Defence Research and Development Canada
Recherche et développement pour la défense Canada

DEFENCE R&D DÉFENSE

Overview of the All Hazards Risk Assessment (AHRA) Automated Application and Capability Assessment Management System (CAMS)

Shaye K. Friesen
DRDC CSS

George Giroux
Modis

Arnold Villeneuve
Contract Community Inc.

Defence R&D Canada – CSS

Technical Note
DRDC CSS TN 2013-031
November 2013

Canada

Overview of the All Hazards Risk Assessment (AHRA) Automated Application and Capability Assessment Management System (CAMS)

Shaye K. Friesen
DRDC CSS

George Giroux
Modis

Arnold Villeneuve
Contract Community Inc.

Defence R&D Canada – CSS

Technical Note
DRDC CSS TN 2013-031
November 2013

▪ **IMPORTANT INFORMATIVE STATEMENTS**

Template in use: template-may2011-eng.dot

Abstract

The aim of this Technical Note is to provide an overview of the automated All Hazards Risk Assessment (AHRA) application and Capability Assessment Management System (CAMS).

Resumé

Le but de cette note technique est de fournir un aperçu du system de gestion de l'Evaluation Tous Risques (SG-ETR) et du système de gestion de l'Evaluation des capacités (SG-EC).

Table of contents

List of figures

List of tables

1 Introduction

On October 31st 2013, the Risk & Capability Integration (RACI) Section hosted a technology demonstration (TD) at DRDC CSS. The purpose of the TD was to enable risk and capability assessment discussions by showcasing the tools and methods that have been developed as part of the DRDC CSS All-Hazards Risk Assessment (AHRA) Transition Targeted Investment (TI) project. Participants and observers included members from the Public Health Agency of Canada, Public Safety Canada, the Privy Council Office, the Royal Canadian Mounted Police, Heritage Canada as well as DRDC CSS Portfolio Managers. The aim of this Technical Note is to provide an overview of the automated All Hazards Risk Assessment (AHRA) application and Capability Assessment Management System (CAMS).

2 All Hazards Risk Assessment

The federal All Hazards Risk Assessment (AHRA) tool prototype was created to help users define and score potential hazards or threats across different categories of impacts, and determine the likelihood of the event occurring within a five year timeframe. The tool is built as a user-friendly Excel program with step-by-step prompts.

The AHRA tool considers impacts to the following categories: People, Economy, Environment, Territorial Security, Canada's Reputation & Influence, Society & Psycho-Social and Critical Infrastructure, as described in the AHRA Methodology Guidelines.[1] Each Impact Category includes the option(s) to define your Confidence Level for the inputs as well as any justification you may wish to include. For ease of navigation between pages, links are provided at the bottom of each page.

The original version of the AHRA Scenario Scoring Tool was provided as a standalone Microsoft Excel spreadsheet. The Excel spreadsheet had to be emailed from individual to individual team member working on the scenario analysis. The objective of this phase of the AHRA development was to automate the processes involved and move the solution to an online environment and make it accessible across the organization's Intranet, and possibly even over the Internet. Doing so would facilitate access to the AHRA solution by team members throughout the organization and across many different organizations at many levels of government.[2]

This version of the AHRA is a fully automated and online capable solution using Microsoft SharePoint as the enabling platform. This version is a significant progression of the original version produced in 2010 in that it incorporates more than just the single AHRA Scenario Scoring Tool in that it takes into account the more encompassing aspect of the various sub-processes included in the entire scenario evaluation process.

2.1 Features

The key features of this version are (see Figures 1 to 7):

- Online accessibility both over Intranet and Internet and Extranet capable (see Figure 1);
- Use of InfoPath and SharePoint forms for capture data in an easy to use and user friendly format;

[1] See Canada, Public Safety Canada, *All Hazards Risk Assessment Methodology Guidelines, 2012-13* (Ottawa: Public Safety Canada, 2012). Available at: http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ll-hzrds-ssssmnt/index-eng.aspx.

[2] For additional information on this project, consult the following references: Ian Bayne, Jim Duncan, Brad Mills, Shaye Friesen, Alain Goudreau, *The Federal All Hazards Risk Assessment Framework Body of Knowledge: Volume1: Establishing an Information Baseline and Way Forward*; DRDC CSS Technical Report (TR), TR 2013-014; Defence Research and Development Canada – CSS; September 2013; and Ian Bayne; Jim Duncan; Brad Mills; Shaye Friesen; Alain Goudreau, *The Federal All Hazards Risk Assessment Framework Body of Knowledge: Volume II: Supporting Material;* DRDC CSS Technical Note (TN) TN-2013-015; Defence Research and Development Canada – CSS, September 2013.

- Inclusion of other parts of the overall AHRA processes including:
    - Initial Threats and Hazards List to be approved by ADM
    - Risk Events Scenario Description Summary form
    - AHRA Scenario Scoring Tool based on original Excel spreadsheet (now an InfoPath Form)
    - AHRA Scenario Analysis Dashboard

- Scenario Content Management features like:
    - Version Control
    - Content Approval
    - Check In / Check Out (so only one person works on a Scenario at time)

- Team Member alert notification of new and updated scenarios via email and SMS text messages;

- Team Member collaboration facilities like Discussion Boards, Calendars, and Shared Tasks lists;

- Ability to assign Team Members responsibility for working on Scenarios;

- Workflow enabled for scenario approval and feedback of new and updated scenarios

- Scenario approval levels from ADMs and Supervisors at every level of the AHRA processes;

- Ability to use Social Networking features like content tagging and ratings;

- Ability to integrate within a larger web based environment;

- Ability to conduct Scenario Surveys of Team Members in order to gather additional information and consensus about a given scenario;

- Ability to create isolated scenario Workspaces in order to invite Team Members from different parts of the organization to work on a common scenario;

- Ability to access data from multiple scenarios for 3rd part analysis tools (like SSPS for example); and

- Ability to integrate with MASAS Geo Location solution previously developed by DRDC.

