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Research Using In Vivo Simulation of Meta-Organizational Shared Decision Making (SDM)

Task 3: Testing the Shared Decision Making Framework in Vivo

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Defence R&D Canada – Centre for Security Science
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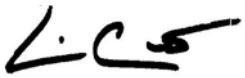

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Abstract

This report documents the completion of Task 3 of the work stream "Research Using in Vivo Simulation of Meta-Organizational Shared Decision Making (SDM)", one component of the Technology Innovation Fund (TIF) program on Meta-organizational Collaboration that has been designed to assist in understanding challenges faced by the Canadian Forces (CF). The objective of the stream is to conduct basic research into shared decision making through the analysis of case studies, exercises and simulations. Task 3 involved the development and testing of the shared decision making framework in vivo. The research at this stage is to demonstrate that the model when implemented *in vivo* can produce improvements in problem solving processes and outcomes such as better quality decisions, higher levels of satisfaction with problem solving processes, better time-to-satisfaction ratio and more cohesive multi-organization groups.

Résumé

Ce rapport traite de l'exécution de la Tâche 3 du projet intitulé : « *Recherche par la simulation in vivo sur la prise de décision partagée des méta-organisations* », une des composantes du programme du Fonds pour l'innovation technologique (FIT) relatif à la collaboration méta-organisationnelle, qui a été conçu afin d'améliorer la compréhension des défis auxquels font face les Forces canadiennes (FC)**.** L'objectif de ce volet particulier est de mener une recherche de base sur le partage des décisions au moyen d'études de cas, d'exercices et de simulations. La Tâche 3 consistait à élaborer le cadre de partage des décisions in vivo et d'en faire l'essai. À ce stade, la recherche visait à démontrer que le modèle, lorsqu'il est mis en œuvre *in vivo*, peut aider à améliorer les processus de résolution des problèmes et leurs résultats, notamment des décisions de meilleure qualité, de hauts niveaux de satisfaction en ce qui touche les processus de résolution des problèmes, un meilleur rapport temps-satisfaction et des groupes multi-organisationnels plus cohésifs.

Executive summary

Research Using In Vivo Simulation of Meta-Organizational Shared Decision Making (SDM) – Task 3: Testing the Shared Decision Making Framework *in vivo*

Louise Lemyre[1] et al.; DRDC CSS CR 2011-32; Defence R&D Canada – CSS.

Introduction: This report documents the completion of Task 3 of the work stream "Research Using in Vivo Simulation of Meta-Organizational Shared Decision Making (SDM)", one component of the Technology Innovation Fund (TIF) program on Meta-organizational Collaboration that has been designed to assist in understanding challenges faced by the Canadian Forces (CF). The objective of the stream is to conduct basic research into shared decision making through the analysis of case studies, exercises and simulations.

The objective of Task 3 is to test the shared decision making framework in vivo.

Method: Headed by Dr. Lemyre, the Gap-Santé research team at the University of Ottawa created a *Model for Inter-organizational Problem Solving* under Task 1 of the project. Task 2 involved the development of a research plan for an *in vivo* simulation experiment as well as qualitative interviews. Task 3 comprised testing the shared decision-making (SDM) framework using qualitative interviews with key decision makers having played a role in major events and testing an *in vivo* experimental simulation of shared decision making in a complex scenario.

Results: The research at this stage is to demonstrate that the model when implemented *in vivo* can produce improvements in problem solving processes and outcomes such as better quality decisions, higher levels of satisfaction with problem solving processes, better time-to-satisfaction ratio and more cohesive multi-organization groups.

[1] Dr. Lemyre is the McLaughlin Research Chair on Psychosocial Aspects of Risk and Health, Director of GAP-Santé at the Institute of Population Health, and Professor of Psychology, Faculty of Social Science, University of Ottawa

Sommaire

Recherche sur le partage de décision des méta-organisations en utilisant la simulation *in vivo* – Tâche 3 : Essai du cadre de partage des décisions *in vivo*

Louise Lemyre[2] et autres ; CSS RDDC CR 2011-32 ; R&D pour la défense Canada – CSS.

Introduction: Ce rapport traite de l'exécution de la Tâche 3 du projet intitulé : « *Recherche par la simulation in vivo sur la prise de décision partagée des méta-organisations* », une des composantes du programme du Fonds pour l'innovation technologique (FIT) relatif à la collaboration méta-organisationnelle, qui a été conçu afin d'améliorer la compréhension des défis auxquels font face les Forces canadiennes (FC). **L'objectif de ce volet particulier est de mener une recherche de base sur le partage des décisions au moyen d'études de cas, d'exercices et de simulations.**

La Tâche 3 a pour objectif de faire l'essai du cadre de partage des décisions in vivo.

Méthode : Sous la direction de M[me] Lemyre, Ph. D., l'équipe de recherche GAP-Santé de l'Université d'Ottawa a créé un *modèle de résolution inter-organisationnelle de problèmes* dans le cadre de la Tâche 1 du projet. La Tâche 2 consistait à élaborer un plan de recherche pour une expérience de simulation *in vivo* ainsi que des entrevues qualitatives. La Tâche 3, quant à elle, portait sur l'essai du cadre de partage des décisions au moyen d'entrevues qualitatives réalisées auprès des principaux décideurs ayant joué un rôle dans des activités d'importance et sur l'essai d'une simulation expérimentale *in vivo* du partage des décisions dans un scénario complexe.

Résultats : À ce stade, ;a recherche visait à démontrer que le modèle, lorsqu'il est mis en œuvre *in vivo*, peut améliorer les processus de résolution de problèmes et leurs résultats, notamment des décisions de meilleure qualité, de hauts niveaux de satisfaction en ce qui touche les processus de résolution des problèmes, un meilleur rapport temps-satisfaction et des groupes multi-organisationnels plus cohésifs.

[2] M[me] Lemyre, Ph. D., est titulaire de la Chaire de recherche McLaughlin sur le risque psychosocial, directrice de GAP-Santé, à l'Institut de santé des populations et professeure de psychologie à la faculté des sciences sociales de l'Université d'Ottawa.

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Acknowledgements

As principal investigator, Dr. Louise Lemyre wishes to acknowledge the funding made available by Defence Research and Development Canada (DRDC) for this important research initiative. We also want to thank all of our various partners and collaborators, especially those of DRDC, Canadian Forces and emergency response of all sectors who have shared their expertise in the development and refinement of the various components of the in vivo simulation experiment. Special thanks are also offered to those individuals and organizations that have assisted in recruiting participants for the experiment and to the participants themselves who have given their time to attend.

Preface

This document represents the initial draft of *Task 3: Testing the Shared Decision Making Framework in vivo*, and is submitted for review before a final document is prepared using the DRDC supplied template for Contractor reports. The work has been completed for Defence Research and Development Canada (DRDC) as part of the contract deliverable defined in the project entitled *Research Using In-Vivo Simulation of Meta-Organizational Shared Decision Making (SDM)*, Contract No.: W7714-083659/001/SV.

The document is a technical report that provides detailed descriptions of all of the materials, instruments, procedures and processes created to implement both the qualitative interview component of the study and the *in vivo* simulation exercise. The results of the scenario assessment process for determining complexity are included. Also included in this report are results from the multiple pilot testing of the simulation using different configurations of participants and pods and the plans formulated for conducting simulation exercise sessions with senior decision makers in early April and May 2011. A follow-on report is planned and will include detailed analyses and results for both the qualitative interview component and the senior level sessions of the *in vivo* experiment.

Document Distribution and Confidentiality

Document distribution and confidentiality protocols as specified in the contract noted above will apply to this document. Please contact Dr. Louise Lemyre, Principal Investigator, University of Ottawa, at louise.lemyre@uOttawa.ca should a change in protocols be requested. Please quote with due reference to Lemyre et al. 2011, Report on Research Using in Vivo Simulation of Meta-Organizational Shared Decision Making (SDM) – Task 3: Testing the Shared Decision Making Framework *in vivo*.

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1 Introduction

This draft report documents the completion status and results to-date of Task 3: Testing the shared decision making framework *in vivo.* Task 3 is one of five tasks to be undertaken to conduct basic research into shared decision making through the analysis of case studies, exercises and simulations. It builds on work completed under Task 1: Synthesis of Case Studies to form a SDM Framework (see figure below) and reflects the outputs of Task 2: Development of an experimental plan for *in vivo* exercise and simulation. Refer to report entitled, *Research Using In Vivo Simulation of Meta-organizational Shared Decision Making (SDM) Task 1: Synthesis of Case Studies to form a SDM Framework,* (Lemyre et al., 2009) for details on Task 1.

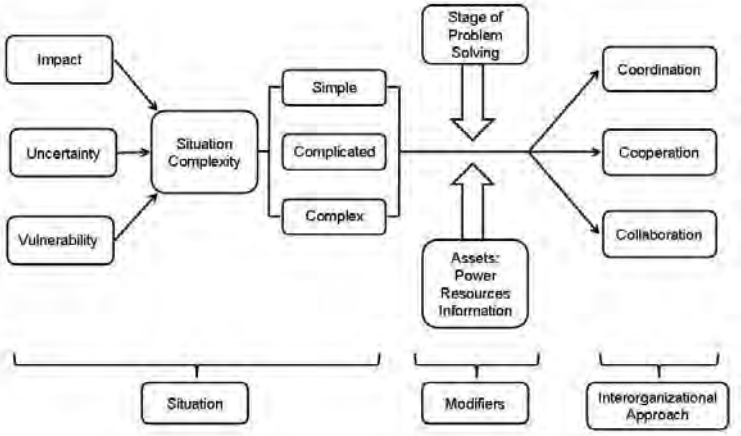

Figure 1: Model of inter-organizational problem solving

This report focuses on the implementation procedures and protocols for both the qualitative interview component of Task 3 and the in vivo simulation experiment. Detailed descriptions are provided of all materials utilised during the course of the testing undertaken to-date and the interview processes. While all materials and processes have been validated through extensive rounds of pilot testing, experimental sessions with senior decision-makers are presently being planned for April and May 2011. Given the required timing of this report, results for the experimental component will be limited in this report to relevant themes and observations from the multiple pilot tests that have been undertaken during Task 3. All of the qualitative interviews have been conducted but these are in the transcription and coding processes. After completion of these activities, analyses will be undertaken and findings integrated with those from the in vivo experimental sessions with senior officials.

1.1 Task 3 objective and components

The objective of Task 3 is to test the shared decision making framework in vivo. From the results of Task 1, identify scenarios that challenge the SDM framework, as well as the ICS framework, if the latter differs from the SDM framework. These scenarios will be exercised within the simulated environment designed in Task 2. Participants in the simulations will include individuals

from multiple levels of government, multiple jurisdictions and multiple disciplines according to the requirements of the particular scenario being exercised.

1.2 Research objectives, questions and strategy

The research objectives, questions and strategy were developed as part of Task 2 and a full discussion can be found in the report entitled *Research Using In Vivo Simulation of Meta-organizational Shared Decision Making (SDM) Task 2: Development of an experimental plan for in vivo exercise and simulation (Lemyre et al., 2010).* The figure below summarizes this information and is re-presented for reader convenience.

The research at this stage is to demonstrate that the model when implemented *in vivo* can produce improvements in problem solving processes and outcomes such as better quality decisions, higher levels of satisfaction with problem solving processes, better time-to-satisfaction ratio and more cohesive multi-organization groups.

