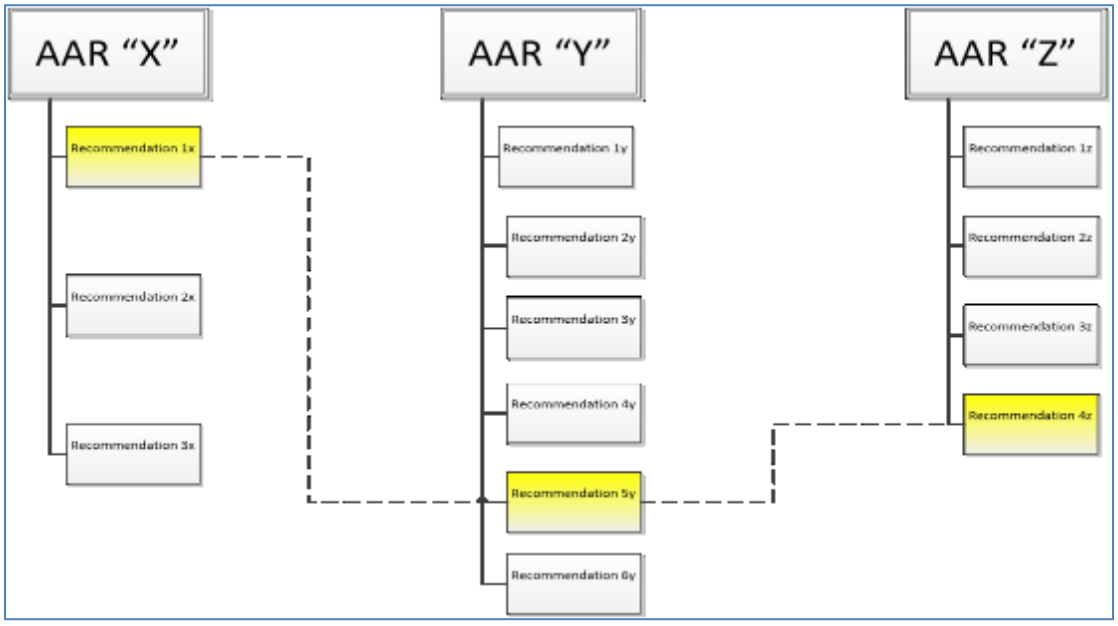

Figure 5: *Event-Based Approach to Recommendation Analysis and Prioritization.*

Central to the effectiveness of a thematic based approach for the CIFER program would be to "bin" or group recommendations under several common categories (e.g., Governance, Plans, Policy, Equipment and Training), and derive the maximum amount of information from the WG. This would be relied upon to perform an analysis and synthesis of information function, rather than seek quantify multiple recommendations raised through individual AAR reports/events. The nature of this approach is such that it provides a "body of knowledge" or evidence base for further substantiating why recommendations are being bundled together and put forward to DG ERC, which will permit a more informed discussion/confirmation/disconfirmation etc. of the context and recommendations drawn a series of events and exercises versus focusing on a single report.

At the time of Workshop #2, the project team assessed that recommendations from different AARs/exercises may have multiple similarities. In order to alleviate duplication or work and keep the Quarterly Report to a manageable size for senior management, a "thematic approach" was recommended for consideration by the CIFER WG. Under this construct (see Figure 6), incoming recommendations will be grouped into categories under similar themes. The CIFER WG would then be obliged to develop theme-based recommendations to address multiple instances of recurrence. The CIFER WG would then assume the role of an analytical body that provides recommendations to DG ERC, based upon the evidence incoming from departments. This approach:

- Provides an evidence-base for further substantiation if needed (audit trail);
- Creates a more informed discussion/confirmation/disconfirmation during DG ERC;
- Links CIFER to the strategic context, in that AAR/recommendations are drawn from a series of events rather than focusing on a single report; and
- Treats the "body of evidence", instead of the single instance of occurrence.

The thematic approach is, arguably, more resource intensive because CIFER SMEs would need to develop broad "problem statements" and rate or prioritize the AAR/recommendations accordingly (e.g., frequency of occurrence, impact). This could be particularly onerous, especially if members of the CIFER WG are not familiar with the evolving EM/safety and security environment that go beyond the mandate of individual departments. A thematic model would account for those recommendations that are similar from similar reports and provide evidence for tracking and audit purposes. CIFER WG would recast these similar recommendations into a single recommendation for DG ERC.

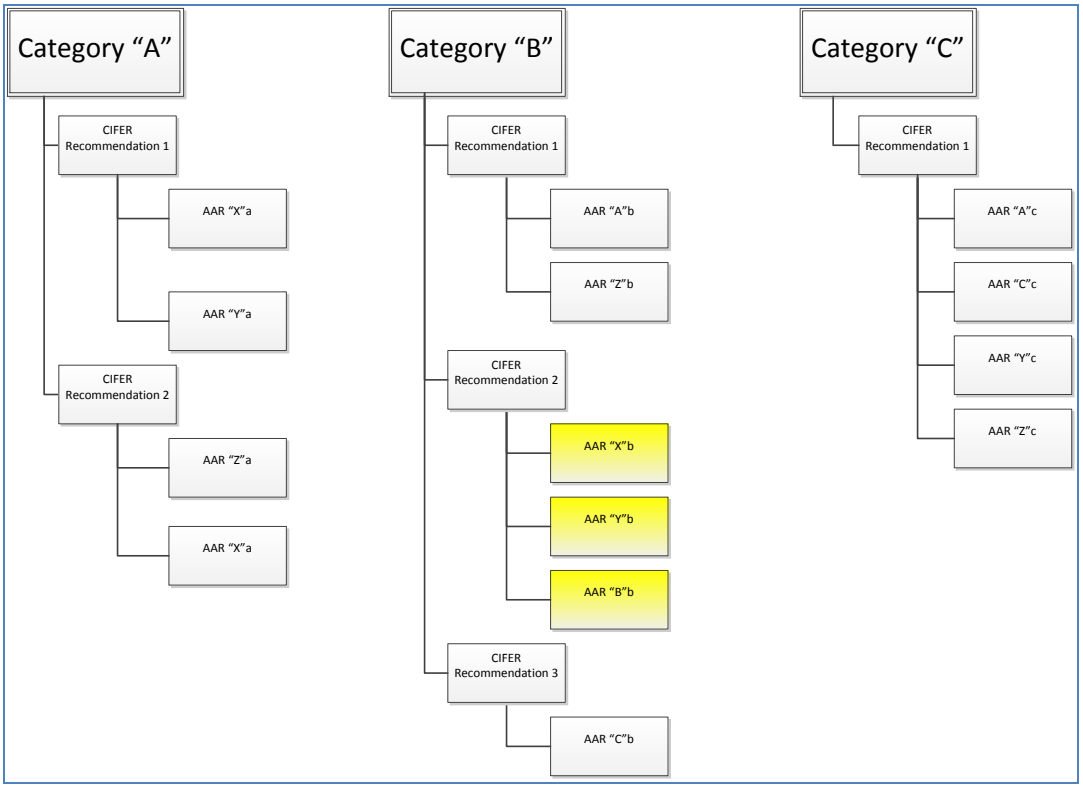

Figure 6: *Thematic Model for Recommendation Analysis and Prioritization*.

Participants were given the opportunity to review the models that were prepared by DRDC CSS during the Workshop #2. It was recognized by CIFER WG participants that both approaches (i.e., the thematic-based and event-based model) have the potential to provide decision makers with valuable information. The creation of these two models allowed the various AARs/recommendations and lessons emanating from event responses to be view from multiple perspectives, where the information requirements can be adjusted or tailored to decision requirements. While the thematic based model is effective at breaking down these issues into manageable pieces aligned with organizational functions, the event-based approach has the advantage of illustrating overall improvement and demonstrating progress (or lack thereof) towards implementation/follow-on action items over a period of time.

In the final analysis, it is recommended that the CIFER program CONOPS consider the development of a "hybrid solution," involving a mix of both approaches as an interim step towards the effective implementation of a comprehensive reporting dashboard for the CIFER program.

4.2.2 Analysis

The models presented in workshop # 2 faced several challenges. Participants reacted positively to the two models that characterized the CIFER program. However, the process used to gather feedback consisted of group brainstorming, which was followed by a discussion on topics related to the taxonomy. The models facilitated interactions with the CIFER WG, and require circulation to a wider range of stakeholders for comments, vetting and validation. Regardless, there was

value in presenting the models as a way to gain further insight into the challenge of whole-of-government lessons learned, if only to better characterize the problem, even if a final consensus by participants not obtained.

The rationale for advancing a thematic based approach for prioritizing lessons learned stemmed from the need to categorize recommendations by taking a macro-level, aggregate view of the data. Although the CIFER methodology was event based, and there was general agreement around a thematic approach, there is a need for greater interaction with key stakeholders to capture the essential activities that comprise the basis for subsequent modelling activities. The development of a conceptual model is designed to show the activities needed to carry out the process (i.e., it defines the "how"). The extent of the modeling efforts was limited, and determined by the evolving nature of CIFER program requirements. Initially, these two high-level, low resolution models were created by DRDC CSS within the context of CIFER as a means to stimulate, feed and structure debate. Future conceptual models need to be validated against the formal CIFER process and supporting information systems, comparing the preliminary concepts with real world situations, and then identifying opportunities for change and improvement.[18]

Although workshop #2 provided the CIFER project team a unique and interpersonal engagement opportunity with the CIFER WG members, it was initially scheduled for October; however, it was re-scheduled for 4 November and, finally occurred a few weeks later. There are a number of factors that contributed to this deferral, not the least of which was a change of government in October 2015 and the resultant upheaval within federal government departments and agencies. Moreover, in early November, when the new government announced its plan to re-settle 25,000 Syrian refugees in Canada by 1 January 2016, many of the GOC staff and core CIFER team were re-tasked to support the Syrian Refugee Operations—operations that quickly became the number one priority for the GOC. This not only slowed the progress of the CIFER project team throughout most of December, but it also seriously limited their access to key CIFER WG and DG ERC personnel who were similarly re-tasked and consumed with supporting current operations. The effect of current operations as an impediment was identified as a potential risk to the success of the CIFER project from the very beginning.[19] However, the CSS project team was able to continue their work and support the remaining two core CIFER Secretariat staff with development of the taxonomy and methodology, due in no small way to the feedback garnered during this workshop.

[18] The basis for this approach is described in: Peter Checkland, *Soft Systems Methodology in Action* (Chichester, England: John Wiley and Sons Ltd., 1999).

[19] CSSP Task #15 Technical Information Package Continuous Improvement of Federal Event Response (CIFER) P16-048-0142312-001-01—CSSP Task 15—July17, 2015, p. 3-2.

5 Survey(s) / Data Collection

5.1 Overview

The data collection process for any lessons learned program involves the capture of information through both structured and unstructured processes—interviews, questionnaires, meetings, AARs, etc. It is through this sharing of experience and knowledge that organizations can grow and improve. Similarly, the collection of data and feedback from the core CIFER Secretariat and WG members, and from the larger federal user community, was identified as a key part of this project—pivotal to the overall success of CSS' contribution to the CIFER program.

This data was to assist with the development of the methodology, taxonomy, submission forms and reporting templates. The Project Authority and contract team indicated early on that interviews with senior management (i.e., DG ERC members and Associate Deputy Ministers (ADMs)) was the preferred option to glean rich information. The adoption of a direct interview technique through bilateral discussion would have allowed the project team to capture in depth information requirements, contextual information and challenges facing federal departments implicated in the Federal Emergency Response Plan governance structure. It would have also provided more information on the issues surrounding implementation of the CIFER program and the "end-user" perspective, giving more credence to the development of the methodology and rating factors for recommendations.

As the project evolved, it became apparent that access to the larger federal department/emergency management community served by CIFER would be difficult, given availability of resources and time. As such, in consultation with PS, it was determined that the most appropriate and acceptable technique for data capture was to construct and administer a survey instrument. Initially, a Questionnaire consisting of 13 questions, was supposed to be sent to the DG ERC members; however, this questionnaire was pared down significantly to three questions. A longer (14-question) questionnaire was distributed to the CIFER WG members, with the expectation that they would confer with their respective departments to glean the information necessary to complete it.

5.2 Questionnaire Design and Administration

The design and administration of the questionnaires were subject of considerable discussion and debate within the project team. Interview questions were initially suggested as part of the Environmental Scan/Literature Review, however this method of information gathering was not considered the most expedient. There was also consideration given to using the questionnaire that was used by a CIFER project team member for a research project conducted as a University of Leicester. This questionnaire was designed to examine how the Federal Government in Canada currently conducts Emergency Management Continuous Improvement, and identify areas in which it could be improved. It gathered opinions from targeted members of the CIFER working group comprising representatives from 19 federal departments or agencies—all of whom were represented on the interdepartmental Director's General Event Response Committee (DG ERC). As such, while many of the same questions used for Mr. Casey's Master's Thesis were used in support of the CIFER Project DG ERC and CIFER WG questionnaires, the questionnaires were

re-administered to CIFER WG members and DG ERC members. These questionnaires were administered via e-mail, as it was felt that this was the most expeditious manner to glean the information required by the project team.

There was a conscious decision to utilise this informal methodology—it was designed simply to capture the judgements and insights from a broad audience. Despite the fact that it was collated and analyzed manually, it still led to some very rich information that was critical to the development of the taxonomy, risk-informed methodology and the conclusions and recommendations of the project team.

5.3 CIFER WG Questionnaire

The CIFER WG Questionnaire (see Annex C), consisted of 14 questions designed to determine the degree of maturity of the lessons learned/continuous improvement programs within the respective WG members' federal departments/agencies. Questionnaires were sent to 16 CIFER WG members and 9 responses were received, for a response rate of approximately 56%. The results of the survey, along thematic lines, are found in the following paragraphs.

5.3.1 Accountability/Responsibility

The overwhelming majority of the respondents indicated that the working and management levels of their organizations share the responsibility for the collection of observations, insights and lessons observed from events and exercises. When asked what level of the organization was responsible and accountable for the implementation of recommendations resulting from these observations, the majority felt that it rested with senior management (Associate Deputy Minister (ADM) level and higher).

5.3.2 Best Practices

Most respondents indicated that their departments had a basic methodology in place, one where lesson are identified, but the organization faces challenges in tracking and implementing improvements. A few of the larger departments—ones with clear emergency management and/or national security mandates—indicated that they have a more developed lessons learned methodology, where lessons are identified and recommendations are tracked, although some challenges are faced in the implementation of complex issues.

Respondents were also asked how their respective organizations set priorities when it comes to implementing recommendations resulting from the continuous improvement process. The responses varied considerably (one of the several challenges of posing open-ended questions on surveys); however, many respondents offered useful insights into their respective programs. Some of the more innovative ideas included de-briefings (hot washes) that are aligned to staff rotations during an event or exercise, as well as exit interviews designed to glean experience and (candid) feedback from departing members in order to improve and ensure continuity of operations. Other respondents mentioned reliance upon regularly scheduled internal reviews of doctrine, policy and procedure to ensure currency and the importance of training and exercises (with an established annual training/exercise calendar) to the lesson learned/improvement process. The exploitation of

software/technology in the capture of lessons learned (Knowledge Management Systems, Lessons Learned Databases, web-based portals, etc.) was also a key theme in the best practices responses. One department had established a "Wiki"-type page on their internal network to allow users to submit recommendations for improvement.

Respondents also underlined the importance of interagency collaboration and information sharing to the success of their respective lessons learned processes, some of whom rely upon liaison officers or formal and informal cooperative arrangements with partner agencies.

Finally, one common theme in this area was the need to assign responsibility for Lessons Learned to a specific person/section in order to ensure the capture of recommendations and the institutionalization of lessons learned for their respective organizations.