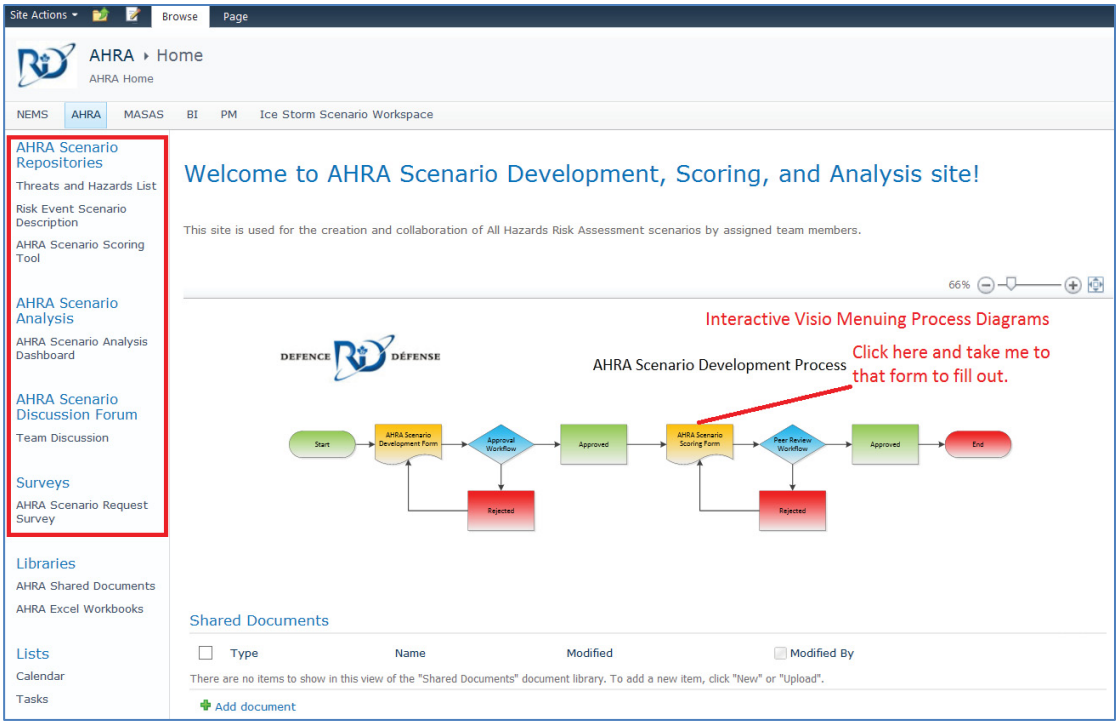


Figure 1: AHRA Landing Site

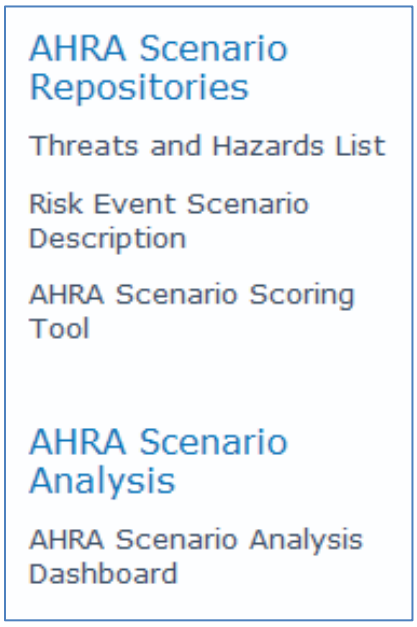


Figure 2: AHRA Main Processes

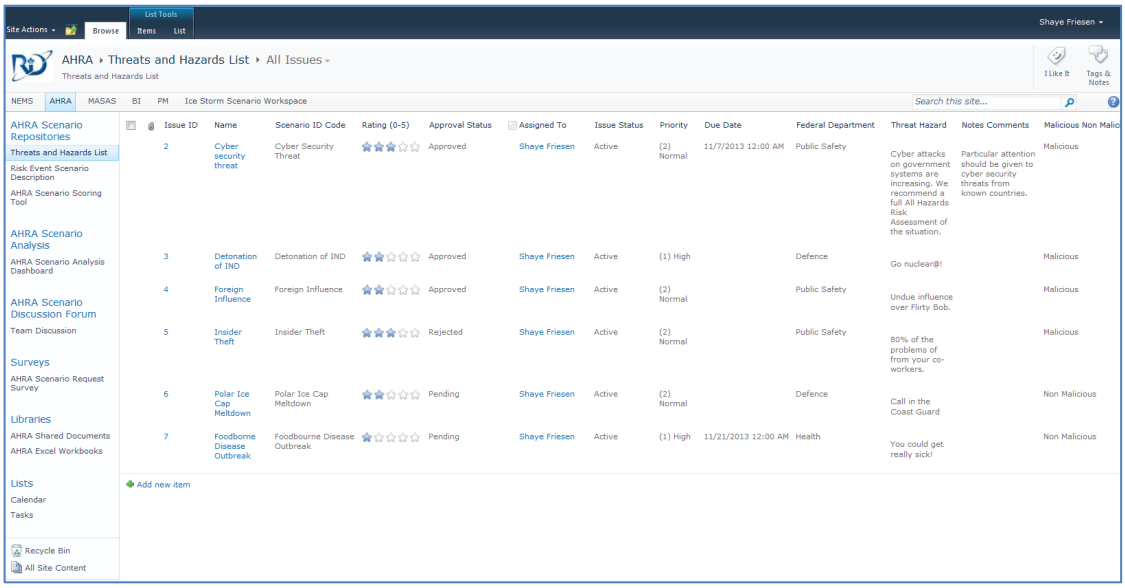