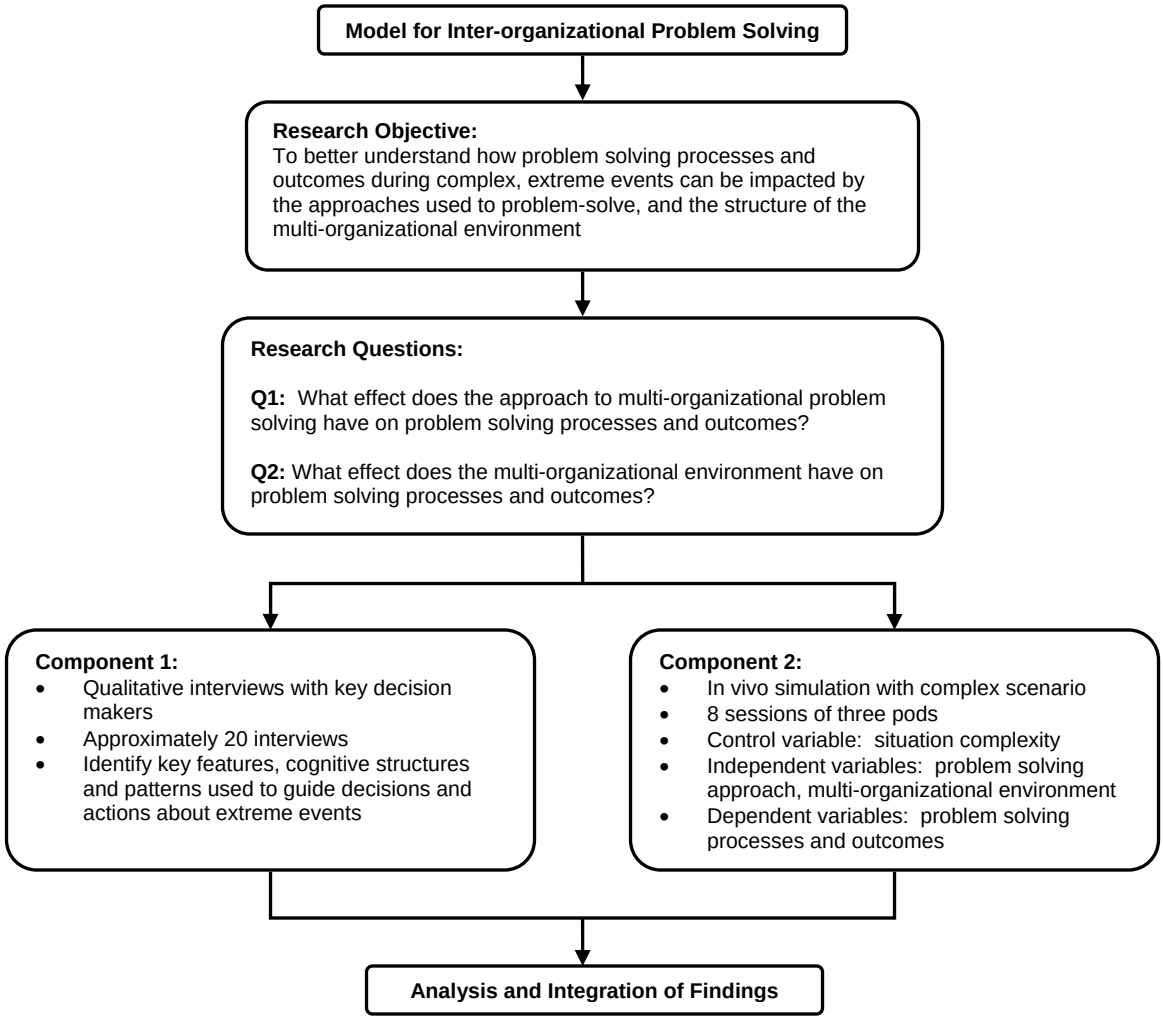

Figure 2: Overview of research strategy

1.3 Overview of report sections

This document is organized into three main sections with various sub-sections. The content for each of these sections is briefly described below.

SECTION 1 Introduction

- This section outlines the objectives of Task 3 and its qualitative and experimental components.
- Details are provided concerning the study`s research objectives, questions and strategies.

- The three sections of the report and what each section will contain are described.

SECTION 2 Component 1 – Qualitative interviews with decision makers

- This section outlines the qualitative interview research design and its rationale.
- Details are provided concerning the ethics approval process, the interview guide development and its contents, and the interviewee recruitment procedure.
- The data collection and analysis process is described.
- Next steps for the qualitative interviews focus on the directions of the final analyses.

SECTION 3 Component 2 – In Vivo Simulation experiment

- This section outlines the *in vivo* simulation experimental research design, and briefly describes the control, independent, and dependent variables.
- Details are provided concerning ethics approval, the ethics approval process as well as proper data storage and maintaining participant confidentiality through the use of participant identifiers.
- The rational for rating scenario complexity and its relation to the shared decision making model are discussed. The scenario development process, the scenario assessment and its results, as well as the scenario selection and refinement process are presented. Refinement of the rating scale for future research purposes is discussed.
- Developed instruments such as dependent measures, the background questionnaire, and the decision quality rating instrument are presented and described in terms of their development process, design considerations, review process, and their refinement.
- Development and assessment of simulation tasks are discussed. Details are presented on the rational for assessing simulation tasks, simulation tasks relation to the shared decision making model, and the task development and assessment process. Worksheets that correspond to the chosen tasks are presented.
- Details are provided concerning the development of the multimedia simulations, POD session roles, responsibilities and materials, recruitment methods, necessary equipment, facilities and software, and data collection and storage procedures.
- A pilot testing overview is presented along with results and information regarding changes made to simulation materials.

SECTION 4 Next Steps

- This section provides an overview of the remaining scheduled sessions with senior emergency management professionals.
- Data collection methods and planned analysis are also described with respect to both the qualitative interview component and the in vivo simulation component of the project.
- Finally, the upcoming task of modelling communication and decision making functions is described.

2 Component 1 – Qualitative interviews with decision makers

This section of the report presents an overview of the qualitative interview component of the project. The following items are described here: overview of the research design, ethics approval, interview guide development, recruitment, data collection, data analysis, and next steps.

2.1 Overview of research design

Qualitative research methods are often complementary to using quantitative methods. Qualitative methods elicit explanations, discover patterns, and understand relationships in the data that may be overlooked when only using quantitative methods. Qualitative methods help go beyond the scope of quantitative methods (Crotty, 1998; Smith, 2008). The present study uses qualitative findings from interviews with key stakeholders as a method to identify critical insights into elements of decision making processes during extreme events in real-life settings retrospectively (Nja & Rake, 2009) to aid in the planning, validation, analysis and interpretation of the quantitative *in vivo* experimental data. The interviews in the present study focus on the general process of problem solving, during which decision making is considered to be one of the key stages.

The present study uses the *Critical Decision Method* approach to interviewing (Klein, Calderwood & MacGregor, 1989) which has been simplified and adapted by other authors (e.g, Smith and Dowell, 2000; Nja & Rake, 2009). A semi-structured interview guide consisting of core questions and probes (Lindlof & Taylor, 2002) was used to conduct the interviews. The interviewer guided interviewees through the various stages of problem solving that had occurred during a previous extreme event, drawing out the interviewees' past experiences and interpretations. The main strengths and challenges to using this approach were discussed in the previous report "Research Using In Vivo Simulation of Meta-Organizational Shared Decision Making (SDM): Task 2: Development of an experimental plan for in vivo exercise and simulation".

2.2 Ethics approval

The qualitative interview component of the study obtained ethics approval from the Social Sciences and Humanities Research Ethics Board of the University of Ottawa. For details on the application and ethics submission please refer to *Section 3.2*.

2.3 Interview guide development

A semi-structured interview guide allows new questions to be asked based on the interviewees' conversational direction (Lindlof & Taylor, 2002). For the present study, a guide was developed to instruct the administration and implementation of the qualitative interviews. The guide was used for all interviews to ensure some consistency across interviews and increase the reliability of findings. The draft guide went through various iterations and pre-testing to ensure that the

interview was of an appropriate length (approximately 60 minutes), and that questions collected appropriate information from interviewees, were easy to understand, and flowed in a logical fashion.

The questions in the interview guide were based on the current study`s two main research questions described in *Section 1.2*. Nine interview questions along with additional probes were developed to address the two main research questions (see *Annex A*). Exact wording of the questions varied during interviews to accommodate the different situations or events being studied. The interview began with a brief introduction to convey some context to the interviewees, and was followed by some questions designed to collect some basic, factual information concerning the interviewees' background, an overview description of the selected event, and the selection of one or two challenging situations that had complex and multi-organizational characteristics. Once one or two situations had been selected, the interview focused on the chosen situations with questions designed to have the interviewee describe and reflect upon problem identification and definition, solution generation, decision making and implementation, sharing resources and flexibility, expectations and alternatives, and the three concepts of coordination, cooperation and collaboration.

2.4 Recruitment of interviewees

The inclusion criteria for participants for the qualitative interviews were that they were senior-level decision makers and managers who had participated in planning for and/or managing a major, extreme event in Canada within the past ten years. They would need to have played a strategic decision-making role during at least one major event such as the 2010 G-20 Toronto Summit, 2010 Vancouver Olympic Games, the 2009 H1N1 planning, the 2007 G8 meeting in Ottawa, or the, SARS outbreak in 2003. Other considerations included level of experience managing extreme events, and possessing the authority to make decisions regarding allocation of resources on behalf of their organization with respect to major events. Some potential interviewees were identified via the professional networks of research team members. Others were identified through referrals from key senior managers and decision-makers who participated in the same events.

One goal of the interviews was to ensure that there was some diversity among interviewees with respect to the type of decision/command structures that were characteristic of their organizations. As a result, an effort was made to recruit key decision makers from a variety of organizations that follow different command structures. Three types of organizations were targeted:1) military organizations that employ a C2 structure (e.g. Canadian Forces); 2) service organizations that rely primarily on the Incident Command System (ICS) approach to planning for and responding to extreme events (e.g., EMO); and 3) organizations that follow less hierarchical, more distributed and less prescriptive decision-making processes (e.g., NGOs, community organizations, health authorities).

Given the inherent challenges involved in the recruitment of senior-level decision makers, a flexible recruitment process was developed involving various stages and procedures which included identifying potential interviewees, making initial contact (see *Annex B* for the e-mail invitation), securing agreement to participate, scheduling interviews, obtaining informed consent, and conducting the interviews.

2.5 Data collection

All interviews were conducted by senior-level interviewers with advanced knowledge and experience with qualitative interviewing techniques. Prior to the interview starting, interviewees were provided with detailed information about the study via an information sheet that accompanied the consent form. The information and consent form was approved by the University of Ottawa Research Ethics Board and is in compliance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS). The interviewer would guide the interviewee through the informed consent process, asking them if they had any questions or required any further clarification prior to signing the form indicating their consent to participate in the interview. (See *Annex C* for the participant consent form).

Once informed consent was obtained, the interviewer proceeded with the interview using the interview guide. (See *Annex A* for the qualitative interview guide). Interviews were semi-structured, with open-ended questions asked, followed by probes designed to elicit more detailed information. All interviews were audio-taped, with tapes later transcribed verbatim.

As of the timing of this report, ten participants had been recruited and interviewed, eight in the Toronto area and two in the National Capital Region, from military, ICS and non-ICS organizations. Interviews lasted on average 60 minutes in duration.

2.6 Data analysis

In qualitative research, often a larger emphasis is placed on the depth and details of the data than on the breadth and representativeness of data. Each qualitative interview is treated as a rich source of information that broadens the researcher's understanding, that when combined with the information collected from other interviews will demonstrate patterns and themes, along with explanations and examples.

The verbatim transcripts of the interviews were imported into an analytic software program designed to assist with categorizing, and assembling qualitative information so that trends and patterns can be analyzed. Initially, analysis of the transcripts began with identifying meaningful units of information that are related to situation complexity (i.e., simple, complicated, and complex). This was followed by identifying units of information by expected themes (e.g., multi organizational environment, approach to problem solving, problem solving stage) and emerging themes. Data coding (i.e., assigning text or units of information to categories) was conducted in a cascading manner, where data was categorized into a small, broad number of categories.

2.7 Next steps

At the timing of this report, recorded interviews are currently being transcribed. Once the transcriptions have been completed, the detailed analyses will begin. All transcripts will be imported into analytic software and follow the analysis process as described in *Section 2.6 Data Analysis*. Once a small number of broad categories are identified from the interviews, these categories will be coded into additional levels of subcategories to specify certain themes. To ensure reliability of the coding scheme and analysis, two researchers will recode 10% of the interviews, and then these coding results will be compared. Finally, results will be linked with the

quantitative experimental *in vivo* component, and will aid in the interpretation of the quantitative findings.