5.3.3 Challenges

Respondents were asked to describe any significant challenges with their respective organization's lessons learned systems. Some of the challenges included limited resources (no dedicated staff, lack of funding) available to effectively manage a lessons learned program, a lack of influence to be able to inculcate organizational change, and the inability to effectively collaborate due to policy and/or security constraints. Not only was the reluctance to share data/information between departments highlighted, the technical interoperability (communications, information systems) challenges make it near impossible to effectively do so even if there was the desire to share information. This desire for a Common Operating Picture and better interoperability within the federal family (both classified and unclassified systems) was corroborated in many of the responses to other questions, as well.

5.3.4 Recommendations Affecting Multiple Organizations / Jurisdictions

The survey asked respondents a series of questions regarding how they would handle recommendations that span multiple departments and jurisdictions, and what some of the key considerations might be when dealing with these issues. Many respondents stated that these issues are decided through legislated mandates (i.e., Emergency Management Act, FERP governance structure) as well as formal high-level, strategic committees (ADM EMC/ADM National Security Operations) and operational and tactical level interagency committees. Some federal organizations are embedded within the provinces/territories, employing liaison officers and regional offices to ensure interdepartmental collaboration and cooperation. Interestingly enough, there was little mention of establishing legislation requiring interdepartmental cooperation, or establishing Memoranda of Understanding/Service Level Agreements between departments and agencies. Clearly, interdepartmental collaboration and cooperation were seen to be essential to an effective CIFER program.

5.3.5 Setting Priorities

The CIFER WG members surveyed all came back with very different ideas as to prioritization factors for recommendations. In fact, no two response prioritized all of the 10 factors (Governance, Human Resources, Financial Resources, Training, Competing Priorities, Management/Senior Management Buy-in, Security, Technology, Government Priorities

(i.e., Speech from the Throne) and Policy/Regulatory/Legislative) given the same. Most agreed that the best way to prioritize recommendations was by grouping them into thematic clusters, and there was no clear consensus as to what level that prioritization should occur (i.e., management level or ADM/DM level). In one question, respondents were asked to rank factors from one (1) to six (6) as follows:

- Risk of not implementing;
- Ease of implementation;
- Management buy-in;
- Cost;
- Reach (i.e., how many stakeholders impacted); and
- Government Priorities.

While responses varied considerably, each of the factors were weighted and the results are shown at Figure 7.[20] Of note, the CIFER WG respondents rated the top three factors the same as the DG ERC respondents; however, the importance of the last three factors was perceived differently between the two groups of respondents.

[20] Note the Y axis is a simple mathematical formula based upon the 9 out of 11 responses, respectively, ranking the six factors. The results for all six factors were added up, and then ranks were assigned to each based on the scores provided by the respondents. The lowest number was the first priority, the second lowest number was the second priority, etc.

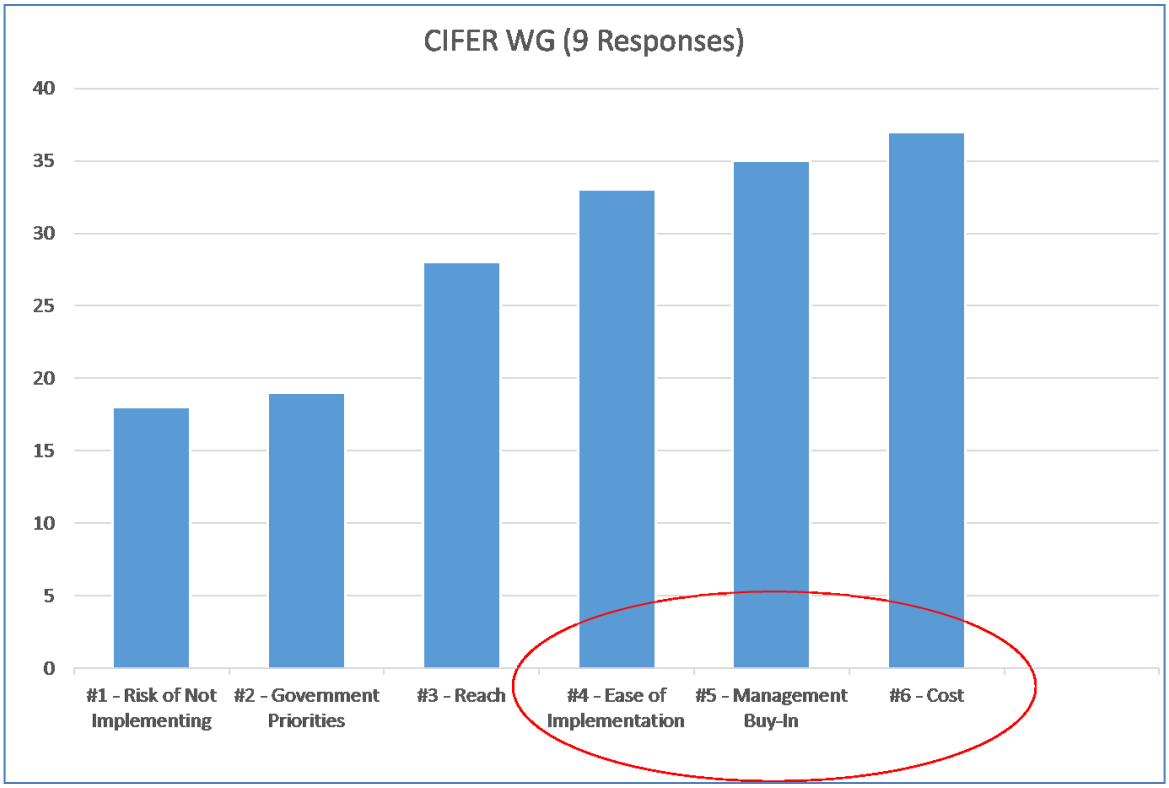

Figure 7: *CIFER WG Response: Relative Importance – Prioritization Factors.*

5.3.6 Other Key Issues

There were other key issues and considerations identified by respondents to the CIFER WG questionnaire. Some respondents mentioned the requirement for a coordinated, "whole of government" approach to the CIFER process, one that brings together all federal, provincial, territorial and municipal partners. Others mentioned the requirement for a Common Operating Picture and an effective interdepartmental communications system (for both classified and unclassified information-sharing). Issues such as interdepartmental cooperation, adhering to the hierarchy of WGs and Committees, and ensuring the development of Strategic Emergency Management Plans (SEMP) were also mentioned in the responses. The CIFER WG was also seen by one respondent as the means by which "working level issues to be brought to the management table." The overarching theme of developing an effective and structured information sharing capability to support the CIFER program was evident in all the responses received.

5.4 DG ERC Questionnaire

The DG ERC Questionnaire (see Annex D), consisted of 3 questions designed to elicit a more strategic view of the federal lessons learned/continuous improvement programs within the respective departments/agencies. Questionnaires were sent to 24 DGs and 11 responses were received, for a response rate of approximately 46%.

5.4.1 Mandate

When asked specifically about the mandate for coordination of Government of Canada lessons learned and continuous improvement action plans, there was consensus (100%) that Public Safety Canada has the mandate. However, as far as the responsibility for implementation of lessons learned, it was unanimously reported that this responsibility rested at the Ministerial level with the individual departments and agencies.

5.4.2 Setting Priorities

Like their CIFER WG counterparts, DG ERC respondents were asked "If you could design an ideal system, what factors do you think would be most important in setting priorities for the implementation of lessons learned recommendations?" The participants were asked to rank six factors as follows:

- Risk of not implementing;
- Ease of implementation;
- Management buy-in;
- Cost;
- Reach (i.e., how many stakeholders impacted); and
- Government Priorities.

Again, like their CIFER WG counterparts, the responses varied widely and no two respondents answered the same. However, the responses were weighted, and the results are shown in Figure 8. Of note, the DG ERC respondents rated the top three factors the same as the CIFER WG respondents; however, the importance of the last three factors was perceived differently between the two groups of respondents.

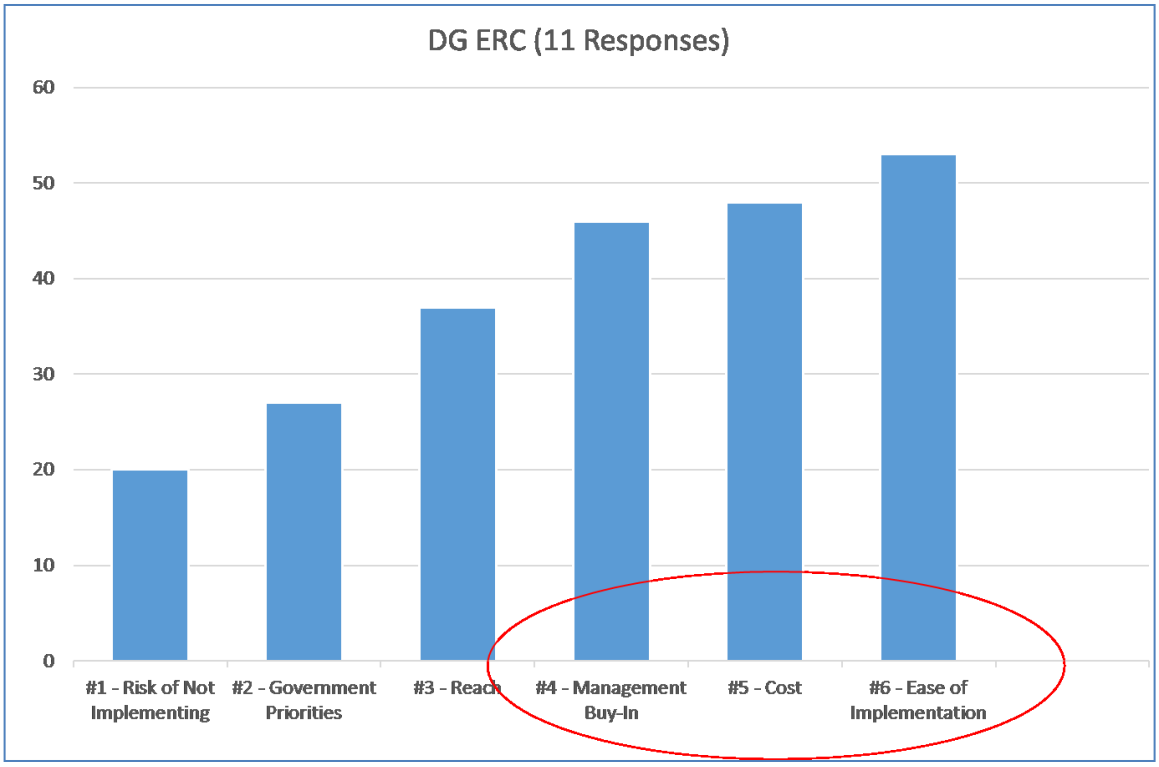

Figure 8: *DG ERC Response: Relative Importance – Prioritization Factors.*

5.4.3 Other Key Issues

In the third and final question of their survey, DG ERC respondents were asked "Are there any other issues related to improving federal event response you believe need to be addressed?" Respondents' answers varied accordingly, due to the open-ended nature of the question; however, there were some recurring themes. Respondents felt that there was still a fear of sharing information, especially where Ministers might be embarrassed and where areas for improvement might be seen as weakness and exploited for political gain. The requirement for a Common Operating Picture and the ability to collaborate and share information (through both classified and unclassified means) were seen to be key issues for the development of an effective lessons learned program. All respondents mentioned the requirement for a Lessons Learned Library where the experience of others can be used to help departments undergoing similar challenges. Coordination and collaboration between committees and WGs were seen to be areas identified for improvement, as well as better integration of federal, provincial/territorial, and municipal government response.

5.5 Analysis

These surveys provided an opportunity for respondents to express their strong support for a standardized lessons learned program / reporting system for the federal family—one that allowed for better communications, information sharing, and collaboration between departments—particularly those with specific Emergency Support Functions (lead departments). Respondents in

both groups emphasized the requirement for a secure means of communication and a Common Operating Picture (COP).

These surveys represent a relatively small sampling of CIFER WG and DG ERC members; moreover, it was evident from comparing responses provided in the CIFER and DG ERC questionnaires that, in some cases, staff officers (CIFER WG members, perhaps) were providing answers on behalf of DGs. Normally, there would be targeted interviewing of respondents conducted for clarification purposes in these instances; however, it was not possible for the project team to accomplish this so it will be up to the CIFER Secretariat to carry out the validation.

5.6 Summary

The questionnaires administered to the CIFER WG and DG ERC members provided some very useful data as to the perceived benefits of a standardized lessons learned / continuous improvement program for the federal event response community. The responses provided the project team with the foundation for the proposed taxonomy. Moreover, the results of the survey pointed to the clear benefits of using a Thematic Model versus an Event-based Methodology in the triaging and risk-informed prioritization of the recommendations submitted to, and analyzed and prioritized by the CIFER WG.

Both surveys provided an opportunity to examine how the community (CIFER WG and DG ERC) would view the prioritization factors. The surveys also brought to light the varying degrees of maturity and effective of lessons learned programs in the federal event response community—individual departments' rated their programs across a broad spectrum ranging from effective and well-established to virtually non-existent. Without exception, all respondents articulated the need for standardization of policies surrounding AARs/AIRs, and the requirement for the collection, analysis, sharing, archiving, resolving and assessing of observations, insights and lessons at a strategic level.

Validation of the survey results with both respondent groups in the form of targeted interviewing and facilitated discussions should be conducted by the CIFER Secretariat to capture and clarify both the commonalities and the unique requirements of participating departments.

6 Methodology and Risk-Informed Prioritization

The DRDC CSS project team was tasked to refine the methodology for the CIFER program as part of it mandate. This was accomplished through participation in meetings, brainstorming sessions and the engagement of key CIFER Secretariat and WG personnel. It was also informed by the environmental scan/literature review, as well as a review of some of the tools and templates employed within the CIFER program. The overarching objective was to recommend a metrics based, risk-informed assessment methodology for recommendations submitted to the CIFER WG.

6.1 Initial Methodology/Process

The CIFER Proposed Program Plan, developed in May 2015, identified six steps involved in the process. The CIFER methodology, as initially conceived, is depicted in the diagram found at Figure 9 below.

- **Provide guidance on minimum standards for CIFER recommendations.** To establish a level of rigor for the types of recommendations submitted to the CIFER process, the CIFER WG will develop basic guidance on minimum standards for recommendations, along with as standard submission template for recommendations. These standards will, at a minimum, ensure that an options analysis was done and that the recommendation was validated and approved internally by the submitting department. A responsible departmental authority should be designated for each recommendation submitted.
- **Collect recommendations.** Submissions from departments to the CIFER process will include individual recommendations and not entire after-action reports. The template form will define very specific information that is required to validate, assess risk, prioritize, implement and track the recommendation; however, it purposefully does not collect detailed information on observed deficiencies. This is designed to minimize the accumulation of explicit information on government vulnerabilities in one place and also helps to streamline the collection of standardized information. In this way, departments retain control of AAR/AIRs under their authority and the CIFER process collects only the information needed to achieve improvements to federal event response.
- **Confirmation and Prioritization of Recommendations.** Before implementation, recommendations submitted to the CIFER process should be confirmed and prioritized by the collective community of DG ERC. To support their decision-making, the CIFER WG will conduct an initial validation and risk-based prioritization of submitted recommendations by consulting widely with those organizations most directly affected by the change, as well as with external expertise where available. This dialogue will encourage innovative solutions and ensure that the WG's assessment on priorities for action is intelligent, informed, and causes no surprises to affected departments when presented to DG ERC. It is also recommended that the DG from the organization most responsible for or affected by the change act as the champion for that recommendation when raised for decision at DG ERC. Once DG ERC has been presented with a list of recommended changes, members will be able to review, further prioritize, and approve the recommendations. Once approved, DG ERC members will appoint a designated responsible

authority for each recommendation (likely following ESFs as a framework). Timelines will be set and the recommendation will then be entered into the CIFER Repository for tracking and reporting. Should member departments not have the resources or authority to complete recommendations endorsed by DG ERC, the issue will belong to the community of DG ERC to resolve collectively or escalate to the relevant ADM-level committee. For those recommendations that are endorsed by DG ERC but more appropriately belong to another committee or group (policy issues or business continuity, for example), a DG ERC member can be appointed to act as a liaison to provide updates for tracking and reporting purposes.