Figure 3: AHRA Threats and Hazards List

Figure 4: AHRA Scenario Event Description

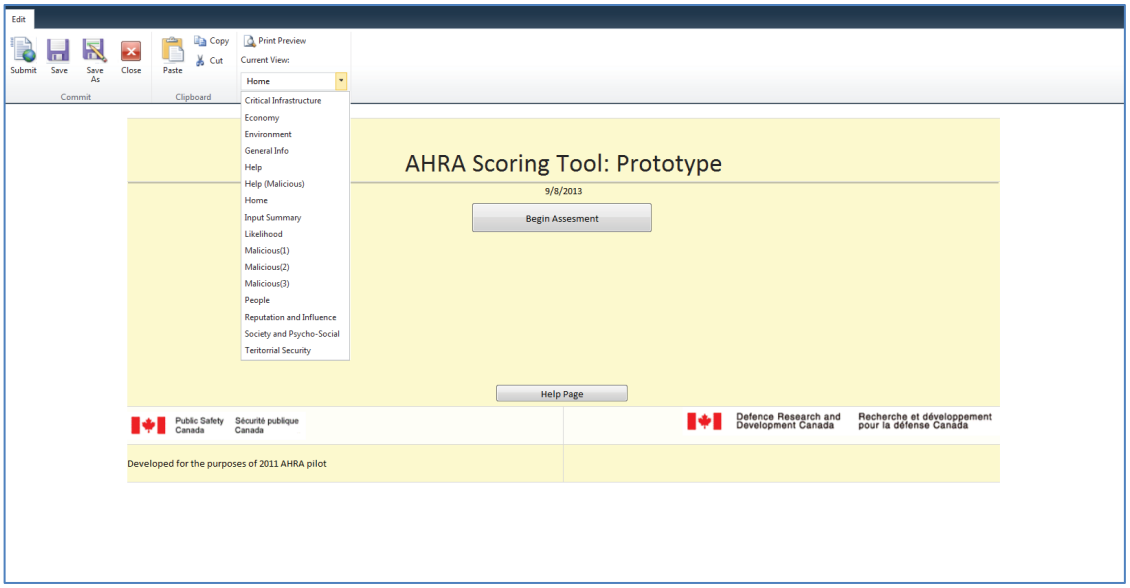
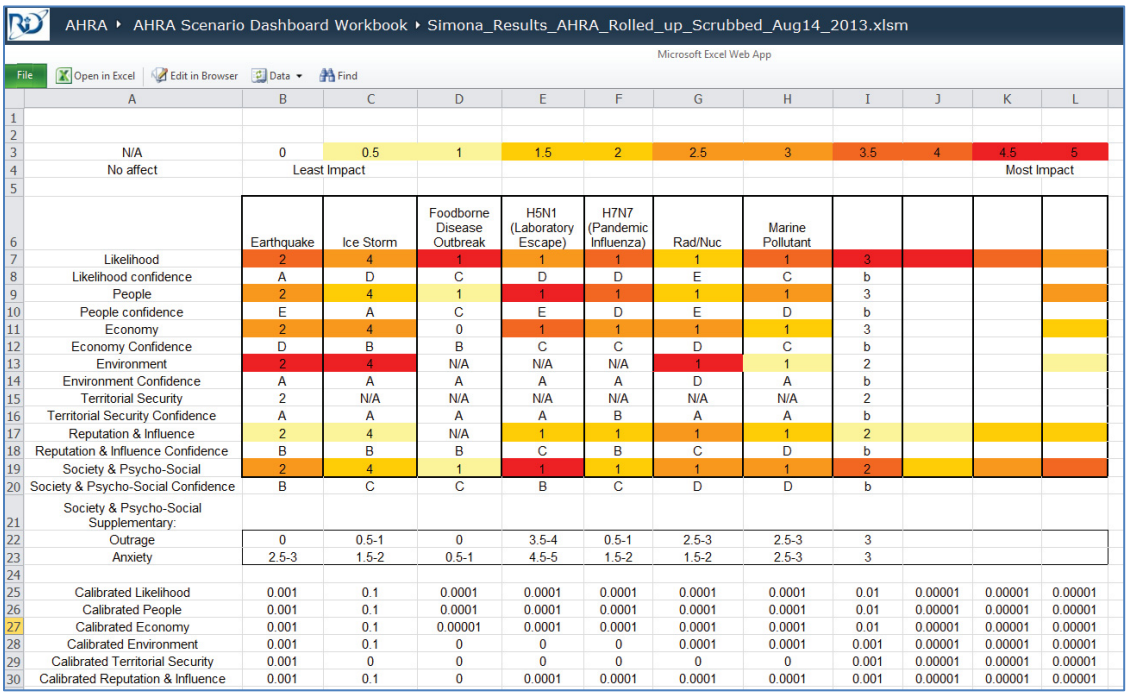