3 Component 2 – In vivo simulation experiment

This section describes the second major component of the project – the in vivo simulation experiment. An overview of the research design for the in vivo experiment is presented along with a description of the ethics approval process. This portion of the report also describes our methods for determining situational complexity; the instruments used in the experiment; scenario and task development; the development of the final multimedia version of the simulation scenario; the roles, responsibilities and materials associated with each of the actors involved in the experiment; the recruitment process; the equipment, facilities, software and set-up required to run the experiment; as well as a description of the pilot testing phases of the experiment.

3.1 Overview of research design

In order to test the model for inter-organizational problem solving, an in vivo simulation experiment was developed. This simulation experiment is in keeping with Jonathon Crego's work on the HYDRA simulation training system (Alison & Crego, 2008); however, the *Inter-GAP In Vivo System* developed by Lemyre et al. (2010) looks not only at *intra*-organizational problem solving but also at *inter*-organizational problem solving. The research design assumes a complex situation within which decision makers have to undertake a number of tasks characterized as either "coordination" or "collaboration".

During an *Inter-GAP* simulation system session, groups of three participants are organized into pods which are equipped with communication equipment. These teams work through a simulated emergency event while their communications, interactions (both within pods and between pods) as well as the decision making processes are recorded for later analysis. Three of the teams are able to communicate between the pods, while a fourth team is used as the control group, and is not given the communication tools to interact with the other pods (see *Figure 3* below for the overall session composition). The session is delivered via a separate control room using video conferencing software, where the scenario, tasks, and injects are delivered according to a set schedule. Facilitator-led briefing and debriefing sessions are used to orient the participants to the materials and technology used in the experiment and to gain informed consent from each participant.

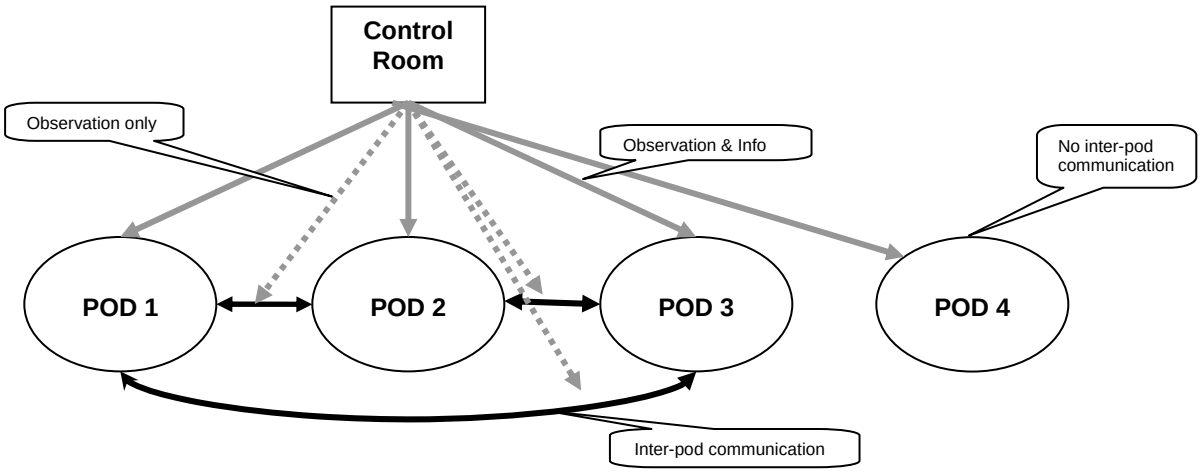

Figure 3: Overall session composition

3.1.1 Description of variables

The independent variables that were manipulated during the experiment are a) Approach to problem solving, and b) Multi-organizational environment. Approach to problem solving includes two levels (Coordinating; Collaborating). Multi-organization environment includes two levels of pod composition (Homogeneous organizations; Mixed types of organizations), and two levels of inter-pod interaction (Closed interaction; Open interaction).

The main dependent variables are problem solving processes and outcomes such as decision quality, satisfaction with problem solving process according to actors and to external panel, task cohesion, participation, time and agreement. For a more detailed description of the independent and dependent variables see the previous report "Research Using In Vivo Simulation of Meta-Organizational Shared Decision Making (SDM): Task 2: Development of an experimental plan for *in vivo* exercise and simulation".

3.2 Ethics Approval

Before the execution or testing of any of the components of the *in vivo* simulation of meta-organizational shared decision making project, ethics approval had to be granted. Therefore, observing the guidelines and regulations from the University of Ottawa Ethics Research Board and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS), the ethics application involved a meticulous and arduous effort from the project team to submit a complete application under the minimal risk review process category for the experimental part, and as a modification for a research project for the qualitative component.

As a result, the University of Ottawa Research Ethics Board complying with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS) and other legislations, examined and approved the application for ethical approval of the Risk Management and

Governance: Understanding Problem Solving and Decision Making (File # 08-10-31), granted as of September 14th 2010 (See *Annex D* for the Ethics Approval Letter).

3.2.1 Ethics approval process

The application for ethics approval was submitted as a minimal risk review, which is used for studies that pose minimal risk to the participants rights and safety, and that comply with the principles of free and informed consent, privacy and confidentiality, appropriate balance of risks and benefits, between others. The ethics application addressed research protocols, methodologies and processes, recruitment and selection of participant's processes, benefits and risks posed to the participants, the consent process, as well as the privacy, confidentiality and anonymity of the participants.

Consequently, the ethics application included the submission of the following documents (*Annex E*, & *F*), for both the qualitative and quantitative components:

- An invitation email for recruitment
- A participant consent form

Specifically the qualitative component required the submission of the qualitative interview guide (See *Annex A*), while the quantitative *in vivo* simulation experiment required the participants' questionnaires (See *Annex G*), and the description of the scenario injects (Please refer to *Section 3.6*).

3.2.2 Data storage and participant identifiers

In compliance with the Tri-Council Policy Statement: Ethics Conduct for Research Involving Humans (2008, p.44), "The duty of confidentiality includes obligations to protect the data from unauthorized access, use, disclosure, modification, loss or theft". Different procedures were developed to ensure that all data, including written records, consent forms, questionnaires, video and audio tapes will be maintained in a locked filing cabinet within a locked office within the secure zone of the Faculty of Social Sciences research centre at DMS 3rd floor. All electronic files (including digital audio and video recordings) with participant data are being encrypted and password protected. The files will be stored on a dedicated server to which only the research team has access. The data will be conserved for a period of 10 years once the relevant publications have been produced. During the conservation period, all hard copy data (e.g., questionnaires) will be stored in a locked filing cabinet at the University of Ottawa. Electronic files will remain encrypted, password protected and stored on a server to which only the research team has access.

Once the conservation period is over, the hard copy data will be shredded and the electronic files will be deleted via secure deletion methods.

Each participant will be labelled with a different participant identifier to ensure participant confidentiality and proper tracking of data. Participant identifiers consist of five numbers: the first two numbers indicate the session number, the third number indicates the session type (1- coordination, 2- collaboration), the fourth number indicates the pod number, and the fifth and last number indicates the participant number (up to three participants per pod). For example, the

number “05112” indicates this participant is part of session five, is in a coordination session, is part of pod one and is participant two in this pod. These identifiers will be used to label each participant’s documents. These documents include: participant consent forms (see *Annex F)*, background questionnaires (see *Annex H)*, confidentiality and intellectual property agreements (see *Annex I)*, participant identification and information linking forms (see *Annex J)*, task worksheets (see *Annex K)*, task questionnaires (see *Annex G)*, and consistency of interpretation questionnaires (see *Annex L)*.

These documents will be stored in a secure environment indicated in *Section 3.9.6 Data Collection and Storage*. Data that contains participant’s names, such as consent forms, background questionnaires, confidentiality and intellectual property agreements, and participant identification and information linking forms, will be stored in a different location than the participants’ worksheets and questionnaires to avoid linking data with individual participants.

3.3 Determining scenario complexity

The PODS experiment is designed to measure the impact that the approach to multi-organizational decision-making and the types of multi-organizational environments have on problem solving processes and outcomes during complex extreme events. Thus, the experimental design involved holding situational complexity constant as a control variable, while the following independent variables were manipulated: Approach to problem solving (collaboration or coordination), as well as Multi-organizational environments (homogeneous or mixed; and open or closed).

In keeping with the experimental design, the simulation needed to reflect a high level of complexity characteristic of an extreme event. This was achieved by keeping the factors and elements that contribute to situation complexity at the forefront of the writing process. These factors and elements are a part of the *Model for Inter-Organizational Problem Solving* devised during Task 1 of this project (see *Figure 4* below for a breakdown of these factors and elements within the model). Rating scales were subsequently developed and utilized by expert reviewers to ensure that a complex event was indeed being portrayed in the simulation.

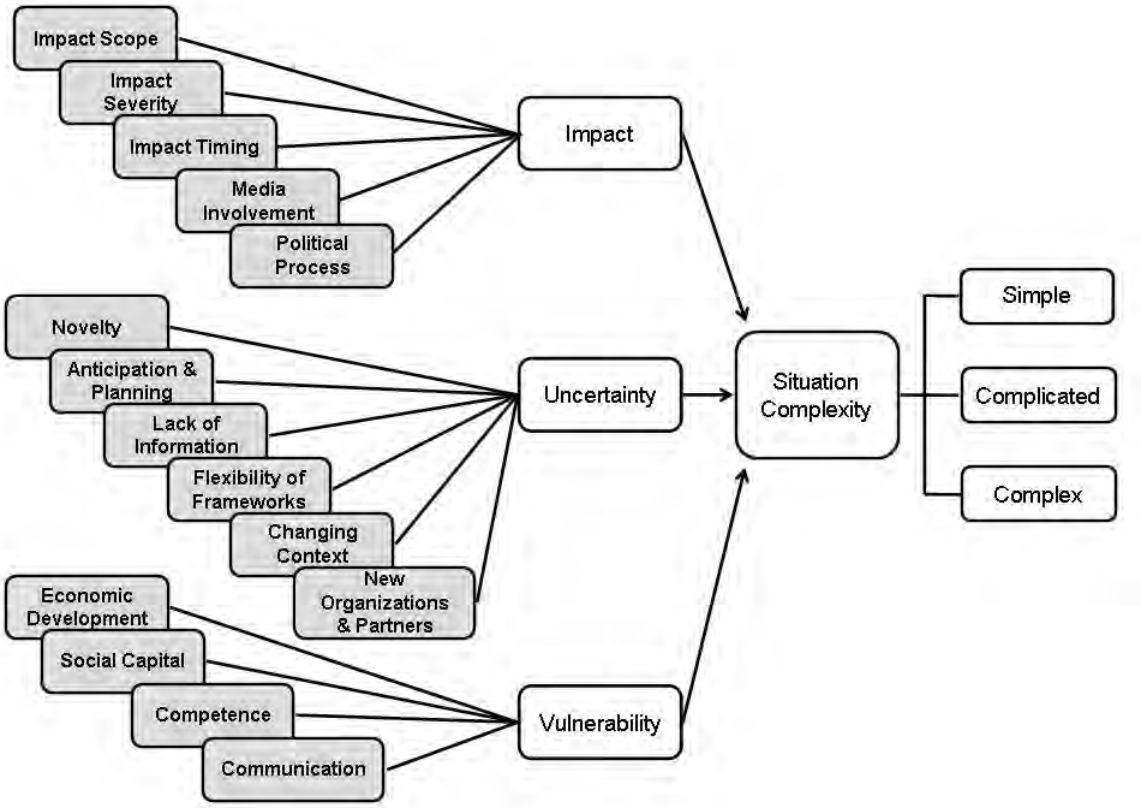

Figure 4: Factors and elements contributing to situation complexity

3.3.1 Scenario development process

Three separate scenarios (see *Annex M*) were developed for the scenario assessment process. A detailed simulated city was used to situate these scenarios. This fictional city, entitled *Gapville*, is a mid-sized Canadian city, located close to an international border, and features all of the requisite infrastructure, populations, and development to provide a simulation with a high degree of realism. This intricate backdrop became the backbone for three simulation storylines: 1) a train derailment and chemical contamination scenario; 2) a cyber attack and blackout scenario; and, 3) a radiological 'dirty bomb' scenario. All three scenarios were written using peer-reviewed research, salient technical reports, and existing federal, provincial, and local emergency plans to guide the accuracy of the events in the scenarios.