- **Action Plan Development**. Once recommendations are collected, confirmed, and the prioritization is completed, this step concerns the development of an action plan that will be presented and approved by DG ERC. This step is closely aligned to aims and objectives of the CIFER program, in particular on what is to be included for recommendations and what is out of scope. This is also keeping in line with the accountability of DG ERC for the various types of recommendations that are collected, vetted and prioritized, action plan approved, progress tracked, etc. This step of action plan development is primarily concerned with implementation.
- **Tracking and Reporting on Progress.** Progress on the implementation of recommendations being tracked in the Repository will be briefed to DG ERC on a regular basis. The CIFER WG will provide quarterly reports on the implementation of improvements as well as on best practices that emerged over the reporting period. The CIFER WG will also commit to producing an annual report that covers the each of the recommendations that DG ERC sought to implement that year, and the status of each item. Both the quarterly and annual reports provide senior officials with evidence and recognition of work accomplished by their own organizations as well as by the federal response community as a whole. Those organizations that have difficulty getting traction for a particular issue can use this reporting as a tool to either gather support required or to escalate the issue to a higher authority. It will be the responsibility of the DG ERC co-chairs to bring the progress reports forward to DG ERC at the agreed upon intervals.
- **Validation.** As recommended improvements are implemented within the tracking cycle of the Repository, they will be flagged as either validated or not yet validated. This is an important component to ensure that changes that have been made can demonstrate a genuine improvement or achieve a particular effect. If appropriate, improvements in need of validation can be forwarded to the DG ERC Federal Exercise Working Group for consideration in planning exercise objectives. Once the implemented change is validated, either through an exercise, a real event, or through expert assessment, this will be reflected within the Repository to conclude the cycle of improvement for that item.
- **Analysis.** Once there is a sufficient amount of data contained in the CIFER Repository, a trend analysis of recurring lessons learned and best practices can be conducted. This trend analysis can be used to inform planning and policy, and can provide the basis for further improvements or changes in federal event response, as necessary.

The CIFER project team was tasked with conducting research and gathering information to assist in refining the CIFER methodology, focusing primarily on the five steps depicted in the green circle at Figure 9. Initially, four workshops were to be held. The first was to focus on conducting an initial assessment to characterize those recommendations from departmental AARs that should be included within the CIFER program. The second workshop was to develop a methodology to

prioritize those recommendations and to assess risk in doing so. The third workshop was to be a confirmatory session to look at the priority matrix and risk assessment criteria for recommendations. The fourth and final workshop was meant to establish and confirm an accountability path for CIFER recommendations.

Unfortunately, due to operational exigencies, only two workshops were held, as per Section 3 of this report. However, during Workshop #2, the project team did facilitate a CIFER WG brainstorming session on risk-informed prioritization of recommendations, achieving consensus that the ConOps to be developed and presented for DG ERC approval at the end of FY 2015/16 is to address both a risk-informed prioritization of recommendations, as well as a recommended accountability framework for their implementation.

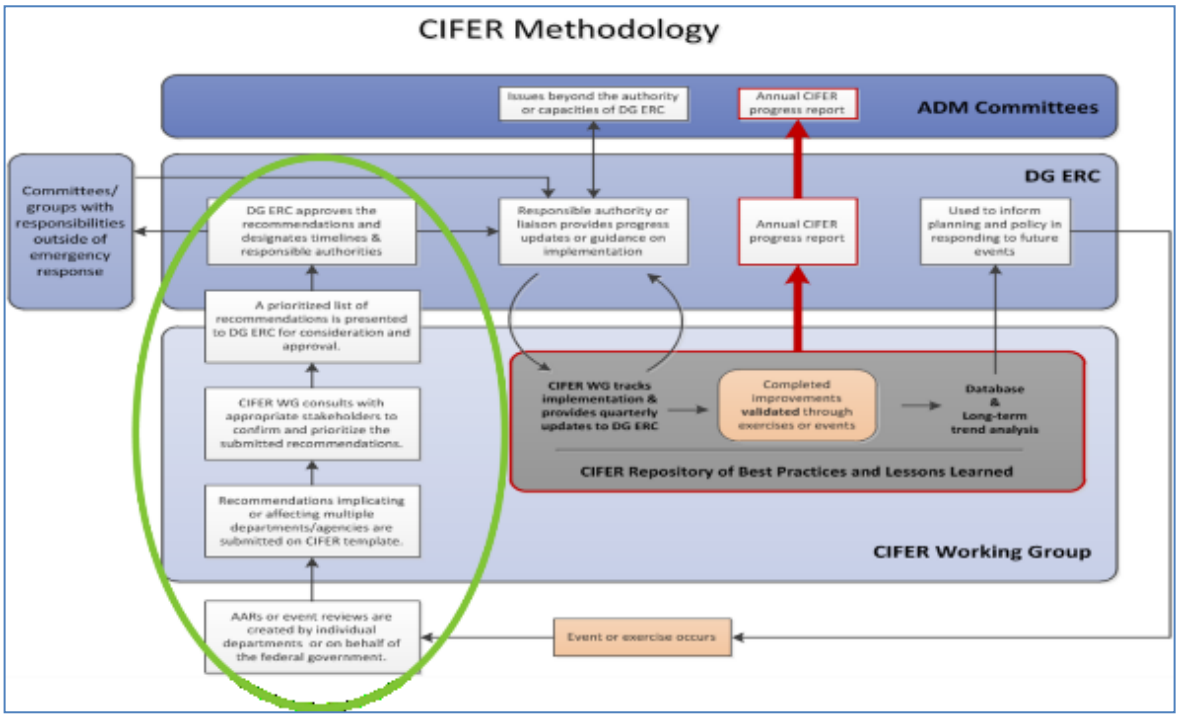

Figure 9: *Initial CIFER Methodology.*

As laid out in the CIFER Proposed Program Plan, Figure 9 above represents the initial depiction of the CIFER methodology (Workshop #1) as conceived working and interacting within the FERP governance structure. The five steps depicted in the green circle represent the main focus of this Project's efforts in developing a prioritization and assessment methodology for recommendations submitted to the CIFER WG.

6.2 Refining the Process

As the project progressed, the CIFER process was further refined by the CIFER Secretariat with the assistance of the DRDC CSS project team. During CIFER Workshop #2, a notional process for the CIFER program was discussed. Part of this process includes the receipt and screening of recommendations from exercises and event AARs by the CIFER Secretariat. These

recommendations are screened to ensure they are properly articulated and fall within the CIFER mandate and program scope. From there, the recommendations are vetted, analyzed and categorized, and potential Offices of Primary Interest (OPIs) (or lead departments/agencies) are identified and assigned by the CIFER WG. The recommendations, along with OPIs, will then be submitted for DG ERC endorsement and approval. Once recommendations are approved, the OPIs prepare and submit their Action Plans to the CIFER Secretariat for vetting and prioritization. The CIFER WG will then ensure institutionalization of the lessons learned through an accountability framework and follow up procedures (a process to be further examined and fleshed out). The CIFER Working Group process is shown in Figure 10 below:

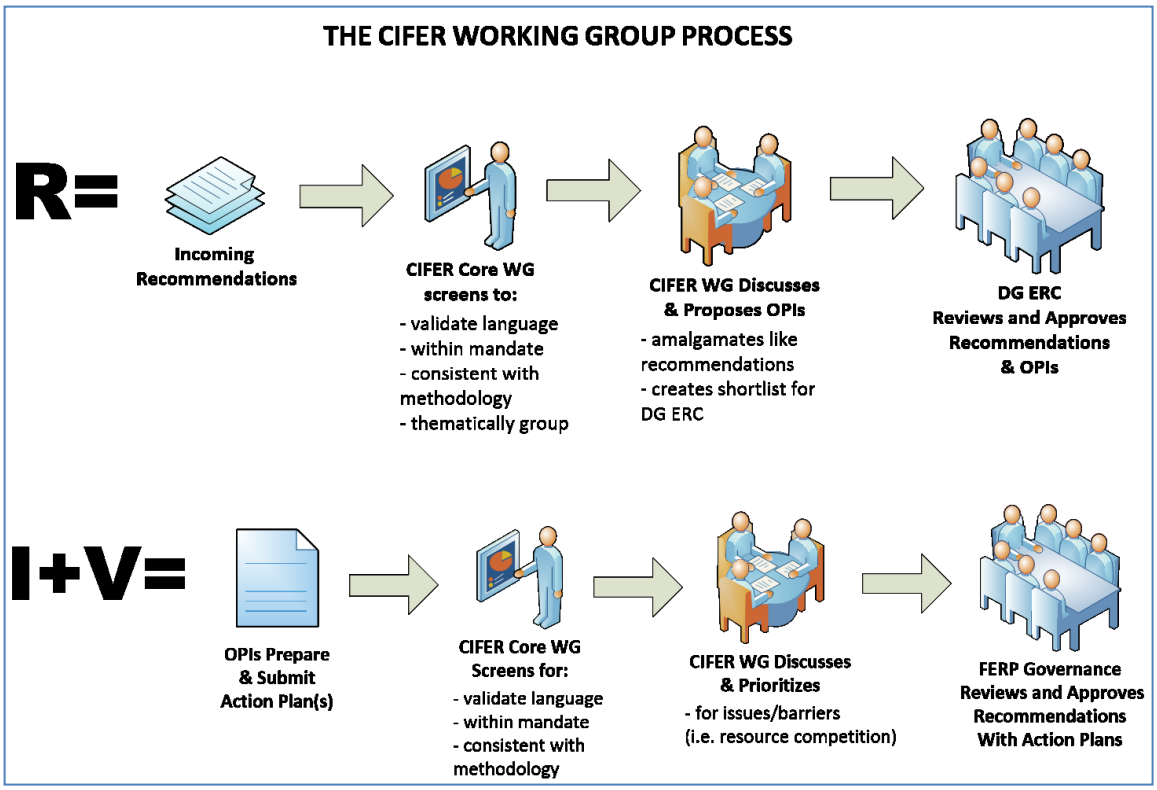

Figure 10: *CIFER Working Group Process.*

6.3 CIFER Core Activities

As the project matured, and upon review and analysis of the information gleaned in the questionnaire responses and facilitated sessions during Workshop #2, the CIFER process was further developed by the project team. The DRDC CSS project team determined that the CIFER WG achieves its mandate through four core activities,[21] simplified as follows:

- Receiving, vetting and categorizing recommendations for improvement of federal event response;

[21] Jim Legere, *Continuous Improvement of Federal Event Response (CIFER) Taxonomy*, DRDC Contract Report, DRDC-RDDC-2016-C039, February 2016.

- Identifying and assigning potential Offices of Primary Interest (OPIs) to develop, manage and implement the recommendations;
- Prioritizing recommendations using a risk-informed approach; and
- Ensuring Action Plan Implementation.

The recommendations were further refined within each of the four functions, culminating in the institutionalization of lessons learned. These core activities are depicted in Figure 11 below:

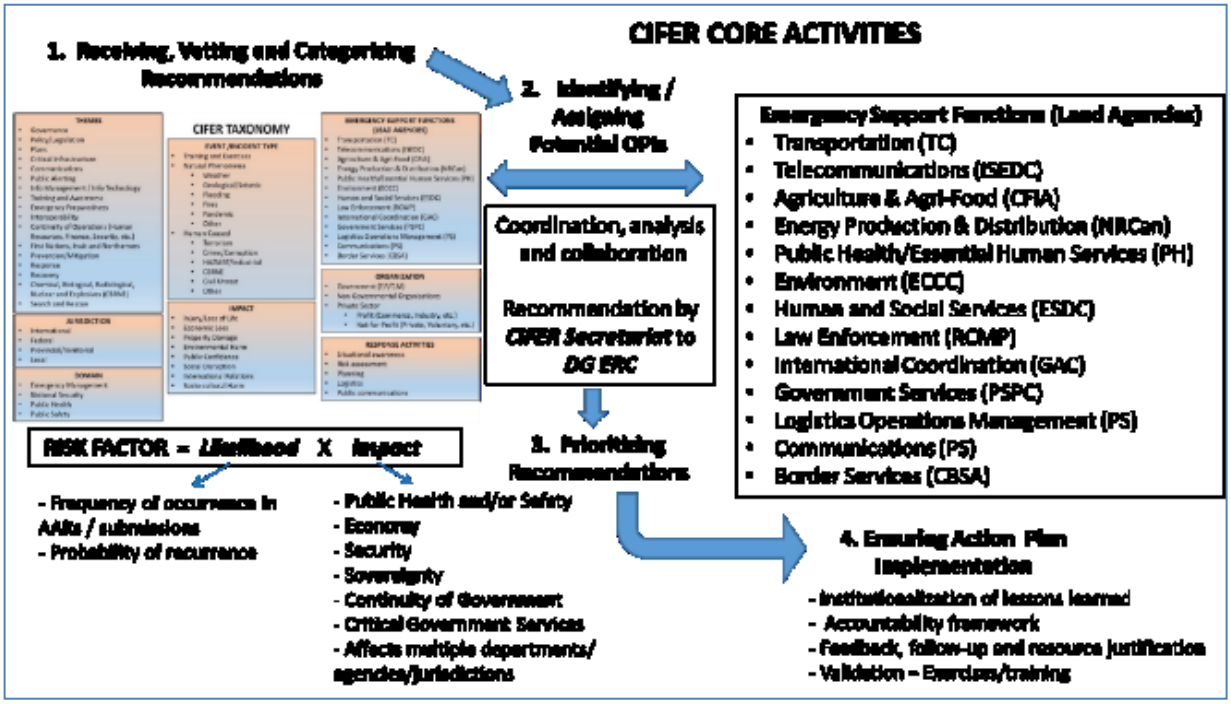

Figure 11: *Refining the Methodology – CIFER Core Activities.*

6.4 Risk-Informed Prioritization

The project team realized that the prioritization of recommendations is perhaps one of the most difficult, and critical, functions of the CIFER program. Determining the relative importance of a recommendation—the "weighting" that should be applied thereto—can be accomplished using a risk-informed approach. Risk can be measured in several ways: as a function of Likelihood and Impact (see Figure 12 below), or using other weighting factors such as the number of people affected, the cost, or the level of public confidence (to name but a few—see Figure 13). The DRDC CSS project team offered these examples to illustrate potential risk-informed prioritization methods; however, the decision as to which factors are most important should be the subject of further discussion and/or another workshop or facilitated CIFER WG discussion to identify an acceptable and appropriate scoring method. Of course, simplicity is also a consideration, given that the current CIFER WG concept relies on departmental representatives who are participating in the program in a voluntary/secondary duty role. The weighting/prioritization process should therefore be simple and relatively easily effected.

Figure 12 below illustrates one method of assessing risk in prioritizing recommendations. The higher the risk, the more weight that recommendation should have as a priority for implementation.