Figure 5: AHRA Scenario Scoring Tool



	A	B	C	D	E	F	G	H	I	J	K	L
3	N/A	0	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
4	No affect	Least Impact									Most Impact	
6		Earthquake	Ice Storm	Foodborne Disease Outbreak	H5N1 (Laboratory Escape)	H7N7 (Pandemic Influenza)	Rad/Nuc	Marine Pollutant				
7	Likelihood	2	4	1	1	1	1	1	3			
8	Likelihood confidence	A	D	C	D	D	E	C	b			
9	People	2	4	1	1	1	1	1	3			
10	People confidence	E	A	C	E	D	E	D	b			
11	Economy	2	4	0	1	1	1	1	3			
12	Economy Confidence	D	B	B	C	C	D	C	b			
13	Environment	2	4	N/A	N/A	N/A	1	1	2			
14	Environment Confidence	A	A	A	A	A	D	A	b			
15	Territorial Security	2	N/A	N/A	N/A	N/A	N/A	N/A	2			
16	Territorial Security Confidence	A	A	A	A	B	A	A	b			
17	Reputation & Influence	2	4	N/A	1	1	1	1	2			
18	Reputation & Influence Confidence	B	B	B	C	B	C	D	b			
19	Society & Psycho-Social	2	4	1	1	1	1	1	2			
20	Society & Psycho-Social Confidence	B	C	C	B	C	D	D	b			
21	Society & Psycho-Social Supplementary:											
22	Outrage	0	0.5-1	0	3.5-4	0.5-1	2.5-3	2.5-3	3			
23	Anxiety	2.5-3	1.5-2	0.5-1	4.5-5	1.5-2	1.5-2	2.5-3	3			
25	Calibrated Likelihood	0.001	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.01	0.00001	0.00001	0.00001
26	Calibrated People	0.001	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.01	0.00001	0.00001	0.00001
27	Calibrated Economy	0.001	0.1	0.00001	0.0001	0.0001	0.0001	0.0001	0.01	0.00001	0.00001	0.00001
28	Calibrated Environment	0.001	0.1	0	0	0	0.0001	0.0001	0.001	0.00001	0.00001	0.00001
29	Calibrated Territorial Security	0.001	0	0	0	0	0	0	0.001	0.00001	0.00001	0.00001
30	Calibrated Reputation & Influence	0.001	0.1	0	0.0001	0.0001	0.0001	0.0001	0.001	0.00001	0.00001	0.00001