3.3.1.1 Scenario design and selection considerations

Three main design considerations guided the development of the scenarios – (1) degree of complexity, (2) accuracy, and (3) plausibility were paramount considerations not only in constructing the scenarios, but also in the assessment and selection process. The importance of designing a scenario with a high degree of complexity has already been noted, but accuracy and plausibility were also essential design considerations. Accuracy was wanted (especially in technical or scientific areas) since it adds to the realism of the scenario and encourages

participants to engage with the content and not "fight" it. Disagreements among participants about technical details may cause them to lose focus on the tasks to be completed. Also, given the *in vivo* aspect of the study, the scenario selected must have the potential to actually occur. Scenario plausibility was needed for participants to willingly suspend their disbelief during the experiment.

3.3.2 Scenario assessment process

For this experiment, three scenarios were developed and assessed using focus groups and interviews held with experts in the field of emergency management. The scenarios were validated for accuracy, plausibility and degree of complexity using a scenario rating assessment questionnaire. The scenarios assessed included (1) a train derailment and subsequent chemical contamination scenario; (2) a cyber attack scenario occurring in conjunction with a blackout and extreme winter weather; and (3) a radiological attack, or 'dirty bomb' scenario.

3.3.2.1 Identification and selection of reviewers

Raters of scenarios were screened to meet a set of inclusion criteria (see *Table 1*). Reviewers were chosen based on their expert level knowledge of emergency management and their membership in organizations that respond to or manage extreme events. More than fifteen invitations were sent to potential participants. Eight experts (seven males and one female) participated in the expert rating session held at the University of Ottawa on October 17th, 2010 (see *Table 2* for a list of participant organizations). Additional meetings were held with participants on an individual basis as schedules allowed. Participating organizations included Federal, Provincial and Municipal agencies responsible for health, safety, security and defence tasks. Data from the rating questionnaires were entered into SPSS and frequencies were analyzed.

Table 1: Inclusion criteria for selecting reviewers

Inclusion Criteria
1. Expert knowledge of emergency management and response to extreme events
2. Member of an organization involved with emergency response or management
3. Able and willing to volunteer to participate in the study
4. Able and willing to participate in English

Table 2: List of Participant Organizations

Sector/Type of Organization	Organizations
Other Federal Government Departments and Agencies	• Public Safety • Canadian Forces

Provincial Government Departments and Agencies	• Office of Disaster Management, Manitoba Health
Municipal Government Departments and Agencies	• Ottawa Public Health • Ottawa Fire Department • City of Ottawa

3.3.2.2 Scenario rating assessment questionnaire

A *Scenario Assessment Guide* (see *Annex M*) was developed to guide raters through the scenario assessment process. The reviewers were asked to complete a consent form and a confidentiality form at the outset of the rating session. Next, raters were given some background information on the project and given instructions on how to fill out the rating instrument. Prior to beginning the assessment of the scenarios, these raters also filled out a *Background Questionnaire* (see *Annex M.3*) which contained questions of a socio-demographic nature. The expert reviewers then read over the three written scenarios and filled out the *Scenario Assessment Questionnaire* (see *Annex M.6, M.8 & M.10*).

The *Scenario Assessment Questionnaire* was comprised of 22 questions designed to capture a reader's understanding of what contributes to the complexity of a given scenario. All three scenarios were assessed using the same questionnaire. First, reviewers were asked to rate each scenario as 'simple', 'complicated' or 'complex.' Potential contributions to complexity for a scenario were described in terms of impact, uncertainty and vulnerability, with specific challenges or areas noted for each. After reading the scenario, the reviewers were then asked to rate the degree to which each challenge was evident in the scenario. Answers were given based on a 5-point Likert scale ranging from 0 (not at all evident) to 4 (strongly evident) for each potential contribution. Then reviewers were asked which of the factors contributed most to the level of complexity of a given scenario and to explain their choice of answer. Here, reviewers chose between 'impact', 'uncertainty', 'vulnerability' or 'all of the above.' Reviewers were also asked to rate the overall level of complexity of the scenario on a Likert scale of 0 (not at all complex) to 4 (very complex). Finally, reviewers rated their level of agreement with the plausibility of the scenario on a scale of 0 (strongly disagree) to 4 (strongly agree). The results were compared with data collected from other reviewers to select a suitably complex scenario for use in the simulation exercise.

Focus groups and meetings with individual reviewers also involved unstructured discussion of the scenarios. This generated valuable feedback. These discussions allowed experts to address specific issues of technical and scientific accuracy within the scenarios, and to describe positive and negative aspects choosing one scenario over another based upon their own experience in responding to extreme events.

3.3.3 Scenario assessment results

The scenario assessment results include focus group comments, written commentary from the *Scenario Assessment Guide*, and the results from the scenario assessment questionnaire.

3.3.3.1 Focus group comments and observations on scenarios

At the end of the focus group session, reviewers indicated that the most complex scenario was the radiological/nuclear *Mail Scenario,* followed by the *Train Scenario,* and lastly the ice storm and cyber attack *Blackout Scenario*. In addition, reviewers stated that the final scenario should be one in which many actors can have credible roles.

Focus Group Comments on the Blackout scenario

Reviewers felt that the cyber attack and the ice storm were completely separate streams of activity in terms of response. One reviewer thought this scenario was reasonably complex, while another felt we had underplayed the impact on critical infrastructure. Another reviewer thought this scenario was not realistic enough and stressed that the military would be of last resort only.

Focus Group Comments on the Mail Scenario

Overall, raters felt that the scenario was very complex. Reviewers cited a number of factors contributing to the high level of complexity in the scenario. These included:

- The closure of the hospital, which would be a major event causing many ripples province wide
- The issue of public trust
- The emergence of “for-profit experts” (e.g. sale of Prussian blue online)
- Containment issues from the blown out window from the initial explosion
- Cross-jurisdictional issues
- The arrival of international media
- Public affairs and communication issues
- Response would be 125% reactive and still not get it right and, as a result, the intelligence community will be accused of failure.

Suggestions were made to increase the level of complexity further, to provide an even greater opportunity for the military to play a significant role. A suggestion was made by one reviewer to make the decontamination side more evident, stating that, “it really becomes a logistics and communications nightmare to be able to go to peoples' homes and places of work to collect contaminated clothing.” It was also suggested that the second event in this scenario would not have to occur to add to the complexity of the situation. A threat would also draw resources away, necessitating more help from other levels and organizations.

Raters discussed the potential actors in the scenario. These comments include:

- Once the municipality cedes control, it assumes a support role, posing communication problems
- The Province would have to make an official request to the Feds for help
- The military is linked in as soon as the Province communicate with the Feds

- NGOs would not want to participate, given the nature of the event
- As support to the R.C.M.P., a national security response team would be called in

The timeline of the scenario was questioned by reviewers. Raters stated that first responders (fire) would know quickly that it was a radiological event as they wear detection gear when on the scene. Additionally, it was felt that the timeline for this scenario could be reduced to several hours rather than several days. Reviewers stated that, depending on the type of event, troops would be available within 6, 12, or 24 hours.

Focus Group Comments on the Train Scenario

One reviewer considered this scenario to be complicated, but not complex because it did not include a criminal element and because authorities have dealt with these types of situations before (though perhaps not on the same scale). Reviewers found this scenario to be believable. However, the reviewers requested more details on demographics, critical infrastructures, existing response capacity, and size of the community affected. Overall, the two biggest issues reviewers saw with this scenario were public health and the clean-up (i.e., consequence management).

The timing of the scenario was also questioned. Reviewers stated that responders (i.e. fire) would discover quite quickly (under an hour) what the chemical was and set up a perimeter as prevention. Furthermore, reviewers stated that the Hazmat team would arrive on scene in under an hour as well. Reviewers from Public Safety focused on national and international resources. They felt that the local community would declare an emergency very quickly and request assistance and the military would provide security. Reviewers envisioned that the Province would take the lead at first, followed by Public Safety at the Federal level along with Health Canada.

A suggestion from a reviewer was to make this scenario more complex at the site level by adding cars containing chemicals that would react with the breached car. Another suggestion for increasing situational complexity was to add a national security issue (i.e. a terrorist cause).

One of the individual meetings yielded an important observation about the *Train Scenario*, namely that while the content of the scenario may be accurate, it is not plausible within a Canadian context. The problem of plausibility the reviewer spoke of relates to the fact that the chemical being transported in the scenario is more frequently manufactured and used on site. Transportation of this chemical is generally avoided, precisely because of the impacts described in the written scenario. Thus, it was felt that the radiological/nuclear scenario was more plausible.

3.3.3.2 Written comments and observations on scenarios

A number of the reviewers chose to write comments on the scenarios in the margins of their *Assessment Guides*. These comments are summarized below.

Written Comments on the Blackout scenario

Reviewers indicated that the timing of interventions throughout the day was more delayed than they would be in reality. For instance, one reviewer stated that hospital overflow would be mitigated at an earlier time than indicated in the scenario. A second reviewer pointed out that

action on the part of the local community networks would take place earlier than indicated. A third stated that it took too long to realize that the computers did not work. This reviewer also expected the power restoration to be outlined as a priority earlier in the scenario. In addition, one reviewer thought that it was not likely for the community center's generator fuel to last only one night and that it would be more likely that patients would be moved out of affected areas and/or discharged into family care.

Reviewers requested the addition of more specific dates, the geographical size of *Gapville*, and the population size of *Gapville*. Clarification was also requested with respect to the actors involved, and suggestions were provided by reviewers. For example, one reviewer stated that the province would provide aid before asking for resources at the federal level. Another reviewer viewed the armed forces as a last resort resource that was not necessary in this scenario. Another reviewer disagreed that police would still be at the hospital seven days after the initial crisis. Finally, one reviewer suggested multiple clarifications on the figures responsible at each stage of the scenario. For example, the reviewer would prefer the phrase "the head of the hospital" to be replaced with terms such as "the hospital administrator" or the "executive director."

Written Comments on the Mail Scenario

Reviewers indicated issues with respect to timing and actors involved in the scenario. More detail in terms of numbers, scope, capacity and demographics were also requested.

As was the case with the *Blackout Scenario*, there was a request for clarification in terms of the responders present. For example, when the 'dirty bomb' is sent to the television station, two reviewers indicated that the police should have been contacting the R.C.M.P. and not the military. One reviewer suggested that it should be the National CBRN Response Team that should be intervening rather than the HazMat team and the federal investigators. Furthermore, this reviewer remarked that the military would not be capable of setting up decontamination sites, as is done in the scenario. It was suggested that volunteer organizations be used to help handle the flow of traffic, enforce the evacuation zone, and provide shelter and support for displaced persons. In terms of identifying the perpetrators responsible for the dirty bomb, one reviewer suggested that it should be the Feds investigating rather than the local police.

The timeline was also mentioned by reviewers. One reviewer felt that exposure estimates should have been given much earlier in the scenario. Another reviewer pointed out that it would be helpful to know the month and year the scenario occurred in. In addition, this reviewer felt that the timeline was too long and unrealistic. Another reviewer wanted more clarification regarding the amount of time it took for the screening and treatment process at the hospital. Two reviewers stated that public notification should occur and a state of emergency should be declared during the scenario. Finally, a reviewer noted that the military would arrive within 4 hours, not 72.

Written Comments on the Train Scenario

Reviewer comments indicated that they would like more specifics about the scenario. For instance, specifics were requested regarding the type of respirators paramedics wore (two reviewers), the size of *Gapville*, and the number of citizens in *Gapville* (three reviewers), the number of people living in the 11km radius of the evacuation zone (one reviewer), and the weather conditions (one reviewer). Finally, clarification was suggested when using words like "authorities" to indicate who exactly these authorities were (one reviewer).