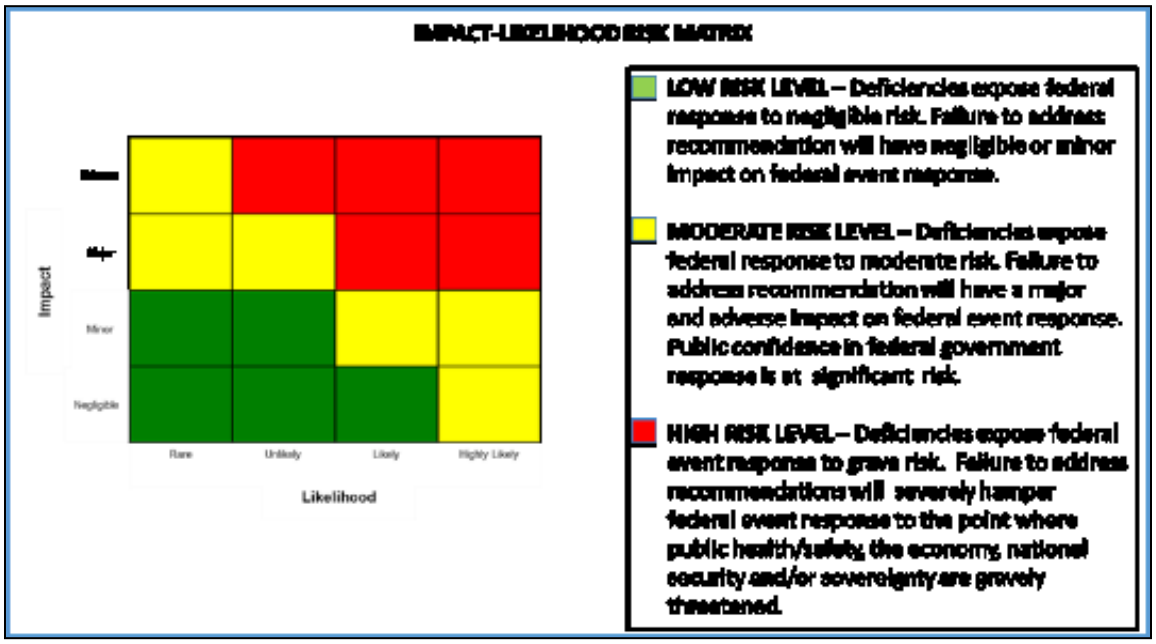

Figure 12: *Sample Impact-Likelihood Risk Assessment.*

Another way to assess and prioritize recommendations is to define certain risk factors (the example below uses Number of People Affected, Cost, and Public Confidence as examples) and determine Risk as a function of Probability and Consequence ($R = f(P,C)$). Each recommendation is then mapped against each of the factors as illustrated in Figure 13 below.

Rating Factor	# People Affected	Cost $	Public Confidence	Likelihood/ Probability
A = 4	Many (> 10K)	Very High (> $10 M)	Poor	Highly Likely
B = 3	Moderate (5K to 10K)	High ($5M to $10 M)	Moderate	Likely
C = 2	Some (1K to 5K)	Moderate ($1M to $5M)	High	Unlikely
D = 1	Few (< 1K)	Low (< $1M)	Very High	Rare

Figure 13: *Sample Risk Rating Factors / "Language Ladder" Assessment Method.*

The measurement of risk in the context of CIFER prioritization of recommendations can be achieved a number of different ways. The examples above were offered to generate discussion and to illustrate the value of a risk-informed approach to AAR analysis and recommendation prioritization. The methods above were developed by project team members in consultation with the project technical authority and will still require validation with key stakeholders to assess its suitability for the CIFER program. Clearly, the methodology and the risk factors to be used should be the subject of a further CIFER WG Workshop or brainstorming session, as previously noted. For example, a full workshop could be dedicated to exploring the appropriateness and applicability of decision support systems (e.g., Progrid).[22]

6.5 Other Potential Rating Factors

The project team, also recommended that the CIFER WG consider using the FERP Strategic Objectives as potential rating factors, as well, as they represent centres of gravity for the maintenance of public safety in Canada:

- To save lives, reduce personal injuries, and protect and maintain public health;

[22] See the Progrid Language Ladder methodology at: Clem Bowman, *Intangibles: exploring the full depth of issues* (Grafiks Marketing & Communications. First Edition, Sarnia, Ontario, January 2005), Chris Jones, "Evaluating Program and Project Performance – Some Lessons from the Canadian R&D Sector." Accessed July 2016 at: http://www.clembowman.info/PDFs/evaluating_perf.pdf.

- To protect property and the environment;
- To maintain law, order and national security;
- To maintain public confidence; and
- To reduce economic and social losses.

Each of these objectives would need to be broken down further and should be the subject of further study. Any recommendations submitted to the CIFER WG that directly impact these objectives should be considered higher priority than others having little or no bearing on these factors.

6.6 Summary

The methodology for the risk-informed prioritization of recommendations that are submitted to the CIFER WG were closely examined by the project team, with a view to ensure analytical rigor based upon scientific principles and defensible processes. The methods will still require examination and validation by key stakeholders (CIFER WG, DG ERC and ADM EMC, specifically). The assessment of risk can be accomplished through myriad models; however, it is important to keep the overall objective of the program in mind: the improvement of information flow and sharing of best-practices, insights and lessons between departments of the federal response family.

When these concepts were presented to DG ERC on 17 February 2016, one DG ERC member observed that that risk methodology #2 might be better served by using a multiplication method, rather than simple addition, since it would illustrate the risk better to senior management. The DRDC CSS project team explained that this is a preliminary methodology and that the model should not be overly complicated. First and foremost, it is a decision support tool, as opposed to a decision-making tool, and these methodologies need to be validated and further refined by the CIFER WG. The DG ERC member also noted that political considerations will always carry the most weight, a factor that no risk management model will likely be able to predict. With additional review, vetting and usability testing involving partner departments, these different types of prioritization methods and assessment schema will prove useful for departmental end-users of the CIFER program, and similarly for member departments tasked with prioritizing the recommendations for DG ERC.

In its nascent stages, the CIFER program should focus first on the collection of information (i.e., focus on encouraging the submission of recommendations to CIFER). Once departments and agencies know that this PS program exists, are comfortable sharing their insights and observations with CIFER, and once there is sufficient data accumulated to allow for effective analysis, then, perhaps, the CIFER Secretariat/WG can be more selective and discerning in their acceptance and prioritization of recommendations. In other words, while there obviously must be some minimal standards applied to recommendations submitted to the CIFER WG, they must not be so rigorous as to dissuade departments and agencies from submitting recommendations.

7 CIFER Forms and Templates

The DRDC CSS project team reviewed the artifacts that may be used by stakeholders involved in the CIFER WG and the recommendation submission process. These artifacts included the common submission template and tools for progress reporting that allow recommendations, lessons learned and AAR information from stakeholders to be captured and reviewed. A series of recommendations are provided in this section regarding improvements that will help facilitate the role and work of the CIFER WG and its associated artifacts. These recommendations are supported by findings made during the environmental scan / literature review (as noted at Section 4), discussions with stakeholders, working group outcomes, and Human Factors expertise. In addition, the team reviewed available information technology solutions that may provide these artifacts in an accessible format to ensure efficiency and effectiveness as described in Section 10 of this report.

Figure 14 visually represents the workflow to be followed and references the artifacts to be used to support the CIFER recommendation submission process. In summary, an event triggers the following process: Inter-departmental AARs are completed; if the AAR results in a recommendation that cannot be completed internally then the CIFER Recommendation Checklist is completed. If the result of this checklist is a submission to CIFER, then the CIFER Recommendation template is completed and submitted. At this point in the process, the individual department has completed all steps and the recommendation is handed off to the CIFER WG. The CIFER WG then analyzes and prioritizes each recommendation (based on a systematic approach) and reports the results quarterly to the DG ERC (see Figure 14).

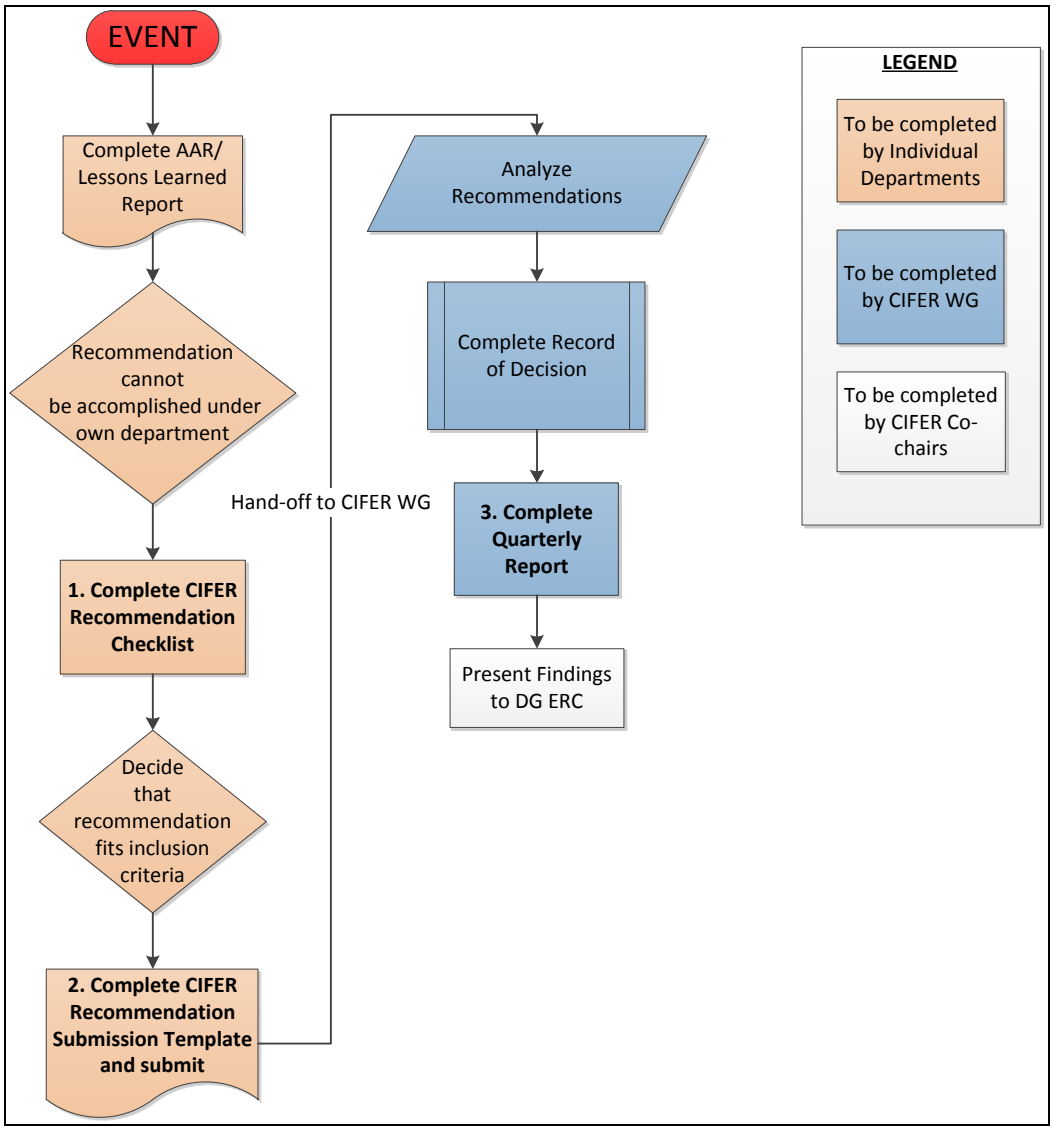

Figure 14: *CIFER Recommendation Submission Process. CIFER artifacts presented and reviewed in this report are numbered and bolded.*

It should be noted that the recommendations provided in this report are based on the evaluation of each artifact via informal feedback from the CIFER WG and by a Human Factors expert. The intention was to formally obtain and integrate end-user and stakeholder feedback; however, this did not occur within the scope of this project because of constraints that included limited access to stakeholders due to a Canada-wide event (Syrian refugee crisis) that had a significant impact on GOC operations and CIFER WG personnel availability.

Artifacts were created by members of the CIFER WG and were reviewed by the project team. The artifacts reviewed coincide with the numbers in Figure 14 (1–3) and included:

1. CIFER Recommendation Checklist (Annex E);

2. CIFER Recommendation Submission Template (Annex F); and

3. Quarterly Report to DG ERC (Annex G).

Note that two artifacts are an integral part of the process and include inter-department AARs and CIFER Record of Decisions. Although these artifacts are included as part of the process (see Figure 14) they are not within the scope of the current review as they are used independently of the CIFER program. Recommendations for each artifact can be found in the following sections.

7.1 Review of CIFER Recommendation Checklist

The purpose of the CIFER recommendation checklist is to provide those who wish to submit a recommendation to CIFER WG with an easy and efficient way to validate that the recommendation or issue is in line with CIFER's mandate. This Checklist is for the submitters' own use and is not received by anyone in the CIFGER WG. The Checklist was reviewed and issues were identified which resulted in seven (7) recommendations that will improve the process and checklist. These can be found in Table 4. Note that all recommendations made regarding the CIFER Recommendation Checklist should be validated with the user community.

Table 4: *Issues and Recommendations for "CIFER Recommendation Checklist".*

ID #	Issue	Recommendation
1	**Inclusion criteria is unclear** Once the checklist is completed there is still no clear indication that the recommendation should or should not be submitted to CIFER. For example, if the answers to all questions are "NO"—should the recommendation still be submitted?	1. Provide one line item at the beginning of the form that enables the user to decide if they should continue to submit the recommendation or not. For example, if the most critical item is that the recommendation impacts multiple departments—the question should be asked and if the answer is "YES" then the rest of the form should be filled out and submitted regardless of the answers to the rest of the checklist. 2. If the inclusion criteria is a combination of factors—explicitly state this and have the users either submit the recommendation regardless of the answers to the checklist OR automate the process and have the inclusion criteria be determined automatically based on the users' answers to the checklist criteria. The end result for the user would be "**Submit** or **Do Not Submit**".
2	**Align with final CIFER approach** Given that the CIFER Approach is	Ensure the inclusion criteria is directly related to the approach taken (i.e., Thematic or Event based). Once the approach is chosen, the checklist criteria

ID #	Issue	Recommendation
	not finalized this will impact the inclusion criteria.	should be revised to mirror the criteria required to support an efficient review process.
3	**Require more user input**	A human factors (user-centered design) process should be relied upon to ensure that the checklist supports the users, is easy to use and is efficient. (See Recommendation 10.4 in the Conclusion).
4	**Checklist may be too onerous as is**	It is recommended that the checklist be significantly shortened based on prioritized criteria. There could be a few items attached to the beginning of the submission template to reduce the number of forms required. As it is, the checklist may be viewed by users as an arduous process that does not have a clear outcome, although this must be validated with users during interviews/focus groups in the future.
5	**If there is exclusion criteria this should be highlighted**	It is recommended that if there are any "exclusion" criteria that these be at the forefront and highlighted to save the users time and reduce frustration. For example, if the users answer "YES" to the question "Can the recommendation be accomplished under your department's current mandate?" should this exclude the recommendation from further submission?
6	**Instructions are unclear**	If CIFER would like recommendations submitted regardless of the answers to this checklist this should be explicitly stated.
7	**Parts A, B and C are unnamed and seem to lack "meaning"**	If Parts A through C have any meaning related to inclusion criteria they should be named and state any instructions associated with each Part. Each Part should be "chunked" in a meaningful way; i.e., Part A should contain items that are significantly related to each other.

Once the checklist is completed and the recommendation is deemed to be relevant to the CIFER WG process, the user would then continue to complete the CIFER Recommendation Submission Template. This Template is introduced along with recommendations for improvement in the next Section 7.2.

7.2 Review of CIFER Recommendation Submission Template

Once the CIFER Recommendation Checklist has been completed and it is determined that the recommendation should be submitted to CIFER, the user would complete the CIFER Recommendation Submission Template. Therefore, the purpose of the CIFER Recommendation

Submission Template is to provide those who wish to submit a recommendation to CIFER WG with an easy, efficient and consistent way to do so. The completed Submission Template is received by the CIFER WG Secretariat, who will house the recommendations in preparation for each quarterly review. This Template would ensure that the recommendations that are submitted are articulated in a way that is consistent across all departments, making it a more efficient process for the CIFER WG to review each recommendation. The Template was reviewed and issues were identified which resulted in five (5) recommendations that will improve the process and checklist. These can be found in Table 5. Note that all recommendations made regarding the CIFER Recommendation Submission Template should be validated with users.