Figure 6: AHRA Scenario Analysis Dashboard

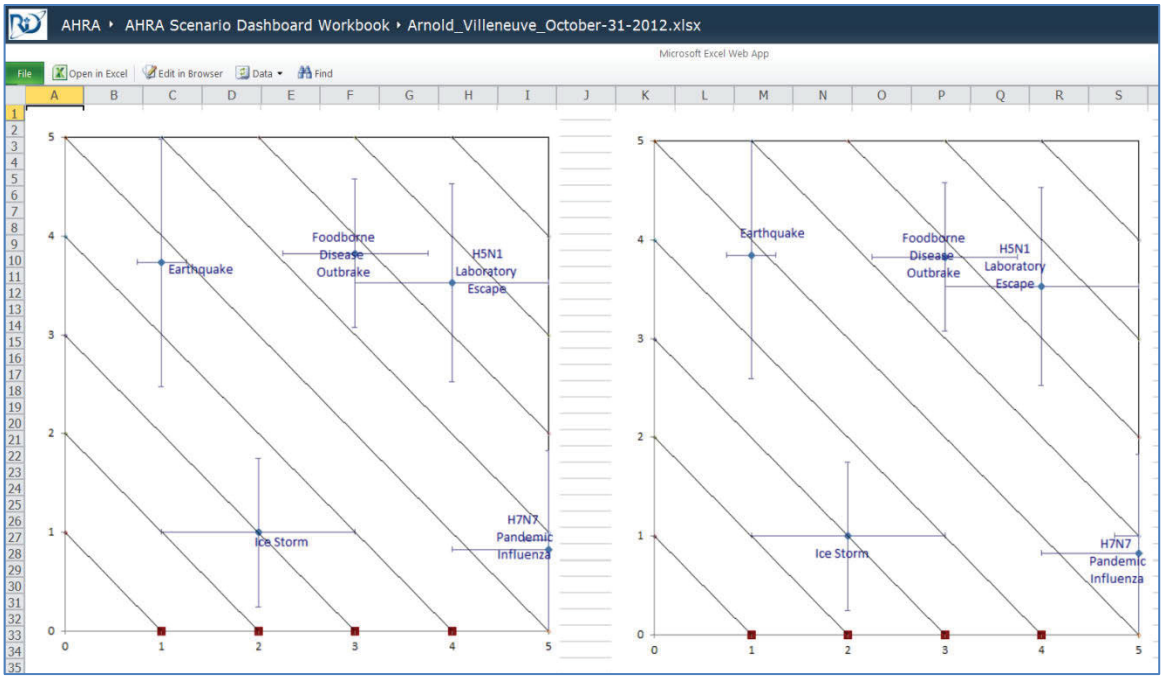


Figure 7: AHRA Scenario Analysis Graphs

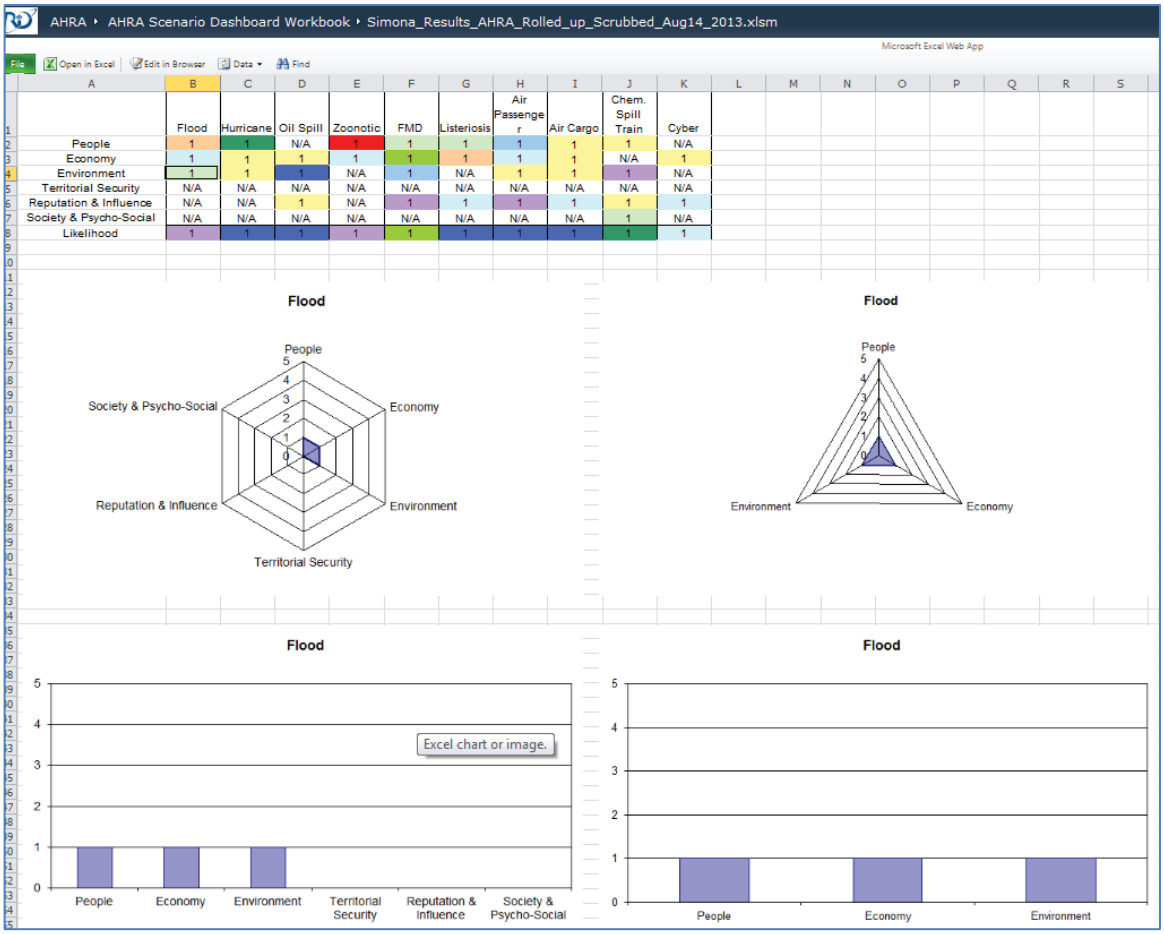


Figure 8: AHRA Roll Up Scenario Plots

3 Capability Assessment Management System

The Capability Assessment Management System (CAMS) is a simplification of the Full Scale Scenario Management System (FSSMS), which was developed in 2010 implementing the specifications found in the "PSTP Planning Scenario Framework Specification" as well as additional requirements determined during testing by the Public Health Agency of Canada (PHAC) and DRDC CSS.[3]

Following up on senior management direction, CSS developed a practical "how-to" guide for applying simple tools and techniques and conduct a structured capability assessment based on an illustrative scenario(s). This guide was published in May 2013, and complemented the AHRA approach, providing for a more detailed needs and gap analyses. The user's guide identified the following steps to undertake in conducting a capability assessment:

- Step 1 – Orientation;
- Step 2 - Scenario Development;
- Step 3 - Applying and Validating the Capability Framework;
- Step 4 - Identifying Capability Needs and Assessing Capabilities; and
- Step 5 - Documentation and Presentation.

Exercise Perseverance, a full-day Table-Top Exercise (TTX), took place at the Centre for Security Science (CSS) in June 2013 and results were published in the After Action Report (AAR) in early July 2013.[4] The purpose of this exercise included conducting a proof of concept validating and improving a capability assessment methodology; in the end, providing valued input to the development of a more simplified version of CAMS.

The scope of the exercise included:

- Complementing the AHRA approach and conducted from a Health Portfolio perspective;
- Covering the Emergency Management (EM) timeline through the stages of Prevent, Prepare, Respond, and Recover as they relate to a pandemic scenario that affects Canada;
- Basing the capability framework on the Targeted Capabilities List – Canada (TCL-C) and include Governance and Common/Enabling capabilities that map across the continuum of response ;
- Defining capability gaps in terms of people, policies, processes and practices; tools and technology.

CAMS design was based in part on the work conducted to prepare and conduct the TTX. From Scenario Development to Exercise all approaches were reviewed and automation opportunities

[3] Peter Race and Doug Hales, *Public Safety Technical Program Planning Scenario Framework Final Report*; DRDC CSS Contractor Report (CR) CR 2010-10; Defence R&D Canada, Centre for Security Science; December 2010.