As in the other two scenarios, there were comments regarding delays in the timeline and the responders involved. One reviewer suggested that international assistance should be requested, and three reviewers pointed out that the involvement by the Feds should occur right away rather than the day after the initial crisis. One reviewer pointed out that a state of emergency should be declared.

3.3.3.3 Quantitative Analysis of Scenario Ratings

This section describes the quantitative results from the *Scenario Assessment Questionnaire*. In terms of the overall level of complexity, it was found that the *Train Scenario* had the highest complexity rating. The *Mail Scenario* was the second most complex and the *Blackout Scenario* was the least complex of the three. See the table below for the mean level of complexity for each scenario, measured on a Likert scale from not at all complex (0) to very complex (4).

Table 3: Mean Level of Complexity by Scenario

	Blackout		**Mail**		**Train**	
	Mean (n)	**Mode**	**Mean (n)**	**Mode**	**Mean (n)**	**Mode**
Mean Level of Complexity	2.8 (5)	2;4	3.0 (5)	3	3.2 (5)	4

The results of the above table are also reflected in the average mean of the complexity factors, with the Train Scenario having the highest mean complexity factor, followed by the Mail Scenario and the Blackout Scenario. The mean of the impact factor was highest for the *Train Scenario*. Uncertainty factor means varied little across the three scenarios, with the *Blackout Scenario* having a slightly higher mean level of uncertainty. Likewise, vulnerability factor means did not vary significantly, though the vulnerability mean was marginally higher in the *Mail Scenario* and *Train Scenario*. The table below summarizes the key findings from the assessment questionnaire on the factors of impact, uncertainty and vulnerability, providing the means and modes separated by scenario.

Table 4: Means and Modes of Factors and Elements by Scenario

	Blackout		**Mail**		**Train**	
	Mean (n)	**Mode**	**Mean (n)**	**Mode**	**Mean (n)**	**Mode**
Average Mean of Complexity Factors	2.5	N/A	2.7	N/A	2.8	N/A
IMPACT						
Impact Severity	2.5 (6)	2	3.6 (7)	4	3.9 (7)	4
Impact Scope	3.2 (6)	3	3.4 (7)	4	3.9 (7)	4
Impact Timing	3.0 (5)	2;4	3.0 (7)	3	3.6 (7)	4
Media Involvement	2.2 (5)	2	2.6 (7)	2	3.4 (7)	4
Political Processes	3.2 (5)	3;4	3.3 (7)	3	3.6 (7)	4
Mean of Impact Factor	**2.8**		**3.2**		**3.7**	
UNCERTAINTY						
Novelty of a Situation	3.0 (6)	4	2.9 (7)	4	2.4 (7)	2
Anticipation and Planning	2.0 (6)	2	1.8 (5)	2	2.5 (6)	2;3
Data and Information	2.0 (5)	2	2.1 (7)	1;2	2.4 (7)	2

New Organizations and Partners	2.4 (5)	2	1.7 (6)	2	1.8 (6)	1
Changing Context	3.0 (6)	3	3.0 (7)	2;3;4	2.9 (7)	2
Flexibility of Interpretive Frameworks	2.4 (5)	2	2.3 (6)	2	2.0 (7)	2
Mean of Uncertainty Factor	**2.5**		**2.3**		**2.3**	
VULNERABILITY						
Economic Development	2.4 (5)	2	2.2 (6)	1 ; 2	2.2 (6)	1;2
Social Capital	2.0 (6)	2	3.0 (7)	4	2.6 (7)	3
Community Competence	2.0 (5)	2	2.5 (6)	2	2.0 (7)	2
Information and Communication	2.0 (5)	2;3	2.7 (7)	2; 3;4	2.9 (7)	4
Other Infrastructure	2.6 (5)	2;4	2.3 (6)	2	2.9 (7)	2
Mean of Vulnerability Factor	**2.2**		**2.5**		**2.5**	

** Note: (n) is the number of item respondents

Quantitative Analysis of the Results for the Blackout Scenario

Of the six reviewers who responded, half (50%) rated the overall scenario as complicated, where the other half (50%) rated it as complex. Reviewers were asked which factor contributed most to the level of complexity in the *Blackout Scenario*. Of the six reviewers who responded, the majority (three) chose impact, two chose vulnerability, one chose all of the above, and none chose uncertainty. This response was reflected in the means for each factor, whereby impact had the highest mean (2.8), uncertainty had the second highest (2.5), and vulnerability had the lowest mean at (2.2). Impact scope and media processes had the highest means among the elements making up these factors.

Reviewers were also asked to rate their level of agreement with statements on the scenario's realism and plausibility. Of the four reviewers who responded, two reviewers were neutral and two were in agreement (one agree, one strongly agree) with the statement that the first part of the scenario was realistic and plausible. The majority (three) were neutral, and one agreed with the statement that the second part of the scenario was realistic and plausible. Lastly, all four of the reviewers who responded were neutral with the statement that the timeline part of the scenario was realistic and plausible.

Quantitative Analysis of the Results for the Mail Scenario

Of the five reviewers who responded, the majority (60%) rated the Mail Scenario as complex and 40% rated it as complicated. Results were mixed concerning the reviewers' estimations of which factor contributed most to the level of complexity in the scenario. One reviewer stated that it was impact, one stated uncertainty, and two stated vulnerability. Two reviewers reported all of the above; indicating that they felt all three factors influenced the assessment equally.

Results were mixed in terms of questions on realism and plausibility. The majority agreed that the first part of the scenario was realistic (two strongly agree, one agree and one neutral). One reviewer strongly agreed that the second part of the scenario was realistic, where two were neutral and one disagreed. Half of reviewers (two) strongly agreed that the timeline for the scenario was realistic and the other half (two) disagreed with this statement.

Quantitative Analysis of the Results for the Train Scenario

Of the six reviewers who responded, half (50%) rated the *Train Scenario* as complicated and the other half (50%) rated it as complex. Four reviewers reported their estimation of which factors contributed most to the level of complexity in the *Mail Scenario*. Two chose impact, one chose uncertainty, and one chose vulnerability as contributing the most to complexity.

Nearly all reviewers (four) reported that they agreed that the first part of the scenario was realistic (two strongly agree and two agree), while one was neutral. Two reviewers strongly agreed that the second part of the scenario was realistic and three were neutral. Finally, three reviewers agreed that the timeline for the scenario was realistic (one strongly agree and two agree), while two remained neutral.

3.3.3.4 Summary of findings

Though reviewers found the train derailment scenario to be the most complex according to our rating scales (albeit, not by a large margin), reviewers identified the radiological scenario as most complex when asked during the verbal portion of the assessment process. Notably, prior to completing the rating scales, reviewers most frequently cited the radiological scenario as most complex when asked if the scenario was best described as simple, complicated or complex. After completing the rating scales, reviewers cited the train derailment scenario as the most complex when measured on a scale of not at all complex (0) to very complex (4). Corresponding results between the rating scale means and overall complexity level means indicate some degree of promise in the efficacy of the scales. The conflicting results may be partially explained by the difficulty many have with distinguishing complicated situations from complex (as reflected by the wording of the first question on describing the scenario as simple, complicated or complex). Additionally, these conflicting results may indicate that reviewers are taking in more elements into their decision after reviewing the scales than they did before filling out the rating scale.

The radiological scenario was subsequently chosen because of the number of organizations that would become involved, locally, regionally, federally and internationally. In addition to being highly complex, the scenario chosen also needed to plausibly involve the Canadian Forces; given the security implications of a dirty bomb scenario, and the decontamination knowledge and capabilities in the Canadian forces, it was determined that the radiological scenario best fit the criteria.

Disagreements with respect to the timeline and plausibility of the scenario were reflected in the discussion groups and in the questionnaire response, thus the research team concentrated its efforts on scenario refinement in these areas. Additional attention was also given to making the *Mail Scenario* even more complex.

3.3.4 Rating scale refinement for future research purposes

An extended version of the rating scale, complete with sub-elements, shows promise as a tool for measuring situation complexity. This is indicated by results produced to-date. The rating scales also have the potential to be extended for other uses. With further refinement and testing, these

scales may be used in scenario development for training exercises and as a tool for retrospective case study analyses.

3.4 Instrument development

A set of instruments was developed for the simulation experiment. These instruments were used to measure the dependent variables, to provide background information on the participants, to measure the participants' ability to recall and understand simulation materials, and to measure the quality of decisions made by participants. These instruments are described in more detail below.

3.4.1 Dependent measure instrument development

The dependent measures instrument (see *Annex G*) consists of three parts; the first part includes questions on individual participation and perspectives. The second part is concerned with questions on dynamics within the pods. The third part focuses on questions concerning dynamics between pods. The third portion of the instrument was not included in the closed pod sessions. Questions on these questionnaires are made to be answered on a five point Likert scale, from strongly disagree (0) to strongly agree (4), where participants answer the level to which they agree with the statement.

The questions measure participants' satisfaction with problem solving process, level of participation, task and group cohesion, and level of agreement. Questionnaires were reviewed during initial pre-testing and pilot testing phases. It was discovered that a few of the questions were duplicated on task one and task two questionnaires when they did not require duplication. These questions were taken out of the task two questionnaires where they had been duplicated.

3.4.2 Background questionnaire

Participants were asked to complete a Background Questionnaire (see *Annex H*) during the briefing session of the experiment. The questionnaire was comprised of both open and closed questions. Participants were asked to provide their current job title, the length of time they have worked in their position, with the organization and in emergency management, and to describe their main responsibilities with respect to planning and responding to emergencies. Other socio-demographic information was collected such as their age, gender, language competency and level of education. During the pilot testing, participants were assigned roles and thus filled out the Background Questionnaire as actors. During the senior participant sessions, roles will be assigned based on the participant's current position and background.

3.4.3 Consistency of interpretation instrument

A consistency of interpretation questionnaire (see *Annex L*) was developed to determine the degree to which the participants' interpretation of the scenario matched the information delivered during the session. The score on this questionnaire demonstrates whether the information delivered to the participant was absorbed and retained. It may also reflect the participants' level of participation with respect to engaging with inject materials. The consistency of interpretation instrument was designed to enquire about items of importance to emergency managers. Questions

were specifically developed to ask about items that would be useful and important to carry out the two tasks in the *in vivo* experiment. The questionnaire consists of ten questions and is administered at the end of the session once all of the binders have been collected. It is distributed at this time in order to ensure that participants are answering from memory and not from the binder materials.

3.4.4 Decision quality rating instrument

One key dependent measure is the assessment of decision quality. The decisions developed by pod participants via the coordinating and collaboration tasks were assessed by a small group of raters (n=3) using a guide developed to collect their ratings on dimensions of decision quality based on elements derived from decision analysis theory (Edwards, Miles & von Winterfeldt, 2007), and the Shared-Decision Making Framework. Examples of elements rated include use of correct logic, indication of clear preferences, use of an appropriate frame, appropriate use of resources, and creativity. The rating scale was developed using a 5-point Likert scale to capture raters' judgements on the various elements for each decision (see *Annex N*).

Given the diversity in expression of decisions across pod members and pods, the study team formatted decisions using extractions from the individual worksheets and recordings so that each decision rated was of similar format and had similar levels of detail. Once decisions were compiled, they were randomly sorted for each rater, with the rater remaining blind as to whether the decision had been derived from a collaboration or coordination task. A rating guide was completed by each rater for each decision. All decisions from communication tasks were grouped together for assessment, as were the decisions from the health and safety tasks. Inter-rater reliability was assessed using Fleiss's kappa and intra-class correlation.

3.5 Development and assessment of simulation tasks

The development of the simulation tasks began prior to the scenario assessment process. Draft versions of these tasks were assessed during scenario rating sessions and individual meetings with expert raters. Following the scenario selection process, the radiological scenario was developed for the simulation, and the tasks were further refined to reflect specific issues of concern brought out by this scenario, such as health and safety concerns. This section of the report describes the links between the simulation tasks and the Shared Decision-Making Model, the rationale for assessing simulation tasks, and the task development and refinement process.