Table 5: *Issues and Recommendations for "CIFER Recommendation Submission Template".*

ID #	Issue	Recommendation
1	**Process may be too onerous**	It is recommended that the template be merged with the checklist into one form to reduce any burden on users and increase the likelihood of submissions. This needs to be validated with users during interviews/focus groups in the future.
2	**The process and related artifacts have the user stating the Recommendation in two distinct places (Checklist and Template).**	The final item to be completed in the Template is the actual recommendation; however, the user is then required to fill the Submission Template which also has a requirement to provide the recommendation. To reduce the burden on the user, it is recommended that the user should only be required to iterate the recommendation once (e.g., only on the Submission Template).
3	**Align template with final CIFER approach**	Ensure the metadata associated with the submission template is directly related to the approach taken (i.e., Thematic or Event based). Once the approach is finalized, the metadata should be revised to mirror the data required to support an efficient review process.
4	**Priority categories are vague**	More information may be required for users regarding what the CIFER WG considers the Low, Medium and High priority recommendations.
5	**Point of Contact**	Although name and organization fields are included in the Source data, there is no explicit request for contact information. It is recommended that an email and phone number be requested on this template in the case that follow-up for further information is required.

Once the template is completed and submitted to CIFER, the CIFER WG secretariat would receive the submissions and house them until the CIFER WG gathers quarterly to review, analyze and prioritize each based on the systematic approach selected. The recommendations that the CIFER WG deem to be relevant to DG ERC are analyzed further and reported using the Report template. The CIFER Quarterly Report to DG ERC is introduced along with recommendations for improvement in the next Section 7.3.

7.3 Review of CIFER Quarterly Report to DG ERC

The CIFER Quarterly Report to DG ERC would provide the stakeholders with a situational awareness of the issues at hand, with the highest priority recommendations being vetted through CIFER.

It should be noted that situational awareness (SA) is goal-orientated (elements of the environment that people need to be aware of are determined based on the goals associated with the task at hand), and SA directly supports the cognitive processes of the end-user. The most useful way of supporting decision making is to create a system interface that is effective at creating a high-level of SA. Therefore the dashboard that provides the DG ERC with SA should allow them to:

- Perceive the important elements in the environment;
- Comprehend the current situation; and
- Project future status.

The current quarterly report may aid in maintaining SA by providing a visual artifact and overview of the number of recommendations by various categories including; by event, schedule (on time, delayed, at risk), categories (e.g., policy, tools, training), etc. It is clear that the DG ERC will require some form of SA artifact or report; however, input from this user group is imperative to the final design of a useful report or dashboard. Four general recommendations are provided in Table 6; however, the highest priority would be to obtain feedback from the end users of this information prior to altering the design of this report in the future. Note that all recommendations made regarding the CIFER Quarterly Report should be validated with stakeholders and end users.

Table 6: *Issues and Recommendations for "CIFER Quarterly Report".*

ID #	Issue	Recommendation
1	**If data captured in the report will roll-over into following reports, a "version control" number should be added to the report.**	Add a Version Control number to each report generated and make current version easily accessible and denoted. Previous versions should also be archived and accessible.
2	**User access may need to be restricted (e.g., "Read-Only" for some users).**	Ensure that critical information cannot be modified or deleted inadvertently or arbitrarily.

ID #	Issue	Recommendation
3	**Ensure that the data captured and presented is adequate**	Stakeholder feedback should be obtained in a semi-structured interview or focus group format. This will ensure that the data being presented to the DG ERC is applicable and aligns with their requirements.
4	**Reduce the amount of information provided**	From discussions with the CIFER WG, it was learned that the DG ERC has a limited amount of time to provide to the CIFER WG report. The requirements captured as a result of recommendation #3 should be prioritized. The items with high priority should be presented in a format that is easily accessible and scalable so that details associated with each item presented can be easily accessed.

7.4 General Recommendations

Recommendations captured by the Human Factors expert that could be applied to the process of submitting recommendations to CIFER (and not specific to any artifact reviewed) are captured in Table 7.

Table 7: *General Human Factors Issues and Recommendations for CIFER Recommendation Submission Process.*

ID #	Recommendation
1	**Support Tools:** Guidelines should be created and provided to users regarding the process and criteria for writing recommendations, providing evidence of completion to each group of stakeholders. These guidelines may need to be customized based on the group type and/or the users' level of involvement and knowledge.
2	**CIFER Continuous Improvement Process:** In order to ensure CIFER continuously improves, a CIFER Satisfaction Survey should be created and distributed semi-annually or annually.
3	**Ensure CIFER transparency:** Create an end-of-year CIFER report or newsletter to highlight successes, barriers, changes to the process, tools etc. to be distributed to all users.
4	**Responsibility Assignment Matrix:** Roles and responsibilities with regards to the submission of recommendations and interactions with CIFER across all departments should be explicitly stated and distributed along with any improvements/changes/updates to the process or tools on a continuous basis.

ID #	Recommendation
5	**Training:** Training and related materials regarding the submission process should be provided to all stakeholders and end users.
6	**Process Automation:** To reduce human error and workload, a method for automating the input, review, analysis and reporting of the recommendations should be developed.
7	**Validate the process and materials:** Conduct tabletop exercises for the CIFER process and artifacts to validate and obtain buy-in from end-users.
8	**SharePoint:** If SharePoint is the chosen technology for submission criteria for access should be defined; maintained and user access lists should be routinely verified; improving and simplifying its functionality; training and providing access to more users; defining better the responsibilities of who enters tasks and information into the platform; and assigning more than one person to enter and manage records
9	**User-Centered Design:** It is recommended that Human Factors Design Guidelines are followed in the final process and design of these artifacts to ensure ease of use, usability and effectiveness are embedded in the design. Briefly, the following steps should be taken for the design of the process and each artifact it encompasses (Note—some steps have been partially completed); Define the Problem (partially complete) Identify all of the users and stakeholders (partially complete) Use Case Selection (A common use case should be selected and used in table top exercises to validate prototypes with end users) Information Extraction (requirement to interview and validate the artifacts and process with stakeholders) List Constraints on Design (partially complete—require technology to be chosen) Verifying that the Design Fits the Intended Population (partially complete) Product Testing and Validation (not complete)
10	**Informal Process:** The proposed process is a "formal" one, but there should also be an entry into the process informally from other organizations not formally part of CIFER (e.g., academia, the public). This could be as simple as access to the web portal and submission of an observation informally.
11	**Point of Contact:** A CIFER point of contact should be provided for all stakeholders to reach out to regarding any questions or concerns they have with the process or tools.

8 Information Management / Technology Solutions

8.1 General

The establishment of a Repository that provides the means to track the implementation of recommendations, a database to enable long term trend analysis, and a resource to inform future event response planning.is a key CIFER program objective. As the CIFER program matures, consideration can be given to more advanced databases and information systems, such as those that are in use within the Department of National Defence (DND) and Canadian Armed Forces (CAF). Recently, the CAF published a Joint Publication outlining their lessons learned program[23]. This publication provides an excellent reference source for different types of databases that can support a continuous improvement/LL program.

A LL database (LLDB) is a collection of LL that is available for viewing by a wider audience. Such a database would contain information that the federal event response community wishes to share and can range from a paper file to a computer-based system. LLDBs are either open or managed:

- **Open LLDB**. An open LLDB accepts most data without delay, but does not validate it or have any criteria that must be met. An open LLDB is a repository of information contained in reports and returns that has not necessarily been analyzed or validated. It is used by LL specialists to research trends and deficiencies during analysis of operations, exercises, and activities. An example of an open LLDB is the LL KMS (Canadian Armed Forces).
- **Managed LLDB**. A managed LLDB contains data from dedicated research, investigation, or analysis that is validated and based on facts. It is used by SMEs to identify corrective action for identified shortcomings and capability gaps. Managed LLDBs are more specialized databases and are used to track implementation of corrective action. An example of a managed LLDB would be the Royal Canadian Air Force Flight Safety System.

8.2 Developing an Initial Capability

As an initial capability, the CIFER program should develop a simple database that allows the user community to submit recommendations through a front end interface, and also allows the user to search through existing lessons learned. Such an application should be web-based and would require an administrative dashboard for the core CIFER Secretariat to be able to extract the recommendations lesson learned application submitted by user and also to provide status of each recommendation.

One means of developing this platform is to use SharePoint. SharePoint is a web application platform in the Microsoft Office server suite. It combines various functions which are traditionally separate applications: intranet, extranet, content management, document management, personal cloud, enterprise social networking, enterprise search, business intelligence, workflow management, web content management, and an enterprise application

[23] Canadian Forces Joint Publication (CFJP) A2 Lessons Learned, dated 23 April 2015.

store.[24] It can be developed on top of the Office of Critical Infrastructure Protection program. SharePoint is good for developing forms and storing information but it isn't a relational database. Moreover, using SharePoint, it will take considerable effort to develop an administrative dashboard is user friendly. However, this may be a good start as a prototype until the CIFER programs gains visibility.

Another approach would be to develop the front end using HTML5 and JavaScript. This will create a web interface that is user friendly and easy to navigate. The backend can be developed using ASP.net. This will save considerable costs over a longer period of time as it requires no other licenses other than a Windows Hosting fee. The creation of a prototype, using a Level 2 database developer and a programmer, would be relatively inexpensive.

8.3 Taxonomy

The project team developed a preliminary taxonomy for the CIFER program and, in doing so set the stage for the development of a risk-informed methodology for prioritizing recommendations brought forward by federal departments and agencies to the CIFER Working Group (see Figure 15).[25] In a general sense, a taxonomy refers to the study of classification or to methods of classification. The CIFER taxonomy was created to assist PS in organizing and managing knowledge and information pertaining to the CIFER program; it provides a common language and frame of reference. The taxonomy should prove useful in the development of metadata for any database or knowledge management system that is designed to support the CIFER program.

[24] "What is sharepoint?" *Microsoft Office 2010 Answers*. Microsoft.
[25] Government of Canada, Document No. 5842-012 Version 01, Continuous Improvement of Federal Event Response (CIFER) Taxonomy, dated 05 February 2016.

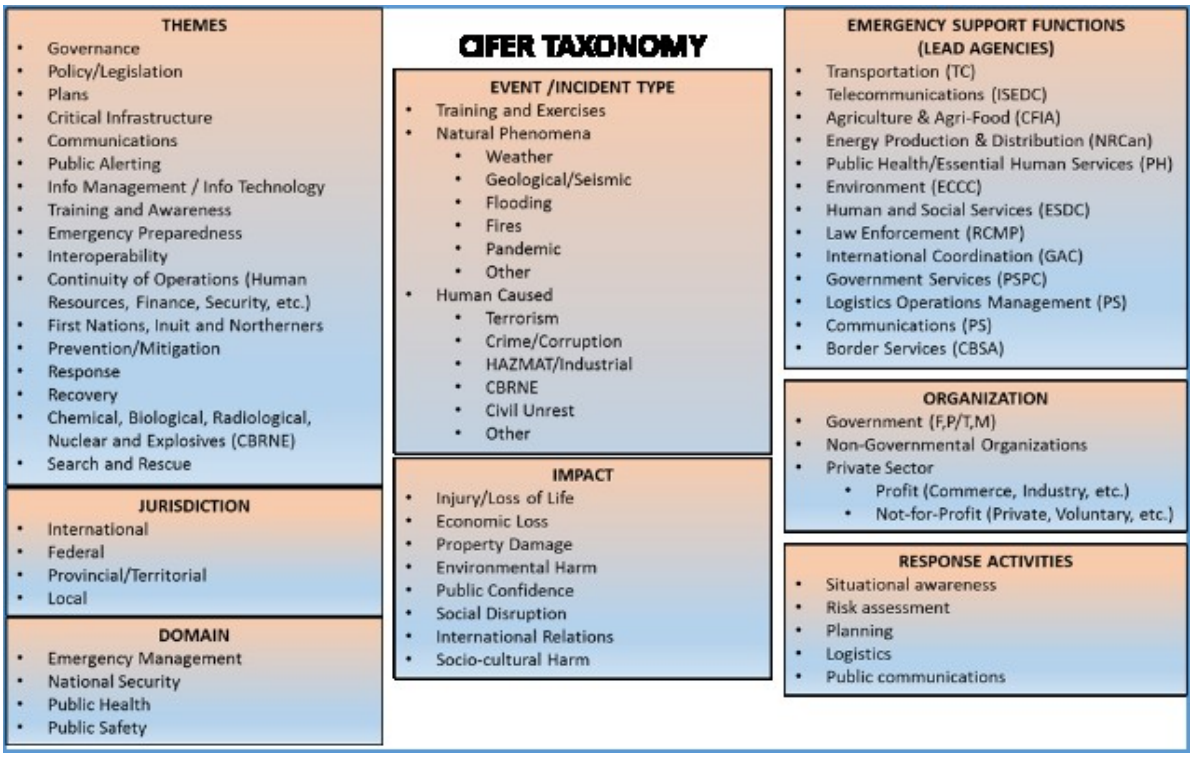

Figure 15: *The CIFER taxonomy can be used to establish meta-data tags for the Lessons Learned database.*

8.4 Other Considerations

The development of an accessible and automated information repository / lessons learned database that serves the federal event response community is clearly a priority program objective. In order to ensure the unique requirements of the federal event response community are addressed, the development of any such tool must take into account the Human Factors issues and recommendations as outlined in Section 7 of this report; in other words, it must be a collaborative and inclusive effort.

While security considerations are always of concern, particularly in terms of the aggregate of the data held in such a repository, in order to achieve the most benefit for the user community, recommendations ought to be sanitized of any classified material, and submitting departments must work closely with their respective Departmental Security Officers (DSOs) to ensure appropriate declassification of information.

Shared Services Canada has the mandate for the provision of information technology support to the federal government and should be consulted to determine what support they can provide in the development of this capability. Finally, consideration should be given to collaboration with the larger Emergency Response community at the provincial, territorial and municipal levels, and to potential partnering with academic and/or research institutes with compatible public safety programs.

8.5 Summary

The development of a repository that provides the means to track the implementation of recommendations, a database to enable long term trend analysis, and a resource to inform future event response planning is a key CIFER program objectives. This system should be automated as much as possible, with a simple, user-friendly web-based interface. As the CIFER program evolves and matures, the CIFER program can consider the development of an advanced capability, such as the knowledge management systems used by DND/CAF. Initially, however, simple, cost-effective solutions are available through the use of Microsoft SharePoint, or by contracting out the development of a tailored, web-based prototype. Other considerations in developing this capability include consultation with stakeholders to ensure unique requirements and human factors issues are captured during the development phases, ensuring security and classification issues are addressed, determining what support can / should be provided by Shared Services Canada or through other similar programs like the OCIP, and, developing partnerships with academic or research institutes that offer compatible public safety programs.

9 Conclusion

The CIFER program was designed to address the lack of any systematic process that allows for information sharing within the federal event response family; specifically, the sharing of best practices and lessons learned. The development of a centralized repository where this information can be aggregated, accessed and studied to support trend analysis, help guide future planning and facilitate program improvement is central to this program. As a WG accountable to DG ERC, the CIFER program has the mandate to collect and analyze recommendations or improvement actions from AARs/AIRs which implicate or affect multiple federal organizations, emphasizing issues that fall along the 'seams of government'.

Over the course of this seven month project, the DRDC CSS project team—consisting of DRDC CSS staff and contract personnel—participated in meetings, brainstorming sessions and workshops, engaged key stakeholders from various federal government departments and gathered and analyzed survey data, information and artifacts from the CIFER Secretariat. Key contributions included assisting the CIFER Secretariat and WG in the development, conduct and analysis of two CIFER WG Workshops, the conduct of a literature review / environmental scan of lessons learned "best practices," the development of a taxonomy and the provision of advice and guidance on a risk-informed methodology for prioritizing, selecting and following through on recommendations submitted to the CIFER WG. The project team also examined standardized templates for the submission of recommendations, tracking and reporting mechanisms for DG ERC, and provided a suggested template for the development of a CIFER ConOps (See Annex H).