[4] Doug Hales, Peter Avis and Shaye Friesen, *Exercise Perseverance: Capability Assessment Table Top Exercise After Action Report*; DRDC CSS Technical Report (TR) DRDC CSS TR 2013-010; October 2013.

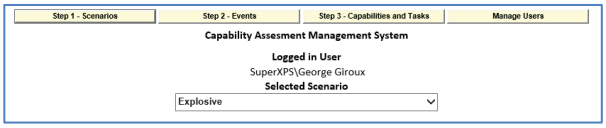
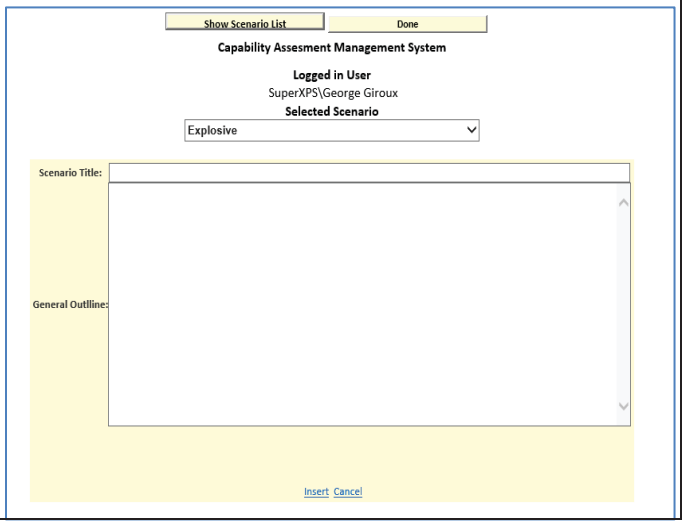
were identified. The CAMS design also incorporated parts of the FSSMS design of 2010 and was generally driven by the need for simplification in conducting capability analysis.

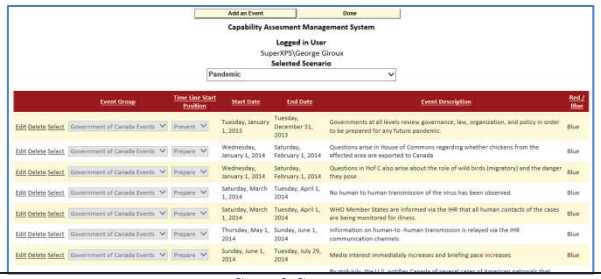
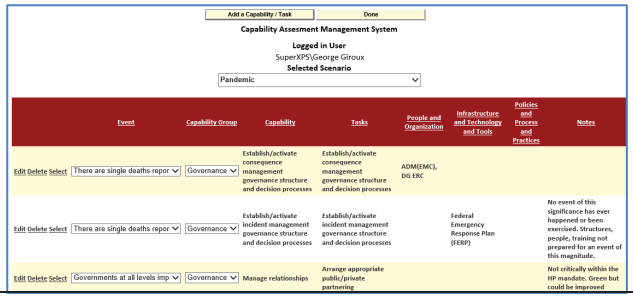
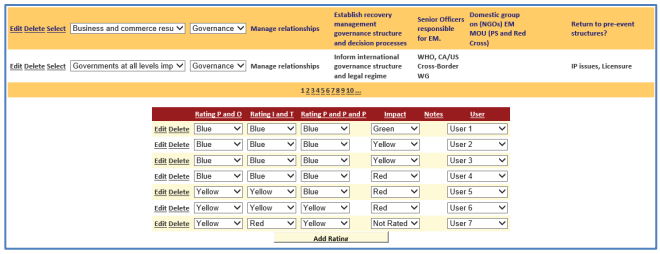
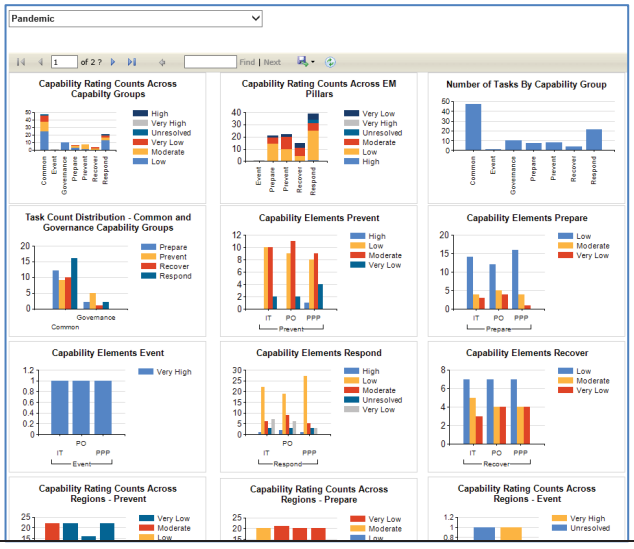
Tools used for the TTX were based on Microsoft Excel and manual data correlation techniques. CAMS automated capability analysis from Scenario Design to Capability Rating following the Steps outlined in the user's guide and leveraging lessons learned in implementing FSSMS.