3.5.1 The Shared Decision-Making Model as it relates to simulation tasks

The experimental design involves the manipulation of two levels of the independent variable, approach to problem-solving. These levels are coordination and collaboration. These two levels are depicted on the right hand side of the *Model for Inter-Organizational Problem Solving*, which is pictured and described in the introduction section of this report. In order to manipulate the implementation of these problem-solving approaches, two sets of tasks were developed – one set of tasks to elicit coordinating behaviour, and one set of tasks to elicit collaborating behaviour.

In addition to facilitating the manipulation of the approach to problem solving variable, the tasks were also designed to limit the moderating effects of problem solving stage to three stages of the problem solving cycle represented in the figure below. Each task was divided into three sub-tasks, and each of these sub-tasks related directly to one of the following problem-solving stages: problem definition, solution generation, and decision making.

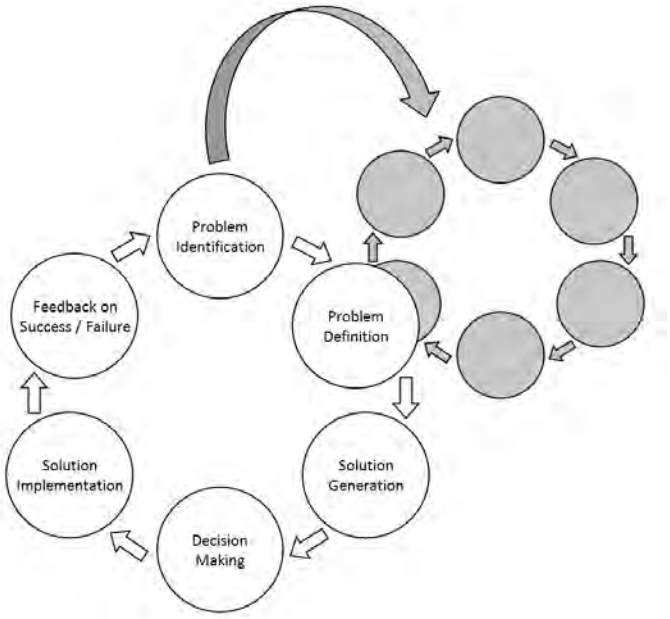

Figure 5: Generic stages of problem-solving

3.5.2 Rationale for assessing simulation tasks

Draft tasks were reviewed by individuals with an expert level of knowledge in the field of emergency management, and who were currently members of organizations involved in emergency response. The assessment of these tasks was completed through meetings and sessions held with these reviewers. In particular, these assessments sought feedback with respect to relevancy in terms of the problem identified in the task. Validation was also necessary in order to ensure that the tasks elicited the desired behaviour (coordinating or collaborating) from the participants. Reviewers agreed that the tasks and task worksheets elicited the desired behaviour. Suggestions were made by the reviewers to modify some issues identified in the tasks.

3.5.3 Task development and refinement process

The final tasks were developed to reflect a number of design considerations. These considerations required that the tasks:

- Elicit the desired behaviour and approach to problem solving (coordinating, collaborating)
- Include three sub-tasks that replicate the three problem solving stages targeted in the experimental design (problem definition, solution generation, and decision making)

- Be completed within 45 minutes to 60 minutes
- Address issues relevant to the participants
- Be plausible within the selected scenario

Initially, both tasks focused on communication issues. Expert reviewers suggested that one task focus on either evacuation or on health and safety issues of responders. Health and safety was later chosen following the selection of the radiological scenario, as this theme is both relevant to study participants and plausible within the scenario.

The communication tasks and the health and safety tasks were structured using task worksheets, which were completed by participants (see *Annex K*). These task worksheets were developed and worded differently to elicit either coordinating behaviour or collaborating behaviour. Task worksheets were also adapted for closed pods in order to reflect the lack of inter-pod communication within these pods.

3.6 Development of multimedia simulation

Following the scenario and task selection and refinement process, the mail scenario was then transformed into a multimedia simulation using video, animation, audio and slide presentation software. The outputs from the multimedia software were augmented by paper-based materials as well, which were included in the participant materials distributed at the start of each session. This section includes the design considerations for the multimedia components, the techniques used to create these components, and finally, a description of the multimedia components used in the *Inter-GAP In Vivo System*.

3.6.1 Design considerations

While the scenario used during the selection and refinement process was designed to be as detailed as possible to ensure that the raters were able to assess complexity, some details were removed in the final multimedia version of the scenario. This was particularly the case with technical aspects of the scenario that could be considered potential areas for debate and contention among participants (e.g., the first responder group to arrive on scene). To ensure that the participants could fully engage in the scenario without debating unnecessary details, the scenario was reviewed and revised to include only those details which potentially would have a direct bearing on the tasks required.

The introduction of situation reports and news reports into the multimedia components served to encourage participants to fully engage with inject materials. It was determined that, by introducing familiar formats of information such as situation reports, news reports and press releases into the simulation materials, participants would become more fully immersed in the scenario.

Social media outputs were also included among the materials that participants received in the final version of the mail scenario. Social media components included a YouTube clip, a series of Facebook posts, as well as a number of Twitter feeds (see *Annex O* for *Pods Participant Workbook Materials*). These injects were used to add complexity to the types and amounts of

information that the participant received. It required participants to sort through the information for relevancy and reliability, much as responders are required to do during extreme events.

3.6.2 Creating the simulation

After undergoing validation by a series of experts in emergency management, as well as by a number of radiological and military experts, the 'dirty bomb' mail scenario was transformed into multimedia components. Video clips were completed using Xtranormal animation software, Adobe Premiere, and stock video footage. Social media feeds and posts were created using Facebook and Twitter, as well as with Adobe Photoshop. The fictional city of *Gapville*, used to situate the scenario, was created using Adobe Illustrator. Individual *Gapville* maps, which were part of the participant materials handed out during the simulation, were also created with the aid of Adobe Photoshop and Adobe Illustrator. Microsoft Word was used to create the Public Health Agency Press Release inject, while PowerPoint was used to create the instructions for the participants that were delivered via NEFSIS video teleconferencing software.

3.6.3 Multimedia components

The multimedia components are described in this section. These components include video clips, the illustrated fictitious city of *Gapville*, paper-based injects, and PowerPoint presentations.

Video Clips

Video clips were created to simulate a report from an emergency operations centre (EOC), to simulate news reports and updates, and to simulate a YouTube rant from a disgruntled member of the public. The audio tracks, watermarks and the ticker tape information running across the bottom of the screen were added to the videos using Adobe Premiere. Some of the clips were augmented with stock video footage that was purchased for a nominal fee through iStockphoto. Video clips were animated using Xtranormal Technology's video software. Voice actors were used to create the voices for animated avatars, which took the place of live actors in the clips. The voice actors were casted from volunteers from the University of Ottawa's theatre program.

Xtranormal's avatars allowed the research team to create a scenario that is both realistic and yet sufficiently removed from reality (in that the characters are animated rather than live actors) to reduce the potential for psychological stress in participants. This software also allowed a high degree of flexibility during the design phase. Its use was both more efficient and more cost-effective when compared with live action video methods. See *Figure 6* below for screenshots from the simulation.

Figure 6: Screenshots from the Inter-GAP In Vivo System scenario injects

Gapville

The mail scenario is situated in the fictional city of *Gapville*, a highly detailed two-dimensional rendering of a Canadian city located on the border to the United States. This training tool was created as part of the Psychosocial Risk Manager (*PRiMer*) training program, funded by the Centre for Security Sciences, CRTI-06-0259TD project. Created for use in learning activities and tabletop exercises, this cityscape illustration contains all the built and social infrastructure of a mid-sized North American city. Additionally, the city of *Gapville* was created to bring psychosocial issues to the forefront of emergency management training exercises, with a diverse range of at-risk populations depicted alongside other populations that require psychosocial consideration. A visual representation of the city of *Gapville* can be seen in *Figure 7*.

Figure 7: Simulated city of Gapville utilized in the Inter-GAP In Vivo System

Paper-based Injects

A press release from the Public Health Agency of Canada, individual maps of *Gapville*, and outputs from simulated Twitter and Facebook posts or feeds were all presented in a paper-based format. These injects were included as part of the package of information given to each participant at the start of the simulation session.

PowerPoint Presentations

A PowerPoint presentation was used to deliver the instructions to participants over the NEFSIS video conferencing system. Given that instructions varied slightly from the open pods to the closed pods, two versions of this presentation were created. The slides used in these presentations can be seen in *Annex P*.

3.7 PODS session roles, responsibilities and materials

This section describes POD session roles, responsibilities and associated materials used by the facilitator, controller, observers and participants during the course of a complete session of the simulation. Many of the specific forms and instruments used in the simulation have been described already in earlier sections of this report and are only referenced here as appropriate. References are made to both electronic media and paper-based materials but only copies of paper-based materials are included in the appendices.

3.7.1 Facilitator role and materials

Facilitator role

The facilitator's role was to oversee the proper conduct of each session of the experiment as per ethics requirements. The facilitator held a briefing session prior to the experiment followed by a debriefing session at the end of the simulation. The facilitator provided participants with the study's agenda, as well as directions on how to complete the tasks. An explanation of the study's purpose and background was explained in more detail following the completion of the study. The facilitator ensured that all forms and materials were properly administered, completed and collected throughout the day.

Briefing materials

The following briefing materials were used during the briefing session prior to the start of the experiment:

- Information Sheet & Consent Form (Refer to *Annex O* & *F*)
- Confidentiality and Intellectual Property Agreement (Refer to *Annex I*)
- Participant Background Questionnaire (Refer to *Annex H*)
- A short introductory presentation, welcoming participants, explaining their role and communication options within the pods (Refer to *Annex P.1* for presentation slide deck.)

The briefing session lasted about half an hour prior to study commencement. Participants were invited to fill out consent and confidentiality forms as per ethics requirements. They were informed of their voluntary participation as well as anonymity procedures. Each participant also filled out a Participant Background Questionnaire. Briefing participants on the schedule and directions for the experiment allowed for questions and concerns to be addressed by the facilitator. This ensured transparency of participant roles and responsibilities expected during the experiment.

Upon completion of the briefing, participants were assigned to a POD and taken to separate rooms. When in the separate rooms, each participant received a binder with more background information about the experiment and their role. In line with anonymity and confidentially ethics guidelines, participants were assigned a number when given their participant workbook. Participants were then instructed to identify themselves on video by the number assigned them for tracking purposes. A hardcopy of the Gapville map was provided to each POD member with a Gapville profile and demographics table inserted into their participant workbook. The complete contents and structure of the participant workbook are described below in *Section 3.7.4 Participant Materials.* A short video depicting the Gapville profile and its background information was sent to each pod via video conferencing software (refer to *Section 3.6 Development of Multimedia Simulation* for more information about the multimedia components of the simulation).

Debriefing materials

The following materials were used during the debriefing session:

- Consistency of Interpretation Instrument (Refer to *Annex L*)

- Two video clips - an overview of the Model of inter-organizational problem solving and a summary of the research objectives and experimental design.

The debriefing session lasted half an hour. Participants were asked to complete the Consistency of Interpretation instrument. The facilitator then showed participants the two video clips. Participants provided feedback and were able to ask questions regarding the study. The facilitator ensured that all forms and binders were handed in.

3.7.2 Controller role and materials

Controller role

The controller was responsible for running the video conferencing software and guiding the participants as the scenario unfolded. The controller warned participants of time limits on tasks, informed them when communication between PODS was open or closed and directed them to the Nefsis chat function and CB radios.

Simulation delivery script

The controller referred to a script (see *Annex P.2*) outlining the duties and procedures for delivering the simulation. These duties related to technical issues (e.g., plugging in headsets, recording, audio adjustments, etc.), sequencing media delivery (e.g., scenario videos, power point slides, etc.), layout (i.e. the way participants viewed themselves in the conferencing software and the size of the slideshow and video feeds), and voice over script for time warnings and instructions. Included in this script was a breakdown of activities, including the time and slide that belonged with them.