DRDC CSS support to the project yielded positive results, in that the project team provided informative solutions and recommendations to support evidence-based decision making. This final report summarizes the information gleaned on "best practices" related to lessons learned programs, such as managing outcomes of the AAR data capture process, methodology for selecting recommendations, the development of standardized templates for the submission of recommendations, suggestions for risk assessment methodology and the prioritization of gaps, and recommendations on tools and techniques for tracking recommendations and performing trend analysis. This report will hopefully provide a foundational document for the development of the ConOps and be used to gain traction on establishing an effective, much anticipated and much needed federal lessons learned program. Recommendations intended to assist PS in achieving this goal are offered in the following section.

The next steps in the evolution of the CIFER program are to submit the finalized ConOps to DG ERC and ADM ERC by 30 April 2016 and then validate it over Fiscal Year 2016/17. It is anticipated that, concurrently, PS will seek technological solutions for analytical and information management support to the CIFER program. If required, DRDC CSS stands ready to provide continued support to the project in the form of further developing analytical tools and a web-based lessons learned database prototype.

10 Recommendations

The following recommendations are offered to assist in growing the CIFER program into an effective continuous improvement and lessons learned capability. Validation of these recommendations with the CIFER WG, and approval by the DG ERC, will be required since implementation of most involves the allocation or re-allocation of resources.

10.1 Develop a Database

The CIFER WG should champion the digitization of plans, resources, policies and learning resources for the emergency management / public safety community. Chief among its efforts should be the creation of a library of lessons learned and the employment of an automated tool that can be used at all stages of the continuous improvement process. Also, social media such as Twitter, Pinterest, Facebook, etc. should be exploited as much as possible in recognition of changing attitudes and engagement methods. The old adage "build it and they will come" is strikingly *à propos* as it pertains to this recommendation. Simple, cost-effective solutions are available through the use of Microsoft SharePoint, or by contracting out the development of a tailored, web-based prototype. In order to ensure the unique requirements of the federal event response community are addressed, the development of any such tool must take into account the Human Factors issues and recommendations as outlined in Section 9 of this report; in other words, it must be a collaborative and inclusive effort. Finally, consideration should be given to ensuring security and classification issues are addressed, determining what support can / should be provided by Shared Services Canada or through other similar programs like the OCIP, and, developing partnerships with academic or research institutes that offer compatible public safety programs.

10.2 Establish AAR Policy and Standards

Using the FERP governance framework (i.e., through the ADM EMC or DG ERC) establish policy and standards for the completion of AARs and the collection of observations, insights and lessons. In its nascent stages, the CIFER program should focus first on the collection of information (i.e., focus on encouraging the submission of recommendations to CIFER). Once departments and agencies know that this PS program exists, are comfortable sharing their insights and observations with CIFER, and once there is sufficient data accumulated to allow for effective analysis, then, perhaps, the CIFER Secretariat/WG can be more selective and discerning in their acceptance and prioritization of recommendations. In other words, while there obviously must be some minimal standards applied to recommendations submitted to the CIFER WG, they must not be so rigorous as to dissuade departments and agencies from submitting recommendations.

10.3 Create a Shared Accountability Model

A permanent CIFER Secretariat, comprised of staff resourced and supported by departments with lead ESF roles should be established. One of the first tasks of the Secretariat would be to ensure the justification and rationale for the CIFER program is attributed to emergency management

policies, legislation and frameworks, if only to ensure the program is integrated into existing planning processes and its implementation begins to take hold. Where it concerns CIFER WG management, staffing should be such that the right skill sets are matched to tasks, and focused on analytical skills versus administrative duties and "process" or "contract" management. The CIFER Secretariat might be managed outside of the GOC so that it would be better positioned to address the full spectrum of public safety and security challenges, emerging trends or historical case studies, and would not simply be focused solely on events and exercises. Such a model could provide the unique opportunity to serve the larger national emergency management community and might incentivize the submission and sponsorship of recommendations, either through positive reinforcement like recognition or access to additional (pooled) resources, or through other means of persuasion such as tying CIFER participation to the Management Accountability Framework or re-allocating budget resources to departments and agencies willing to submit and sponsor recommendations. This would put the emphasis on shared accountability and create a governance framework that wholly leverages community support.

Once the program has matured somewhat, consideration should also be given to holding conferences, seminars and other supportive events that encourage the earnest exchange of ideas amongst stakeholder in the Emergency Management Community of Practice. This would be of exceptional benefit to the CIFER Program.

10.4 Validate CIFER Forms and Templates

It is recommended that Human Factors Design Guidelines are followed in the final process and design of CIFER forms and templates, as outlined in Section 7 of this report, to ensure ease of use, usability and effectiveness are embedded in the design. These should be validated at all levels of the FERP governance model, and feedback on the viability of these forms and templates should also be solicited from end-users as part of the data collection process.

10.5 Validate CIFER Project Methodology and Risk-Informed Prioritization

Validation of the survey results with both the CIFER WG and DG ERC respondent groups in the form of targeted interviewing and facilitated discussions should be conducted by the CIFER Secretariat to capture and clarify both the commonalities and the unique requirements of participating departments. Similarly, although the methodology and risk-informed prioritization models were developed by project team members in consultation with the project Technical Authority, they will still require validation with key stakeholders to assess their suitability for the CIFER program. The methodology and the prioritization models should be the subject of further CIFER WG Workshops or brainstorming sessions.

10.6 Involve CIFER in Training and Exercises

The key to continuous improvement is continuous training, especially in the emergency management/event response community, where preparedness is such a critical component of success. Routine exercises and training events, at the tactical, operational and strategic levels must be programmed to test procedures, capabilities and readiness levels, and to ensure

interoperability between key federal, provincial, territorial and municipal agencies. The CIFER WG must be an active participant in the planning, development, execution and assessment phases of training and exercises at the federal level.

10.7 Conduct Training for CIFER WG Members

There are a number of handbooks developed by lessons learned organizations that provide invaluable information on continuous improvement and lessons learned programs. These should be exploited to develop an orientation/training course for new CIFER WG members, and for regular (annual) refresher training of all CIFER WG members and the decision-makers supporting the program. The use of LL Program experts (DRDC, FEMA, JALLC, etc.) from other agencies would enhance the professional development of the CIFER WG as well.

10.8 Create CIFER Partnerships

The continued engagement of and partnering with the academic and scientific community—not only DRDC and the Centre for Security Studies, but also other organizations, institutes or groups involved in research and advocacy in the public safety and emergency management field—is essential to the credibility and sustainability of the CIFER program. These partnerships can assist by bringing to bear the right tools to examine and to help resolve the "wicked problems" found in the complex emergency management and public safety environment.

10.9 Finalize and Validate ConOps

The CIFER ConOps is slated to be finalized by 30 April 2016 and validated throughout fiscal year 2016/17. This will allow time for departments (CIFER WG members and proponents included) to transition back to normal operations following the Syrian Refugee Operations and Exercise Cascadia Rising in June 2016. The AARs that will inevitably be developed as a result of these two events can and should be used as test cases for CIFER program validation.

This page intentionally left blank.

References

Analyzing Qualitative Data, University of Wisconsin, http://learningstore.uwex.edu/assets/pdfs/G3658-12.pdf (Accessed March 2016).

Braun, V. and Clarke, V., "Using thematic analysis in psychology," *Qualitative Research in Psychology*, Vol. 3 Issue 2 (2006), p77–101.

Bowman, C.W., *Intangibles: exploring the full depth of issues* (Grafiks Marketing & Communications. First Edition, Sarnia, Ontario, January 2005).

Canada, *An Emergency Management Framework for Canada, Second Edition* (Ottawa: Public Safety Canada, 2011). www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-mngmnt-frmwrk/mrgnc-mngmnt-frmwrk-eng.pdf (Accessed May 2016).

Canada, *Federal Emergency Response Plan January 2011* (Ottawa: Public Safety Canada, 2011). http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/mrgnc-rspns-pln/index-eng.aspx (Accessed March 2016).

Canada, *Federal Policy for Emergency Management: Building a Safe and Resilient Canada* (Ottawa: Public Safety Canada, 2012). Available at: www.publicsafety.gc.ca/cnt/rsrcs/pblctns/plc-mrgnc-mngmnt-eng.pdf (Accessed May 2016).

Center for Army Lessons Learned, "Establishing a Lessons Learned Program: Observations, Insights and Lessons," In Center for Army Lessons Learned Handbook 11-33, June 2011. http://usacac.army.mil/sites/default/files/publications/11-33.pdf (Last accessed September 30, 2015).

Checkland, P., *Soft Systems Methodology in Action* (Chichester, England: John Wiley and Sons Ltd., 1999).

Coccia, M., "A new taxonomy of country performance and risk based on economic and technological indicators," *Journal of Applied Economics*, 10(1) (2007): 29–42.

Cohen, M.J., "Economic dimensions of Environmental and Technological Risk Events: Toward a Tenable Taxonomy," *Organization & Environment*, 9(4) (1996): 448–481.

Jones, C., "Evaluating Program and Project Performance – Some Lessons from the Canadian R&D Sector." http://www.clembowman.info/PDFs/evaluating_perf.pdf (Accessed July 2016).

Kaliner, J., "When Will We Ever Learn? The After Action Review, Lessons Learned and the Next Steps," in Training and Education of the Homeland Security Enterprise of the 21st Century. Naval Post Graduate School Thesis, June 2013.

Lambe, P., *Organising Knowledge: Taxonomies, Knowledge and Organisational Effectiveness* (Oxford: Chandos Publishing, 2007).

Legere, J., *CIFER Environmental Scan/Literature Review*, Defence Research and Development Canada, DRDC-RDDC Contract Report DRDC-RDDC-2015-C244, October 2015.

Legere, J., *Continuous Improvement of Federal Event Response (CIFER) Taxonomy*, Defence Research and Development Canada, DRDC Contract Report, DRDC-RDDC-2016-C039, February 2016.

McIntyre, S., Dalkir, K., Paul, P., and Kitimbo, I., *Utilizing Evidence-Based Lessons Learned for Enhanced Organization Innovation and Change* (Hersey PA: IGI Global, 2015).

McIntyre, S. and Kaminska, K., *Capturing Lessons That Should be Learned: An After Event Review for Whole-of-Government Security Planning and Operations*, Defence R&D Canada – Centre for Security Science, Ottawa, September 2011, DRDC-CSS-SL-2011-11.

NATO JALLC (2011). The NATO Lessons Learned Handbook. 2nd Edition, September 2011. http://www.jallc.nato.int/products/docs/Lessons_Learned_Handbook_2nd_edition.pdf (Last accessed September 30, 2015).

Public Safety Canada, *Internal Audit of Emergency Management Planning: Leadership and Oversight.* January 2014. http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ntrnldt-mrgncy-mngmnt-plnnng/index-en.aspx (Accessed March 2016).

Santos, J., Reynaldo, A., Mitchell, D., and Pope, P., "Are open-ended questions tying you in knots?" *Journal of Extension*, 37 (1999), http://www.joe.org/joe/1999august/iw2.php (Accessed March 2016).

Verga, S., "All-hazards risk framework – an architecture model." DRDC Centre for Security Science, 2010 (DRDC CSS, Ottawa, Canada).

Annex A CIFER WG Terms of Reference

Continuous Improvement of Federal Event Response (CIFER) Working Group

TERMS OF REFERENCE
July 2015

1.0 Authority:

The CIFER WG is established under the authority of the Directors General Event Response Committee (DG ERC) within the governance system of the Federal Emergency Response Plan (FERP).

2.0 Membership

2.1 Secretariat

The CIFER Secretariat will reside at the Government Operation Centre (GOC).

2.2 Co-Chairs

The CIFER WG will be co-chaired by the GOC Support Division and one member of the CIFER WG.

2.3 Membership

The CIFER WG membership includes representatives designated by organizations within DG ERC as well as subject matter experts from Defence Research and Development Canada's Centre for Security Science. Members are identified as having expertise or responsibilities within their own department for after-action reporting, lessons learned, or continuous improvement. See ANNEX A for current list of CIFER WG members.

3.0 Mandate

The purpose of the CIFER WG is to develop and operate the CIFER program on behalf of DG ERC. The purpose of the CIFER program is to harness the collective strength of the federal response community to drive continuous improvement and ensure that lessons learned and best practices are used to systematically and effectively improve future operations.

The CIFER WG will:

- provide leadership in the creation of a community-based approach to continuous improvement for federal event response;
- work collaboratively to build and maintain the tools and methodology to effectively track, prioritize, share, and report on lessons learned and best practices; and
- support the FERP governance structure, and related communities, in their efforts address lessons learned.

4.0 Duration

The CIFER WG will serve until its function as long as a CIFER program is in operation, or until DG ERC determines that the WG is no longer required.

5.0 Roles and Responsibilities

5.1 DG ERC

The purpose of the DG ERC is to create a federal committee of directors general who manage operational response efforts and who direct, support and improve response planning and coordination for events affecting the national interest.

5.2 CIFER Secretariat (GOC)

- schedule meetings, circulate and collect comments on group documents, draft records of decision, as required;
- provide documents in advance of meetings when possible; and
- coordinate the interactions with DG ERC.

5.3 Co-Chairs

- coordinate CIFER WG meetings; draft material in support of program deliverables;
- relay any specific direction received from DG ERC;
- provide the WG's recommendations to DG ERC for endorsement; and
- liaise with co-chairs of other working groups under DG ERC.

5.4 CIFER WG members

- attend CIFER WG meetings, assist in drafting materials in support of program deliverables;
- coordinate collection, submission and tracking of recommendations in CIFER program; and
- act as point of engagement between own organization and CIFER program.

6.0 Linkages to other committees under DG ERC

The CIFER WG will liaise closely with the Federal Exercise Working Group as well as with other working groups under DG ERC (see Figure A.1 below). The CIFER Secretariat will strive to ensure that meetings of these groups do not conflict, and that relevant information is shared between the chairs/co-chairs of each working group to better coordinate the efforts of each group.

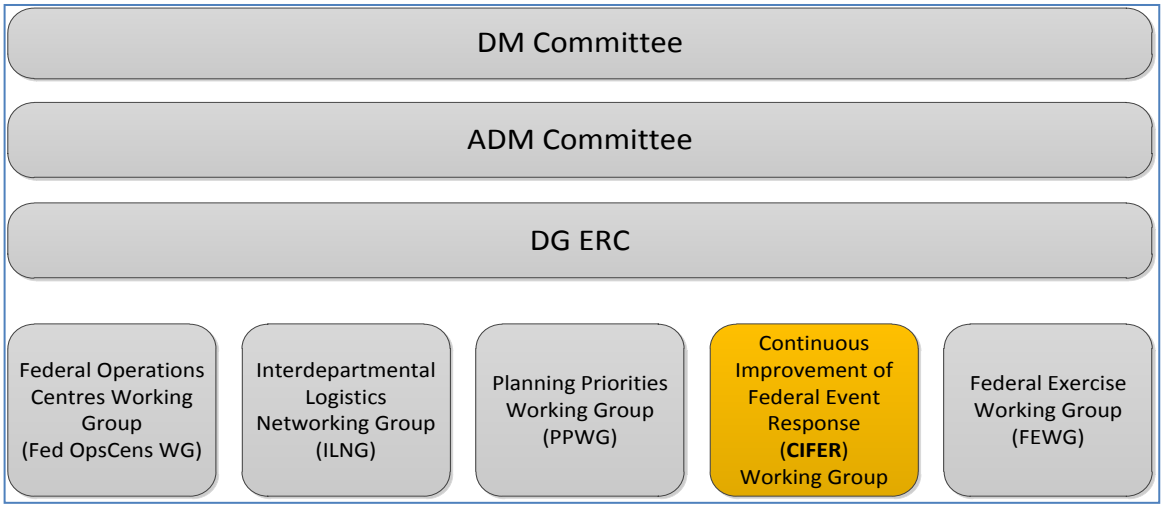

Figure A.1: *CIFER Terms of Reference and Working Groups under DG ERC.*

This page intentionally left blank.