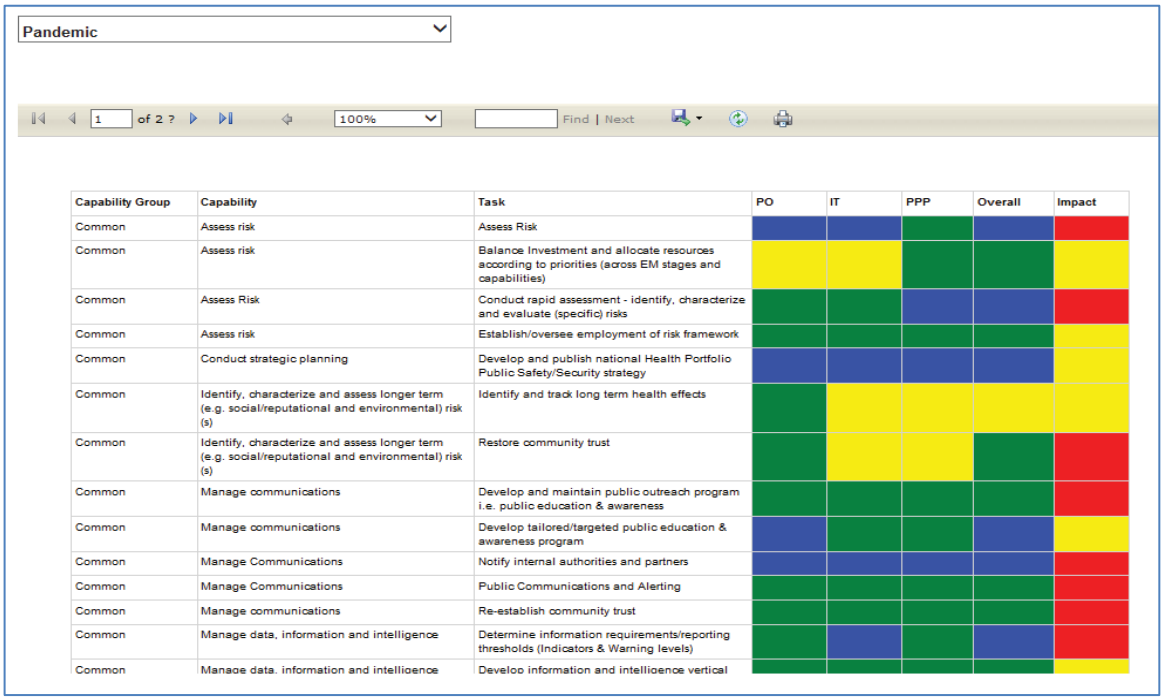
Two versions of CAMS have been developed. Both versions are very similar, the first is CAMS – PC which was built on the MS Access platform and the second is CAMS – On Line which is a .net application working closely with SharePoint. CAMS-PC is suitable for uses where sharing of access is not required over the internet/intranet and CAMS-On Line steps up to the network availability requirements by being available via a SharePoint interface.

The following expands on the CAMS alignment to the User's Guide. The CAMS was validated using the TTX data.

Table 1: Capability Assessment Management System – Main Processes

Step 1 Orientation	In step one the user crates a title for the scenario and documents a general outline of the scenario.	**Initial CAMS Screen**  **Step 1 Screen** 

Step 2 Scenario Development	The user records events against the scenario and associated them with start and end dates, the point in time and an event group (swim lane)	**Step 2 Screen** 
Step 3 Applying and Validating the Capability Framework	The user records capabilities and associated tasks against and event describing the task in terms of People and Organization, Infrastructure / Technology and tools and Policies / Process and Practices. A capability groups is also assigned to the capability.	**Step 3 Screen** 
Step 4 Identifying Capability Needs and Assessing Capabilities	The user selects a task and can enter a rating. Rating can be recorded for each rater or as a single consensus rating by a facilitator.	**Step 4 Screen** 
Step 5 Documentation and Presentation	Users can then produce the standard reports available with CAMS	**Step 5 Screen** 



Capability Group	Capability	Task	PO	IT	PPP	Overall	Impact
Common	Assess risk	Assess Risk					
Common	Assess risk	Balance Investment and allocate resources according to priorities (across EM stages and capabilities)					
Common	Assess Risk	Conduct rapid assessment - identify, characterize and evaluate (specific) risks					
Common	Assess risk	Establish/oversee employment of risk framework					
Common	Conduct strategic planning	Develop and publish national Health Portfolio Public Safety/Security strategy					
Common	Identify, characterize and assess longer term (e.g. social/reputational and environmental) risk (s)	Identify and track long term health effects					
Common	Identify, characterize and assess longer term (e.g. social/reputational and environmental) risk (s)	Restore community trust					
Common	Manage communications	Develop and maintain public outreach program i.e. public education & awareness					
Common	Manage communications	Develop tailored/targeted public education & awareness program					
Common	Manage Communications	Notify internal authorities and partners					
Common	Manage Communications	Public Communications and Alerting					
Common	Manage communications	Re-establish community trust					
Common	Manage data, information and intelligence	Determine information requirements/reporting thresholds (Indicators & Warning levels)					
Common	Manage data, information and intelligence	Develop information and intelligence vertical					