3.7.3 Observer role and materials

During each pilot session, a number of observers were present. The observer's role was created to oversee the distribution and collection of participant materials and forms, as well as to ensure the linking of participants' identification numbers with the written materials, forms, and audio and video recordings from the in vivo sessions.

Prior to the start of each session, questionnaires and worksheets included in the participant binders were labelled with participant ID numbers using "sticky labels". During the initial briefing, as participants handed in their consent forms, they received a binder of participant information and questionnaires labelled with their participant ID number. Four loose identifier labels located at the front of the binder were removed as each participant received their binder, which were then affixed to the corresponding forms for that participant. In order to identify participants with the audio and video recordings, participants were asked to address both the video camera and the web camera and state their name, organization, and participant ID number prior to the start of each session. These statements were made following the briefing session, once participants had settled into their separate pod rooms, but prior to the start of the simulation

3.7.3.1 Observation forms

During each session, a number of forms were completed by the observers to track administrative information and observations about each session, pod and participant. The three forms developed and implemented were:

- Session Administration Information Form
- Participant Identification and Information Linking Form
- Technical and Process Issues Form

Session Administration Information Form

This form was completed for each session (one form per session). Once the briefing session had been completed and the simulation was underway, an observer was tasked with capturing any information that could not be completed prior to the start of the session (e.g., number of participants present, number of pods, etc.). It was used to record basic information about the session, including: date, session number, session type (university students, professional students, or senior officials), task type (collaboration or coordination), pod status (connected or closed), number of participants per pod, pod type (mixed or homogeneous), scenario used, location, the observer's initials, the facilitator, the start time and end time of the session, as well as the total runtime for the session. This form was then used to link the data for these variables to each participant record in the SPSS database, where appropriate. (Please see *Annex P.3* for a copy of the Session Administration Information Form.)

Participant Identification and Information Linking Form

This form was completed for each participant (one form per participant). Once the briefing session had been completed and the simulation was underway, an observer was provided with the completed participant consent forms collected during the briefing phase, and was tasked with completing the relevant participant form (matched according to labels on the Consent Form, the Confidentiality and Intellectual Property Agreement Form, the Background Questionnaire, as well as the Participant Identification and Information Linking Form). The Participant Identification and Information Linking Form was designed to capture the following participant information: participant's name, the four digit participant ID, the session number, session type (University of Ottawa students, professional students or senior officials), the participant's pod number, the participant's number within the pod, the participant's organization, the participant's organization type (military, ICS oriented, and non-ICS oriented), the participant's pod status (connected or closed), as well as the number of participants in the pod. (Please see *Annex J* for a copy of the *Participant Identification and Linking Form*.)

Technical and Process Issues Form

This form was completed for each session (one form per session). Observation forms were used during the sessions to record any technical or process issues that had the potential to affect the data quality of the session. The technical issues form consisted of questions regarding the presence of audio or video delivery problems, audio or video recording problems, inter-pod communication problems due to technology, conferencing software problems, internet connection failures, and a section for other unanticipated technical issues. The process issues form was

concerned with the following problems: participant absenteeism, participant lateness, participants leaving early, consent refusal, delayed start time, session interruption, participant confusion, and other unanticipated process issues. In both the technical issues form and the process issues form, there were prompts to describe the nature of the problem(s) in more detail. (Please see *Annex P.4* for a copy of the *Technical and Process Issues Form*.)

3.7.4 Participant materials

Participant workbooks were prepared for use by participants for each of the four types of sessions conducted. Tasks, questionnaires and worksheets provided to participants varied slightly depending on the task type (coordination or collaboration) and the pod status (open or closed). Below are the four types of participant materials:

1. Open / Coordination

2. Open / Collaboration

3. Closed / Coordination

4. Closed / Collaboration

Refer to *Section 3.5* for a detailed description of the types of tasks. *Annex G* provides examples of the questionnaires differentiated by task type and pod status. *Annex K* provides examples of the task worksheets differentiated by task type and pod status.

The briefing materials contained in the workbooks are similar across all four types of sessions. Also similar across all four types of sessions are the hard copy versions of the situation reports and associated press releases and social media feeds. A debriefing sheet was provided containing the contact information of the research team should participants have any questions about the simulation at a later date. The sequence of material found within each participant workbook is listed below.

- Gapville Profile
- Situation Report #1+ Public Health Agency of Gapville Press Release Inject *
- Task 1 + Task 1 Questionnaire *
- Situation Report #2 + Facebook Post Inject + Twitter Feeds Inject *
- Task 2 + Task 2 Questionnaire*
- Debriefing Page

Materials marked with an asterisk were put into separate envelopes within each participant binder and opened as per simulation procedure. *Annex O* contains an example of only similar materials across all session types. *Annex K* contains the different task types and *Annex G* the different types of task questionnaires.

3.7.5 Technical and logistical support

On the day of each session, a technician was responsible for setting up each room as per section 3.9 of this report. The technician ensured that the POD rooms and the control room were properly set up and that the video conferencing software was functioning properly and accessible. This person was on hand throughout each session to monitor in case any problems occurred. Logistical support included arranging refreshments for participants and making sure appropriate signage was put up to direct participants to the study.

3.8 Recruitment

Recruitment efforts centred on finding three types of participants: experts for scenario and task assessment as well as for decision quality rating; naïve participants and junior professionals for pilot testing; and senior level emergency management professionals for the full scale experiment. Participant involvement in the study was completely voluntary and consent was obtained from each participant as per ethics requirements.

Recruitment of Experts

Experts were needed for the assessment of the tasks and scenarios, for the senior level re-review session, and for the decision quality rating session. Nine experts were recruited for the scenario and task assessments. These experts provided valuable feedback on the accuracy, plausibility and complexity levels of the scenarios drafted for the scenario selection process. Expert participants were required to be willing to participate in the study, able to participate in English, and able to attend scheduled meetings or sessions. An expert level of knowledge of emergency management and response to extreme events was also required. See the table below for specific inclusion and exclusion criteria for this group.

Table 5: Inclusion and Exclusion Criteria for Expert Recruitment

Inclusion and Exclusion Criteria	Scenario and Task Assessments	Senior Level Demo	Decision Quality Rating
Expert knowledge of emergency management and response to extreme events	✓	✓	✓
Able and willing to volunteer to participate in the study	✓	✓	✓
Able and willing to participate in English	✓	✓	✓
Outside commuting distance of the study site		✓	✓
Member of an organization involved with emergency response or management	✓		✓
Has been in management-level decision making role for his/her organization for at least 12 months (or has was in a management-level decision making role for his/her organization for at least 12 months prior to occupying a new position or prior to retirement)		✓	

Recruitment for Pre-testing and Pilot Sessions

Naïve participants were required for the pre-testing and pilot testing sessions. Students and naïve participant volunteers provided valuable feedback related to the content and process of the simulation. Junior level career professionals and students engaged in emergency management programs, the military and non-governmental organizations were targeted for the junior level pilot sessions. These sessions provided valuable feedback on the instruments used in the experiment, on session materials and on the development of coding schemes. Inclusion and exclusion criteria for this groups of participants is shown below.

Table 6: Inclusion and Exclusion Criteria for Pre-testing and Pilot Sessions

Inclusion and Exclusion Criteria	Internal Pre-testing Sessions	Naïve Participant Pilot Sessions	Professional Students/ Junior Career Sessions
Able and willing to volunteer to participate in the study	✓	✓	✓
Able and willing to participate in English	✓	✓	✓
Outside commuting distance of the study site	✓	✓	✓
Student, volunteer or team member	✓		
University student or volunteer naïve to the purpose of the study		✓	
A student in a professional emergency management program or a junior level member of an organization involved with emergency response (a member a military, ICS, or a relevant non-governmental organization)			✓

The research team used a University of Ottawa study recruitment program, called the *Psychology Integrated System of Participation in Research (ISPR),* to recruit naïve participants during the pilot testing phase. The present study was posted on this system and time slots were made available to first year psychology students. Refer to *Annex Q.1* for a screenshot of the posting made on the ISPR system. The research team was notified by email when a student signed up for a time slot. Students remained anonymous and only an identification number was provided. Upon completion of the study, the research assistant entered the ISPR system and awarded the student their participation credits.

During the pilot testing phase, naïve participants were assigned fictitious roles within the scenario, as preliminary testing indicated that the limited knowledge that these participants possessed of emergency management prevented the participants from fully engaging in the scenario. Roles assigned to these participants included:

- Head of the Red Cross (National)
- *Gapville* Fire Department Chief (Local)
- Colonel of the Reframe Military (Federal)
- Mayor of *Gapville* (Local)
- Head of Public Health Agency (Federal)
- Anticipate Regional Transport Authority (Provincial)
- RCMP Lead Investigator (Federal)
- Chief of the *Gapville* Police (Local)
- Director of the McLaughlin Memorial Hospital (Local)
- Head of Public Safety (Federal)

Recruitment for Full Sessions

Forty-eight senior level decision makers are targeted for the four full sessions scheduled to occur over April and May of this year. These senior level decision makers will be members of ICS, non-ICS and military organizations. See *Table 7* for a summary of the participants required to complete the PODS experiment.

Table 7: Summary of Participants Required to Complete the PODS Experiment

Phase of Session	# Military	# ICS	# Non-ICS	# Total
Full Sessions (3 pods plus mixed closed/ substitute pod)	4	4	4	12
	4	4	4	12
	4	4	4	12
	4	4	4	12
# Total	16	16	16	48

Full sessions will require participants with a minimum of one year experience in a management role in response to extreme events, previous experience with at least one extreme event, and decision making authority within their respective organization. Inclusion and exclusion criteria for full session recruitment sessions are shown below.

Table 8: Inclusion and Exclusion Criteria for Full Sessions

Inclusion and Exclusion Criteria	Full Sessions
Previous experience in both strategic and operational decision-making during at least one major event	✓
Has been in management-level decision making role for his/her organization for at least 12 months (or has was in a management-level decision making role for his/her organization for at least 12 months prior to occupying a new position or prior to retirement)	✓
Has the authority (or has had the authority in the past) to make decisions regarding allocation of resources on behalf of their organization with respect to major events.	✓
Able and willing to volunteer to participate in the study	✓
Able and willing to participate in English	✓
Outside commuting distance of the study site	✓

3.8.1 Communication Process

In order to organize the various participants required for completion of the experiment, steps were outlined for the recruitment process and communication documents were drafted. A formal process was developed for the recruitment of participants who were not solicited through the University of Ottawa's ISPR system. Expert raters contacted during the scenario and task assessment phases and those who will be contacted for the decision quality rating phase of the project may be completed via telephone as participant availability permits. The formal recruitment protocol for the remainder of the participants in the PODS project is as follows:

- *Step 1: Review existing database of contacts*

  Existing contacts were reviewed and participants were selected that were likely to meet the inclusion criteria.

- *Step 2: Request additional contacts*

  Additional contacts were requested from experts consulted during the scenario and task assessment processes. Senior officials at the Canadian Forces were also contacted via e-mail in order to gain assistance with recruiting military personnel.

- *Step 3: Invite participants*

  Participants were invited via e-mail to take part in the simulations. In some instances, participants were contacted by phone first. An invitation letter was drafted both for organizations and for individuals (see *Annex E* & *Q.2*).

- *Step 4: Confirm that interested participants meet inclusion criteria and determine availability*

  Phone confirmation was used to find out if interested participants met inclusion criteria, and to determine participant availability. A phone script was used during the confirmation process (see *Annex Q.3*). Follow-up occurred by phone or e-mail as required.

- *Step 5: E-mail reminder*

  Participants were sent an e-mail reminder (see *Annex Q.4*) prior to the session dates. A brief letter was written which included the time, location, date, directions, parking information and contact information. Participants were asked to contact the research team should they need to cancel.

- *Step 6: Send a thank you letter*

  Thank you letters were sent to session participants within one week of the completion of each session. These thank you letters, sent via e-mail, thanked participants for their contribution to the project (see *Annex Q.5 & Q.6* for copies of these letters).