Annex B List of CIFER Project Key Documents and Artifacts

Annex B provides a list of CIFER project documents and key artifacts that were accessed, reviewed and consulted over the course of the project.

DOCUMENT LIST			
DATE	**TITLE/PUBLICATION**	**OPI**	**SYNOPSIS**
2007 (current to 21 July 2015)	***Emergency Management Act*, S.C. 2007, c. 15**	Government of Canada	The *Emergency Management Act* is the legislation that make the Public Safety Minister for exercising leadership relating to emergency management in Canada by coordinating, among government institutions and in cooperation with the provinces and other entities, emergency management.
Dec 2009	***Federal Policy for Emergency Management: Building a Safe and Resilient Canada***	Public Safety Canada	A policy to promote an integrated and resilient whole-of-government approach to emergency management planning, which includes better prevention/mitigation of, preparedness for, response to, and recovery from emergencies.
Jan 2011	***Federal Emergency Response Plan***	Government of Canada (pursuant to *Policy on Government Security)*	The FERP is designed to harmonize federal emergency response efforts with those of the provinces/territorial governments, non-governmental organizations, and the private sector. Recognizes the fact that the Minister of Public Safety has leadership and coordination responsibilities in the event of an emergency under the *EMA*.
Jan 2011	***An Emergency Management Framework for Canada Second Edition***: Ministers Responsible for Emergency Management	Public Safety Canada	An Emergency Management Framework for Canada guides and strengthens the way governments work together to protect the safety and security of all Canadians.
Jan 2014	"***Internal Audit of Emergency Management Planning: Leadership & Oversight***"–	Public Safety Canada	The audit objective was to provide reasonable assurance that the core management controls in place across EM&RO Branch are adequate and effective to:

DOCUMENT LIST			
DATE	**TITLE/PUBLICATION**	**OPI**	**SYNOPSIS**
	WindReach Consulting Services http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ntrnldt-mrgncy-mngmnt-plnnng/ntrnldt-mrgncy-mngmnt-plnnng-eng.pdf		• support robust management and decision-making, in compliance with policy and legislation; and • to fulfill the department's roles in relation to EM planning leadership and oversight of federal institutions, in accordance with the EMA.
May 2015	***CIFER Proposed Program Plan***	Public Safety Canada	Background and proposal to DG ERC.
May 2015	PowerPoint Presentation to DG ERC – ***CIFER Proposed Program***	Public Safety Canada	Overview of the CIFER Program.
24 Jun 2015	***CIFER Kickoff – Overview of CIFER Program to participants***	Public Safety Canada	PowerPoint Presentation – Overall project deliverable is a ConOps by end 2015/2016.
24 Jun 2015	***Record of Decisions*** CIFER Working Group	Public Safety Canada	Overview of initial CIFER WG meeting.
July 2015	***Terms of Reference*** – CIFER WG	Public Safety Canada	The terms of reference for the CIFER WG.

DOCUMENT LIST			
DATE	**TITLE/PUBLICATION**	**OPI**	**SYNOPSIS**
Undated	***CIFER- Quarterly Report on Progress (DRAFT)***	Public Safety Canada	This is the draft template to update the DG ERC and senior leadership on CIFER progress.
14 Aug 2015	***CIFER Workshop #1 – Handbook***	Public Safety Canada	Guidance and background information for Workshop #1 attendees.
14 Aug 2015	***CIFER Workshop #1 – Methodology*** – PowerPoint Presentation	Public Safety Canada	An overview of Workshop #1 – Methodology.
19 Aug 2015	***CIFER Workshop #1 – Summary***	Public Safety Canada	Record of outcomes of the Workshop #1 Summary.
20 Oct 2015	***CIFER Environmental Scan/Literature Review***	DRDC CSS	A comprehensive review of CIFER Program authoritative and foundational documents and manuals, key reports, articles and websites for leading military and emergency management organizations with established lessons learned programs.

DOCUMENT LIST			
DATE	**TITLE/PUBLICATION**	**OPI**	**SYNOPSIS**
28 Oct 2015	***CIFER Update – PowerPOint Presentation to Workshop #2***	Public Safety Canada	An overview of the plan for the CIFER Methodology; specifically, the scope (how departments make recommendations); prioritization (how those recommendations are "triaged"; and the proposed accountability framework for the CIFER program. This presentation was used to facilitate discussions during Workshop #2, held on 24 November 2015.
24 Nov 2015	***Literature Review/Environmental Scan Presentation***	DRDC CSS	A presentation to the CIFER WG outlining the results of the Literature Review/Environmental Scan and the results of the Questionnaires sent to the CIFER WG and the DG ERC, presented by the DRDC / CSS CIFER Project team.
05 Feb 2016	***CIFER Taxonomy***	DRDC CSS	This document provides a recommended taxonomy for the CIFER Programs, sample risk-informed rating methodologies for rating recommendations, and a glossary of terms and definitions.

Annex C CIFER WG Questionnaire

Working Group Questionnaire

1. **What level of your organization (working, management, senior management, ADM, DM, etc.) is accountable for:**

   a. Collecting of lessons learned observations?
   b. Implementing recommendations resulting from these observations?

2. **How does your organization set priorities when it comes to implementing recommendations resulting from your continuous improvement process? For example, given multiple priorities, how do you decide what recommendations to act on and in what order?**

3. **Preliminary research indicates that many lessons learned programs are extremely useful at identifying issues, but do not necessarily result in actual changes that solve these issues. In the case of your organization, how do you ensure that "lessons identified" turn into "lessons learned"?**

4. **In your opinion, how effective (from 1 to 5 where 5 is the highest) is your organization's current lessons learned / continuous improvement system?**

   ○ 1 ○ 2 ○ 3 ○ 4 ○ 5

   Effectiveness is defined as:

   1 = non-existent, or dormant
   2 = functioning but with no formal methodology, performed on an as available basis, some degree of success in identifying lessons
   3 = basic methodology in place, lessons are identified, some challenges are faced in tracking and implementing improvements.
   4 = developed methodology, recommendations are tracked, some challenges faced in the implementation of complex issues.
   5 = mature methodology for identifying lessons tracking progress, and implementing solutions.

5. **Describe any aspects of your organization's current lessons learned system that you would identify as best practices?**

6. **Describe any significant challenges to your organization's current lessons learned system?**

   a. When reviewing a response to an event or an exercise that was conducted by multiple organizations, what additional factors are considered compared with one conducted solely by your own organization?

7. **Should recommendations be identified that are outside your organization's mandate, how should responsibility to implement be assigned?**

8. **How does your organization deal with recommendations that span multiple ministerial mandates?**

9. **How does your organization handle recommendations that necessitate the involvement of other levels of government (i.e. Municipal or Provincial)?**

10. **Currently work is being conducted to develop a method for federal response organizations to work collectively on the prioritization and implementation of recommendations for improvement. How would you rank the following in regards to importance of prioritization of these recommendations?**

    Please rank **all** that you believe apply:

    ☐ Governance
    ☐ Human Resources
    ☐ Financial Resources
    ☐ Training
    ☐ Competing Priorities
    ☐ Management/Senior Management Buy-in
    ☐ Security
    ☐ Technology
    ☐ Government Priorities (i.e., Speech from the Throne, etc.)
    ☐ Policy / Regulatory / Legislative
    ☐ Other(Specify):_____

11. In your opinion, how effective (from 1 to 5 where 5 is the highest) would you rate the current manner with which federal response organizations collectively deal with lessons learned / continuous improvement?

Please choose **only one** of the following:

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Effectiveness is defined as:
1 = non-existent, or dormant
2 = functioning but with no formal methodology, performed on an as available basis, some degree of success in identifying lessons
3 = basic methodology in place, lessons are identified, some challenges are faced in tracking and implementing improvements
4 = developed methodology, recommendations are tracked, some challenges faced in the implementation of complex issues
5 = mature methodology for identifying lessons tracking progress, and implementing solutions

12. In your opinion, who has the mandate to coordinate Government of Canada lessons learned and continuous improvement action plans?

a. Who has the authority to ensure implementation of lessons learned?

13. If you could design an ideal system, what factors do you think would be most important in setting priorities for the implementation of lessons learned recommendations?

Please number each box in order of precedence from 1 to 6

Risk of not implementing	
Ease of implementation	
Management buy-in	
Cost	
Reach (How many stakeholders impacted)	
Government Priorities	

14. Are there any other issues related to improving federal event response you believe need to be addressed? Please respond below.

Thank you for taking the time to complete this questionnaire. The data received from the questionnaires will be used to inform the development of effective continuous improvement system. Please email your completed survey to: Chad.Scarborough@opscen.gc.ca

Figure C.1: *CIFER WG Questionnaire.*

Annex D DG ERC Questionnaire

DG ERC Questionnaire

1. **In your opinion, who has the mandate to coordinate Government of Canada lessons learned and continuous improvement action plans?**
   GOC

   a. **Who has the authority to ensure implementation of lessons learned?**

2. **If you could design an ideal system, what factors do you think would be most important in setting priorities for the implementation of lessons learned recommendations?**

   Please number each box in order of precedence from 1 to 6

Risk of not implementing	
Ease of implementation	
Management buy-in	
Cost	
Reach (How many stakeholders impacted)	
Government Priorities	

3. **Are there any other issues related to improving federal event response you believe need to be addressed? Please respond below.**

Thank you for taking the time to complete this questionnaire. The data received from the questionnaires will be used to inform the development of an effective continuous improvement system. Please email your completed survey to: Chad.Scarborough@canada.ca

Figure D.1: *DG ERC Questionnaire.*

This page intentionally left blank.

Annex E Process Checklist to Assess Recommendations for CIFER Inclusion

PART A			
Does the recommendation affect any of the following areas:			
☐ Interdepartmental event response	☐ Is a multi-departmental issue/concern		
	☐ Is a multi-jurisdictional issue/concern		
☐ Effective functioning of government	☐ There is a significant impact on the national/ international confidence of the federal government if left unresolved		
	☐ Is it a core department/s business continuity issue/concern		
☐ Legislative requirements	☐ Implicates the whole-of-government emergency management framework		
	☐ Falls within the mandate/authority of the FERP governance (including ESFs)		
	☐ Falls under one of the four pillars of emergency management (mitigation, preparedness, response, recovery)		
Can/has the recommendation been addressed through other government channels?		☐ **YES**	☐ **NO**
If YES, describe what mechanism:			
Does the recommendation require <u>interdepartmental</u> senior management direction, attention or authority?		☐ **YES**	☐ **NO**
If YES, please indicate if it is related to:			
☐ Resource allocations (under/over)	☐ Recurrent, unresolved issue(s)	☐ New or emerging threat(s)	
☐ Other/Comments:			
Can the recommendation be accomplished under your departments current mandate, authority, capacity and/or funding allocations?		☐ **YES**	☐ **NO**

Figure E.1: *Proposed Process Checklist.*

PART B		
Is this information to be shared with other departments as a best practice that could increase departmental efficiencies?	☐ **YES**	☐ **NO**
If YES, please describe the best practice as accurately as possible:		
Does the information need to be entered into the CIFER database for future tracking purposes?	☐ **YES**	☐ **NO**
PART C		
Is there additional information not gathered in this form that supports the recommendations' inclusion within CIFER?		

Source:	**Reporting Date:**	**Reporting Department:**
RECOMMENDATION:		

Figure E.2: *Proposed Process Checklist (continued).*

Annex F Proposed Template for the Submission of Recommendations

Security classification: _____

Recommendation	
WHAT is the change or action that is required? _____ _____ _____ WHO should lead the change or action? _____ (organization/POC) WHEN should this change or action be done? _____	
Recommended Priority: Low ☐ Med ☐ High ☐	Best Practice ☐ Lesson identified ☐ Gap identified ☐
Topic of Recommendation: [dropdown menu] *(Planning, Governance, Telecommunications, Facilities/Equipment, or Training)*	Level of impact: [dropdown menu] *(Departmental / ESF(s) / Strategic & Whole-of-Government)*
Key tag words:	
Source Report	
Reporting Organization:	
Source report name:	Report location:
Date approved:	Approved by: *(Name, Position, organization)*

Figure F.1: *Proposed Template for the Submission of Recommendations for the CIFER Program.*

Description of Event	
Event Name:	FERP Response Level 1 ☐ 2 ☑ 3 ☐
Category of event: [dropdown menu]	Exercise ☑ Planned event ☐ Emergency ☐
Primary Department(s):	Supporting Department (s):
Short background of event:	
Rationale for Recommendation	
Context of event and a short summary of the observed deficiency requiring improvement and why:	
Options analysis performed:	

Figure F.2: *Proposed Template for the Submission of Recommendations for the CIFER Program (continued).*