Figure 9: CAMS Capability Dashboard

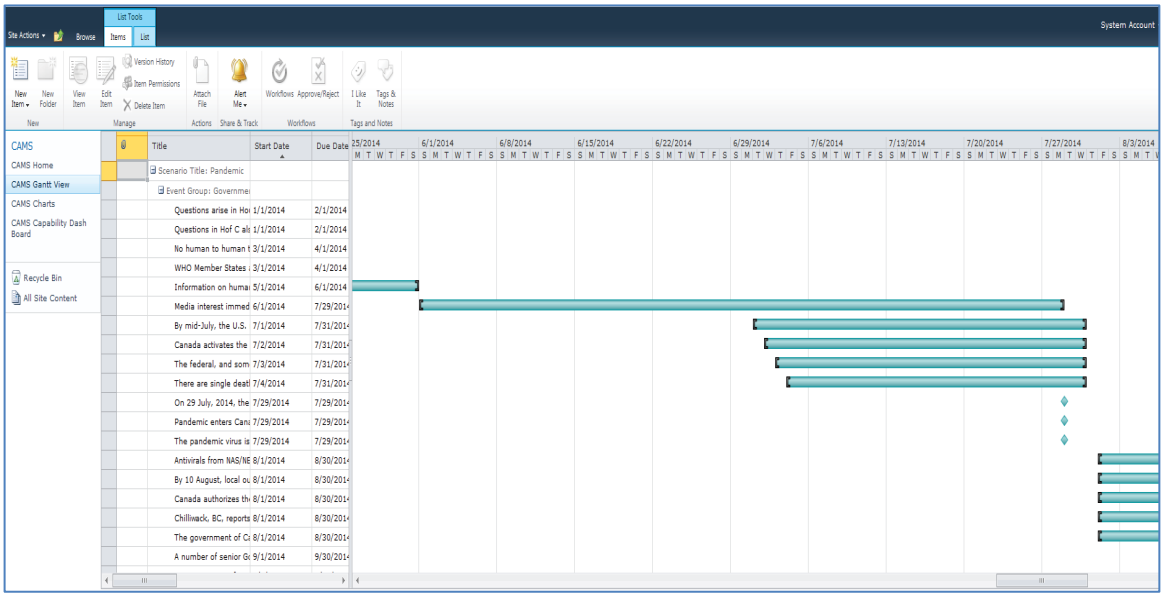


Figure 10: CAMS Capability Task Gantt View

4 Conclusion

This Technical Note has provided an overview of AHRA and CAMS applications. The next step is to "roll-out" the AHRA and CAMS applications into the hands of the end users. Collaborating with other government departments and agencies on a second phase will explore how the automated tools/techniques can be integrated into security risk assessment initiatives, capability audits, and evaluation activities as part of a larger training exercise. Testing and validation of the AHRA and CAMS applications will be undertaken on an ongoing basis.

References

Bayne, Ian, Jim Duncan, Brad Mills, Shaye Friesen, Alain Goudreau, *The Federal All Hazards Risk Assessment Framework Body of Knowledge: Volume1: Establishing an Information Baseline and Way Forward*; DRDC CSS TR 2013-014; Defence Research and Development Canada – CSS; September 2013.

Bayne, Ian; Jim Duncan; Brad Mills; Shaye Friesen; Alain Goudreau, *The Federal All Hazards Risk Assessment Framework Body of Knowledge: Volume II: Supporting Material;* DRDC CSS Technical Note (TN) TN-2013-015; Defence Research and Development Canada – CSS, September 2013.

Canada, Public Safety Canada, All Hazards Risk Assessment Methodology Guidelines, and 2012-13 (Ottawa: Public Safety Canada, 2012). Available at: http://www.publicsafety.gc.ca/cnt/rsrcs/pblctns/ll-hzrds-ssssmnt/index-eng.aspx.

Hales, Doug, Peter Avis and Shaye Friesen, *Exercise Perseverance: Capability Assessment Table Top Exercise After Action Report*; DRDC CSS Technical Report (TR) DRDC CSS TR 2013-010; October 2013.

Race, Peter, Doug Hales, Public Safety Technical Program Planning Scenario Framework Final Report; DRDC CSS Contractor Report (CR) CR 2010-10; Defence R&D Canada, Centre for Security Science; December 2010.

DOCUMENT CONTROL DATA

(Security classification of title, body of abstract and indexing annotation must be entered when the overall document is classified)

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.)

Centre for Security Science (CRTI/PSTP)
Defence R&D Canada
222 Nepean St. 11th Floor
Ottawa, ON Canada K1A 0K2

2. SECURITY CLASSIFICATION (Overall security classification of the document including special warning terms if applicable.)

UNCLASSIFIED
(NON-CONTROLLED GOODS)
DMC-A
REVIEW: GCEC April 2011

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.)

Overview of the All Hazards Risk Assessment (AHRA) Automated Application and Capability Assessment Management System (CAMS):

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

Friesen, S.K.; Giroux, G., Villeneuve, A.

5. DATE OF PUBLICATION (Month and year of publication of document.)

November 2013

6a. NO. OF PAGES (Total containing information, including Annexes, Appendices, etc.)

22

6b. NO. OF REFS (Total cited in document.)

5

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.)

Technical Note

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

Centre for Security Science
Defence R&D Canada
222 Nepean St. 11th Floor
Ottawa, ON Canada K1A 0K2

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.)

CSSP-2012-TI-1108

9b. CONTRACT NO. (If appropriate, the applicable number under which the document was written.)

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.)

DRDC CSS TN 2013-031

10b. OTHER DOCUMENT NO(s). (Any other numbers which may be assigned this document either by the originator or by the sponsor.)

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 aim of this Technical Note is to provide an overview of the automated All Hazards Risk Assessment (AHRA) application and Capability Assessment Management System (CAMS)

Le but de cette note technique est de fournir un aperçu du system de gestion de l'Evaluation Tous Risques (SG-ETR) et du système de gestion de l'Evaluation des capacités (SG-EC).

14. 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.)

All Hazards Risk Assessment; Capability Assessment; Capability Analysis; Emergency Management