Annex G Quarterly Assessment Template

Progress Report

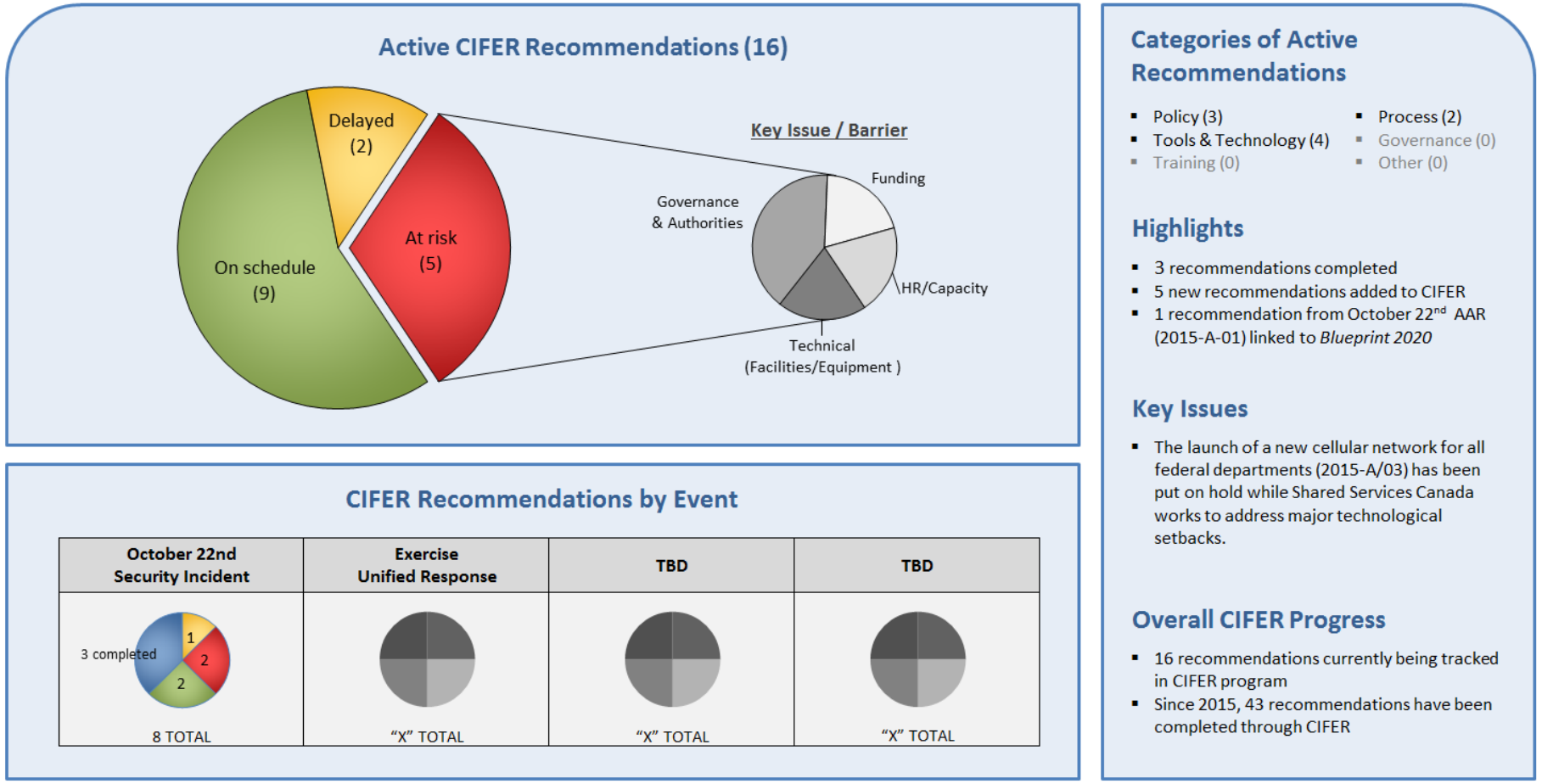

Figure G.1: *Proposed Quarterly Progress Reporting and Assessment Templates.*

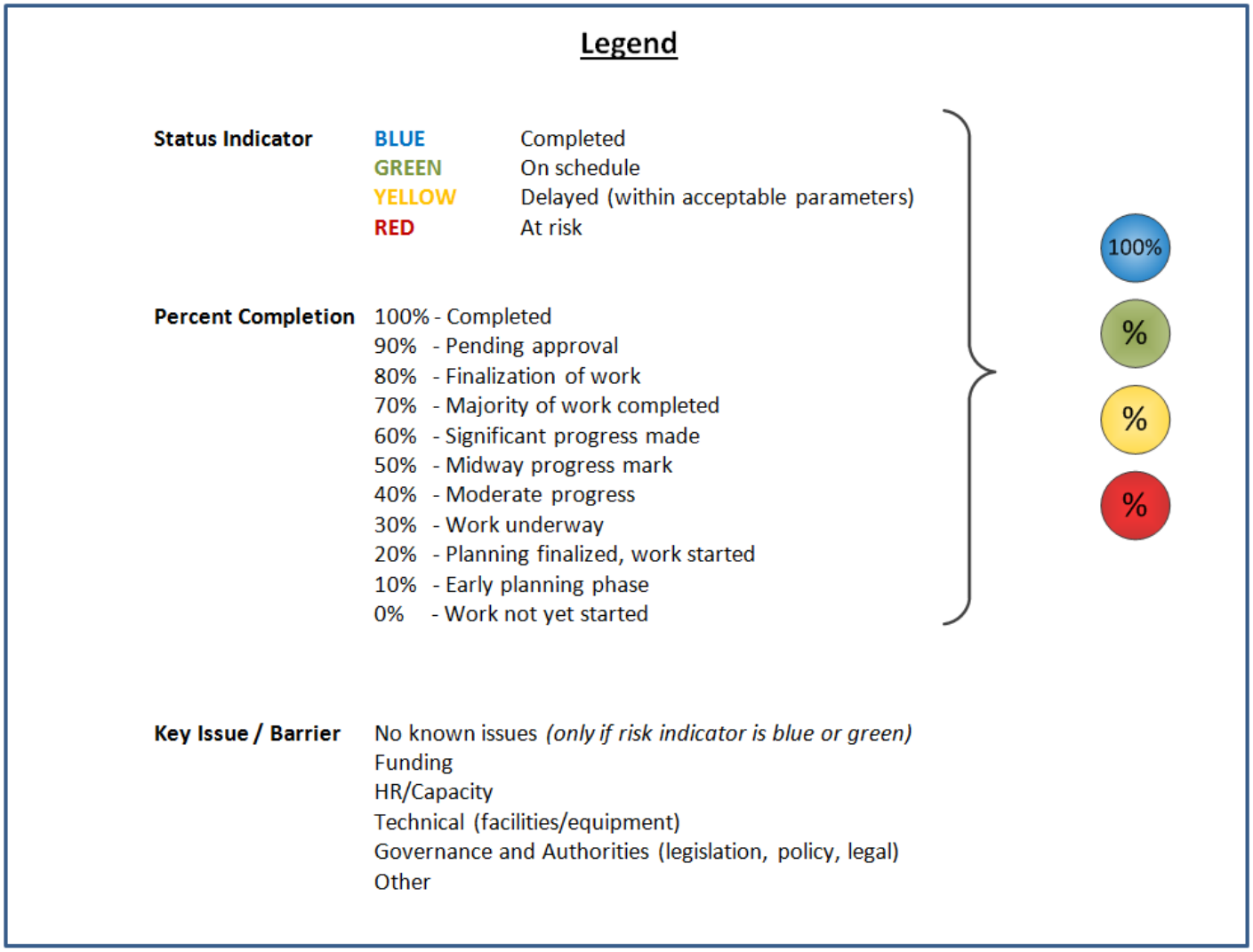

Figure G.2: *Proposed Quarterly Progress Reporting and Assessment Templates.*

Table G.1: *Proposed Quarterly Progress Reporting and Assessment Templates.*

CIFER ID *new	Source Event	Recommendation	OPI	Indicator	Key Issue / Barrier	Comments on Progress	Annex Page #
Category: POLICY							
2015-A/R01	Oct 22nd Security Event	**Recommendation title**	XXX	20%	**HR/Capacity**	Plan has been drafted, but is waiting on input from Department of Justice before proceeding. Completion will be delayed because of a lack of human resources to implement the solution.	1
2015-B/R01	EX Unified Response	**Recommendation title**	XXX	80%	**Funding**	Text	3
Category: PROCESS							
2015-A/R02		**Recommendation title**	XXX	90%	**Technical (Facilities/Equipment)**	Text	4
Category: TOOLS/TECHNOLOGY							
2015-C/R01		**Recommendation title**	XXX	50%	**No known issues (only if risk indicator is GREEN)**	Text	5
2015-A/R03		**Recommendation title**	XXX	90%	**No known issues (only if risk indicator is GREEN)**	Text	2
Category: TRAINING							
2015-A/R04		**Recommendation title**	XXX	100%	**No known issues (only if risk indicator is GREEN)**	Text	6

Table G.2: *Proposed Quarterly Progress Reporting and Assessment Templates.*

Status Table of Recommendations

October 22nd Security Incident (CIFER 2015-A)		
2015-A/R01	**Recommendation:** Click here to enter text.	**Category:** Choose an item.
	Source of Recommendation (report/approvals): Click here to enter text.	
ACTION PLAN	Responsible Organization: Click here to enter text. Status contact person: Click here to enter text. Responsible DG ERC Member: Click here to enter text. phone/email: Click here to enter text.	
	Objectives: Click here to enter text. Implementation strategy: Click here to enter text. Expected completion date (Month, Year): Click here to enter text. Resources (persons) assigned for project/implementation duration: Choose an item. Other information on level of effort/costs: Click here to enter text. Related government programs, priorities, initiatives: Click here to enter text.	
CURRENT STATUS	90%	Primary issue or barrier to completion (select best fit): Choose an item. [If "Other", please identify: Click here to enter text.]
		Secondary issue or barrier to completion (select best fit): Choose an item. [If "Other", please identify: Click here to enter text.]
	Progress update: Click here to enter text. Key milestones achieved: Click here to enter text. **Description of keys issues/barriers:** Click here to enter text.	
LAST REPORTED STATUS	70%	Key issue or barrier to completion (select best fit): Choose an item. [If "Other", please identify: Click here to enter text.] **Description of keys issues/barriers:** Click here to enter text.

Annex H Proposed Outline – CIFER's Concept of Operations

1. Introduction
2. Purpose of the CIFER Program
3. Authorities for the CIFER Program
   - 3.1 DM Committee
   - 3.2 ADM Committee
   - 3.3 DG ERC
4. CIFER Program Roles and Responsibilities
   - 4.1 Public Safety Canada
   - 4.2 DG ERC
   - 4.3 CIFER Secretariat
   - 4.4 CIFER WG
   - 4.5 Federal Departments and Agencies
5. The CIFER Process and Methodology
6. Reporting Observations, Insights and Lessons
7. Training and Education
8. Federal Event Response Lessons Learned Database

Glossary

List of Abbreviations

List of Figures

Annex A – After Action Report Template

Annex B – Recommendation Submission Form

Annex C – Recommendation Implementation Tracking Form

Annex D – CIFER Program Quarterly Report to DG ERC

This page intentionally left blank.

List of Symbols/Abbreviations/Acronyms/Initialisms

AAR	After Action Review/Report
ABCA	American, British and Canadian Armies
ADM	Associate/Assistant Deputy Minister
AHRA	All Hazards Risk Assessment
AIR	After Incident Review/Report
CAIP	Capability Improvement Process
CDC	Centres for Disease Control (US)
CIFER	Continuous Improvement Federal Event Response
ConOps	Concept of Operations
COP	Common Operating Picture
DM	Deputy Minister
DND	Department of National Defence
DoE	Department of Energy (US)
DRDC	Defence Research and Development Canada
DRDC CSS	Defence Research and Development Canada Centre for Security Science
ESF	Emergency Support Function
FEMA	Federal Emergency Management Agency (US)
FERP	Federal Emergency Response Plan
FEWG	Federal Emergency Response Working Group
IM/IT	Information Management/Information Technology
JALLC	Joint Analysis and Lessons Learned Centre (NATO)
OGD	Other Government Departments
OPI	Office of Primary Interest
RCAF	Royal Canadian Air Force
SOW	Statement of Work
TA	Technical Authority
WG	Working Group

This page intentionally left blank.

DOCUMENT CONTROL DATA

(Security markings for the title, abstract and indexing annotation must be entered when the document is Classified or Designated)

1. ORIGINATOR (The name and address of the organization preparing the document. Organizations for whom the document was prepared, e.g., Centre sponsoring a contractor's report, or tasking agency, are entered in Section 8.)

DRDC – Centre for Security Science
Defence Research and Development Canada
222 Nepean St., 11th Floor
Ottawa, Ontario K1A 0K2
Canada

2a. SECURITY MARKING (Overall security marking of the document including special supplemental markings if applicable.)

UNCLASSIFIED

2b. CONTROLLED GOODS

(NON-CONTROLLED GOODS)
DMC A
REVIEW: GCEC DECEMBER 2013

3. TITLE (The complete document title as indicated on the title page. Its classification should be indicated by the appropriate abbreviation (S, C or U) in parentheses after the title.)

Continuous Improvement for Federal Event Response (CIFER) : Decision support for the development of the program's Concept of Operations (ConOps)

4. AUTHORS (last name, followed by initials – ranks, titles, etc., not to be used)

Friesen, S.; Logue, T.; Vivekanandarajah, V.; Legere, J.; Kelsey, S.

5. DATE OF PUBLICATION (Month and year of publication of document.)	6a. NO. OF PAGES (Total containing information, including Annexes, Appendices, etc.)	6b. NO. OF REFS (Total cited in document.)
August 2016	96	21

7. DESCRIPTIVE NOTES (The category of the document, e.g., technical report, technical note or memorandum. If appropriate, enter the type of report, e.g., interim, progress, summary, annual or final. Give the inclusive dates when a specific reporting period is covered.)

Scientific Report

8. SPONSORING ACTIVITY (The name of the department project office or laboratory sponsoring the research and development – include address.)

DRDC – Centre for Security Science
Defence Research and Development Canada
222 Nepean St., 11th Floor
Ottawa, Ontario K1A 0K2
Canada

9a. PROJECT OR GRANT NO. (If appropriate, the applicable research and development project or grant number under which the document was written. Please specify whether project or grant.)	9b. CONTRACT NO. (If appropriate, the applicable number under which the document was written.)
Contract Project Number: CSSP-2015-TI-2131	

10a. ORIGINATOR'S DOCUMENT NUMBER (The official document number by which the document is identified by the originating activity. This number must be unique to this document.)	10b. OTHER DOCUMENT NO(s). (Any other numbers which may be assigned this document either by the originator or by the sponsor.)
DRDC-RDDC-2016-R160	CSSP-2015-TI-2131

11. DOCUMENT AVAILABILITY (Any limitations on further dissemination of the document, other than those imposed by security classification.)

Unlimited

12. DOCUMENT ANNOUNCEMENT (Any limitation to the bibliographic announcement of this document. This will normally correspond to the Document Availability (11). However, where further distribution (beyond the audience specified in (11) is possible, a wider announcement audience may be selected.))

Unlimited

13. ABSTRACT (A brief and factual summary of the document. It may also appear elsewhere in the body of the document itself. It is highly desirable that the abstract of classified documents be unclassified. Each paragraph of the abstract shall begin with an indication of the security classification of the information in the paragraph (unless the document itself is unclassified) represented as (S), (C), (R), or (U). It is not necessary to include here abstracts in both official languages unless the text is bilingual.)

The Continuous Improvement of Federal Event Response (CIFER) project is a Public Safety (PS) Government Operations Centre (GOC)-led effort, with oversight by a permanent working group (WG) of key stakeholders comprised of representatives from across the federal community. This program was developed in part to meet mandated legislative requirements under the *Emergency Management Act* (2007). The aim of the program is to ensure that observations, insights and lessons captured in after action reports / after incident reports (AARs/AIRs) from exercises and real operations are used systematically to improve prevention, preparedness and response to future operations or events. For the past six months, Defence Research and Development Canada's Centre for Security Science (DRDC CSS) has provided technical advice and analytical support to the CIFER Secretariat in support of the development of a Concept of Operations (ConOps). Specifically, DRDC assisted in managing two CIFER WG Workshops, conducted an environmental scan, developed a taxonomy and provided advice on a risk-informed methodology for prioritizing, selecting and following through on recommendations. The project team also examined standardized templates for the submission of recommendations, tracking and reporting mechanisms for the Directors General Emergency Response Committee (DG ERC). The aim of this scientific report (SR) is to describe the advice, guidance and decision analytic support that DRDC CSS provided to PS, which is primarily meant to better support the development of the program's Concept of Operations.

Le Projet d'amélioration continue de l'intervention fédérale en cas d'incident (ACIFI) est un effort entrepris par le Centre des opérations du gouvernement (COG) de Sécurité publique (SP) Canada, sous la supervision d'un groupe de travail (GT) permanent d'intervenants clés composé de représentants de l'ensemble de la communauté fédérale. Le programme a été élaboré en partie pour répondre aux exigences législatives prescrites aux termes de la *Loi sur la gestion des urgences* (2007). Le programme a pour but de veiller à ce que les observations, idées et leçons tirées des rapports après action / rapports après incident (RAA/RAI) dans le cadre d'exercices et d'opérations réelles servent systématiquement à améliorer la prévention, la préparation et la réaction aux opérations et événements futurs. Ces six derniers mois, le Centre des sciences pour la sécurité de Recherche et développement pour la défense Canada (CSS RDDC) a fourni des conseils techniques et assuré un soutien analytique au Secrétariat de l'ACIFI à l'appui de l'élaboration d'un concept des opérations (CONOPS). Plus précisément, RDDC a aidé à gérer deux ateliers du GT sur l'ACIFI, effectué une analyse environnementale, établi une taxonomie et fourni des conseils sur une méthode fondée sur l'évaluation du risque pour classer les recommandations par ordre de priorité, les sélectionner et y donner suite. L'équipe du projet a également examiné les modèles normalisés pour la présentation des recommandations, le suivi et les mécanismes de communication pour le Comité des directeurs généraux sur les interventions en cas d'incident. Le présent rapport scientifique (SR) a pour but de définir les avis, l'orientation et le soutien à l'analyse décisionnelle que RDDC CSS a fourni à la sécurité publique, ce qui est surtout destiné à faciliter l'élaboration du programme Concept d'opération.

15. KEYWORDS, DESCRIPTORS or IDENTIFIERS (Technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus, e.g., Thesaurus of Engineering and Scientific Terms (TEST) and that thesaurus identified. If it is not possible to select indexing terms which are Unclassified, the classification of each should be indicated as with the title.)

Continuous improvement; lessons learned; After Action Review; recommendations; methodology; risk assessment; event response; public safety; security