3.9 Equipment, facilities, software, data collection and storage

This section provides a summary of the equipment, facilities and software choices made for the in vivo simulation exercise. (Refer to *Annex R* for a complete equipment and room requirements listing.) Preliminary equipment, facilities and software needs were documented in the experimental plan developed under *Task 2*. However, as the hardware and facilities testing took place before and during the participant pilot tests, these requirements were modified.

The section begins with a discussion on the use of video conferencing software for the experiment before describing the type, extent and outcomes of the technical testing conducted prior to the start of the formal experimental sessions with senior decision-makers. Please note that *Section 3.10 Pilot Testing* also contains summary comments related to technical and process issues encountered during the participant pilot sessions. These comments were documented by assigned observers for each of the pilot sessions and are not repeated here. The section ends with a brief description of the final hardware requirements and room configurations for the experiment and electronic data collection and storage protocols.

3.9.1 Rationale for use of conference software

The *in vivo* experiment required a system for delivering simulated data simultaneously to a variable number of pods. It also required an efficient method of data capture for text, video and audio. This was particularly important given the amount of data to be collected over the course of the experiment and the multiple levels of analyses to be performed.

Commercially available video conferencing software proved to be an ideal solution to meeting these needs. It offered a robust study environment where the sessions could be served locally (i.e., to designated meeting rooms or working areas) or remotely, to participants joining in from homes and other places of work. It offered different propriety systems of data collection, including video and chat recording. With online video conferencing software, participants can see and communicate with members of other pods. Although body language and expression can be very subtle, it is a powerful means of communication and understanding. The opportunity to review and analyze such data will inform the findings of the experiment. Also, it proved to be less expensive to run the sessions through the internet (be it locally or remotely) than it would be to hard line all the necessary equipment required to implement the same experiment with more traditional technologies.

Implementing an online video conferencing solution made it possible to create a functioning Hydra inspired system of disseminating and collecting data within a reasonably limited budget. It was also hoped that by using online software the experiment could be run remotely, if necessary.

3.9.2 Software selection process

A number of online video conferencing software systems were considered for the experiment, including NEFSIS, GoToMeeting, NetMeeting, Adobe Connect, DimDim and WebEx. While there was overlap in terms of benefits and features for each of the systems reviewed, the NEFSIS system came closest to meeting our overall requirements. These benefits and features included:

- *Ease of use for participants*

  It was important that participants be able to easily and comfortably communicate between pods. NEFSIS offered both an intuitive and customisable interface.

- *Ability to record meeting sessions*

  Of the platforms explored, NEFSIS was the only one offering video recording of meetings as a function. With this function, sessions can be recorded with full audio and video. This was an important factor in choosing a meeting platform, as it facilitated the data collection process for multiple media types.

- *Ability to capture chat messaging*

  Most of the platforms reviewed offered methods of saving chat messages. However, NEFSIS and Goto Meeting were the only two that offered simple one click solutions. NEFSIS provides a chat window allowing participants to communicate in a free bi-directional manner. It enables the saving of all chat files as '.txt' files. This means that all chat messaging done during the sessions can be captured for later review and content analysis.

- *Security*

  Due to ethical considerations, meetings held as part of the experiment had to be held securely. Additionally, certain materials needed to be held back from participant until it was time to deliver them as scenario injects. These materials remained hidden until they were delivered according to a pre-determined schedule. NEFSIS facilitated these needs through strict user access controls. Administrator privileges can only be given through a confidential login or directly from another administrator, meaning that participants would be unable to access any information they are not given. Additionally, these system controls ensure that the system remains secure from individuals who are not invited to participate in the meetings.

- *Ability to deliver information in multiple forms*

  NEFSIS allows for multiple forms of information sharing and exchanging. Among the options are screen, application and multimedia file sharing. For the purposes of the *in vivo* experiment, NEFSIS injects were delivered exclusively via PowerPoint or multimedia video. The simulation included simulated video news reports as well as instructions delivered with on screen PowerPoint slides.

- *Ability to deliver smooth audio/video files*

  The use of different types of media during the simulation created the potential for long pauses and poor transitions from one simulation segment to another. To limit visual and audio distractions and keep participants engaged, videos needed to be smooth and free of pauses and glitches. NEFSIS was able to accommodate this requirement.

3.9.3 Technical testing of equipment, facilities, and simulation delivery system

3.9.3.1 Technical testing and equipment and facilities re-configuration

Technical tests were done on specific equipment and software throughout the fall, prior to the first pilot test with participants. The purpose of these tests was to ensure the proper functioning and set-up of the individual equipment / software components of the simulation system. In addition to these technical tests, three technical run-throughs of the experiment were conducted under "full load" conditions. For these tests, all required hardware and rooms were set-up and the complete simulation delivered by video conferencing software. Several of the tests involved practice delivery and reception of the simulation from remote locations.

The nine pilot tests with participants also offered additional opportunities to debug hardware/software issues and modify equipment settings and location for optimal performance. Most of the pilot tests were conducted under "steady-state' conditions, i.e., after all equipment and location choices were finalized, as well as simulation content, sequence and processes.

The initial concept for the simulation exercise was based on the best practices of several different systems used across Canada, and worldwide in operational training exercises. The simulation system developed at GAP-Santé, now known as the *Inter-GAP Simulation System* was intended for deployment at an external off-campus location with potential delivery to various selected sites across the country. It was anticipated that this would help facilitate recruitment of senior decision makers who are geographically dispersed across Canada. It would increase the availability of participants and reduce travel time and associated expenses. In order to create this set up, the *Inter-GAP System* required 18 laptops. Each participant in a session was to have their own laptop, pre-loaded, for a possible 12 computers needed for participants. In addition two laptops are needed for the controllers (one for open pod delivery and one for closed pod delivery) and four laptops are needed for observers. Routers and switchers were also obtained for splitting internet connections at an unknown or remote location. Printers were also purchased for document sharing or inject delivery.

Upon initial testing it became apparent that wireless internet connections would not have sufficient bandwidth to deliver the media rich injects provided in the scenario. It also became apparent that a technician would need to be on stand-by at any remote location in order to help the user download the software, adjust their speakers and microphones, and ensure they were on camera, and able to hear and see properly. This negated the feasibility of having pods in remote locations.

It was decided then to locate the experiment entirely at University of Ottawa facilities. During the technical run-throughs for a single pod using University of Ottawa student volunteers, it was

noted that immediately after a simulation inject was delivered, participants moved away from their computer screens (and web cams) to sit at a table together. In an attempt to accommodate this demonstrated behaviour, and to have a more realistic experience for the participant, each room was re-configured with only one computer and a large monitor. All three participants in a pod now shared the same work table and viewed the same monitor. The use of a single computer per room was also supported by the fact that most meeting rooms are configured at the University for only one internet connection. The set-up of multiple connections per room posed logistical and security implementation problems. With all the pods in close proximity to one another, the research team also decided to introduce the use of two-way radios (one per room) as an alternative communication vehicle between pods to add realism to the simulation.

3.9.3.2 Technical testing of simulation system – summary of solutions

As alluded to above, the overall configuration of the pods evolved over time as the simulation system was tested in different circumstances and environments. In testing the simulation system, there were two main technical issues to refine. They were:

Audio/video quality:

Each meeting room required clear audio and video communication between the pods and with the control room. Without clear audio, pods would not be able to work together easily, and without clear audio to the control room, data recordings could not be reviewed easily for analysis. In early technical run-throughs, it was determined that while the video quality of the cameras was sufficient, the audio was less than satisfactory. In these early sessions the audio microphone was integrated into the web camera. Unfortunately, these camera microphones created significant feedback issues when used in conjunction with the video camera, computer speakers and MP3 voice recorders. This issue was later solved when USB conferencing speaker/microphones were utilised. The new microphone/speakers featured integrated technology to cancel out feedback created from other sources.

Internet connection quality:

PODS sessions were run with both the control room and pods on and off campus. The system was also tested to compare its wireless performance to hard-wired performance.

When the experiment was run with computers on a wireless connection, there was a noticeable lag in communication between pods and delivery of injects from the control room. Some participants also lost their wireless connections and were occasionally ejected from the session.

The session configuration was also tested remotely using traditional hard line internet connections from various locations throughout Ottawa. Meetings run in this fashion worked, however video injects sent via the control room buffered more slowly and their display was considered to look somewhat choppy.

3.9.4 Equipment and facilities requirements and set-up

The following section reflects the specific equipment and set-up required to run the *Inter-GAP Simulation System*. For an in depth description of the required equipment and set-up, see *Annex R*.

Control Room

The control room houses two computers each with a dedicated internet connection. One computer is used for running the open pods and one computer is used for running the closed pods. Each computer must be connected to a different NEFSIS meeting room and have a microphone/earphone headset. These computers both need to be pre-loaded with the videos and power point presentation needed to complete the sessions. During each session the meeting video and bi-directional chat is recorded, collected, and later stored in a secure location. Extra seating is also available for observers.

PODS Rooms

Each pod requires a hard-lined internet connection. Rooms must also be sufficiently large enough to contain all the pod equipment and the three participants. Additionally, there must be sufficient room such that a video camera can be placed far enough away from the participants to capture all of them in the camera frame. See *Figure 8* for a typical pods configuration.

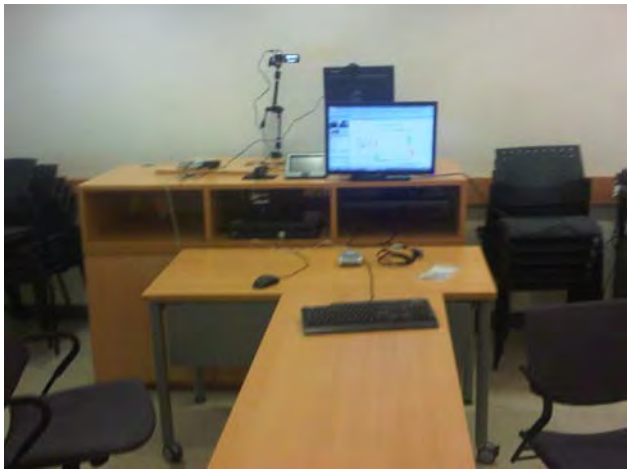

Figure 8: A typical POD room configuration.

Open pods are set up with one computer in each room. A web camera, and a microphone/speaker speaker unit are connected to each of these computers. The computers are connected to the NEFSIS meeting room prior to the start of the session. Additionally, a video camera is set up behind each computer to capture and record all the events within the room. These rooms are also equipped with a two-way radio and a voice recorder.

Closed pods are isolated from the other pods. Consequently, they do not require a microphone or web cam. Instead closed pods are set up with one computer, one voice recorder, and one video camera only.

Brief/Debrief Rooms

Brief and debrief rooms need to be large enough to comfortably fit up to 18 people. These rooms should also have live power outlets to run a computer and multimedia projector.

3.9.5 NEFSIS set-up and administration

NEFSIS meetings were initiated by logging on to the appropriate meeting through an assigned web address. After entering the meeting room, administrators adjusted the privileges for each pod, such that participants were not able take over use of the screen, nor were participants able to present materials. The administrator also configured the audio and video settings, and pre-loaded all scenario inject materials. Finally, administrators initiated the recording function prior to the start of each meeting.

3.9.6 Data collection and storage

After the completion of each PODS session, all of the digital recording files were collected. These files included: meeting chat files, NEFSIS video recordings, video camera recordings and digital voice recordings. All files were then uploaded to an encrypted external hard drive. Materials were named using the session date, media type, and pod number. A backup of all materials was also made on a second external hard drive, which was also stored in secure location. During the analysis phase of the project, materials will be uploaded to a secure password protected folder on the network drive for the research unit.

3.10 Pilot testing

3.10.1 Overview of the pilot testing

Pilot testing consisted of having various senior managers' help with the selection and rating of potential scenarios. This was followed by internal pilot testing, pilot testing with naive participants, and pilot testing with professional student/early career participants. Pilot testing concluded with a senior level demonstration and review (see *Figure 9*). Pilot testing consisted of ten sessions, which began in November of 2010 and was completed in March of 2011. These sessions varied by type (coordination and collaboration, open and closed), number of participants and number of pods (see *Table 9*).

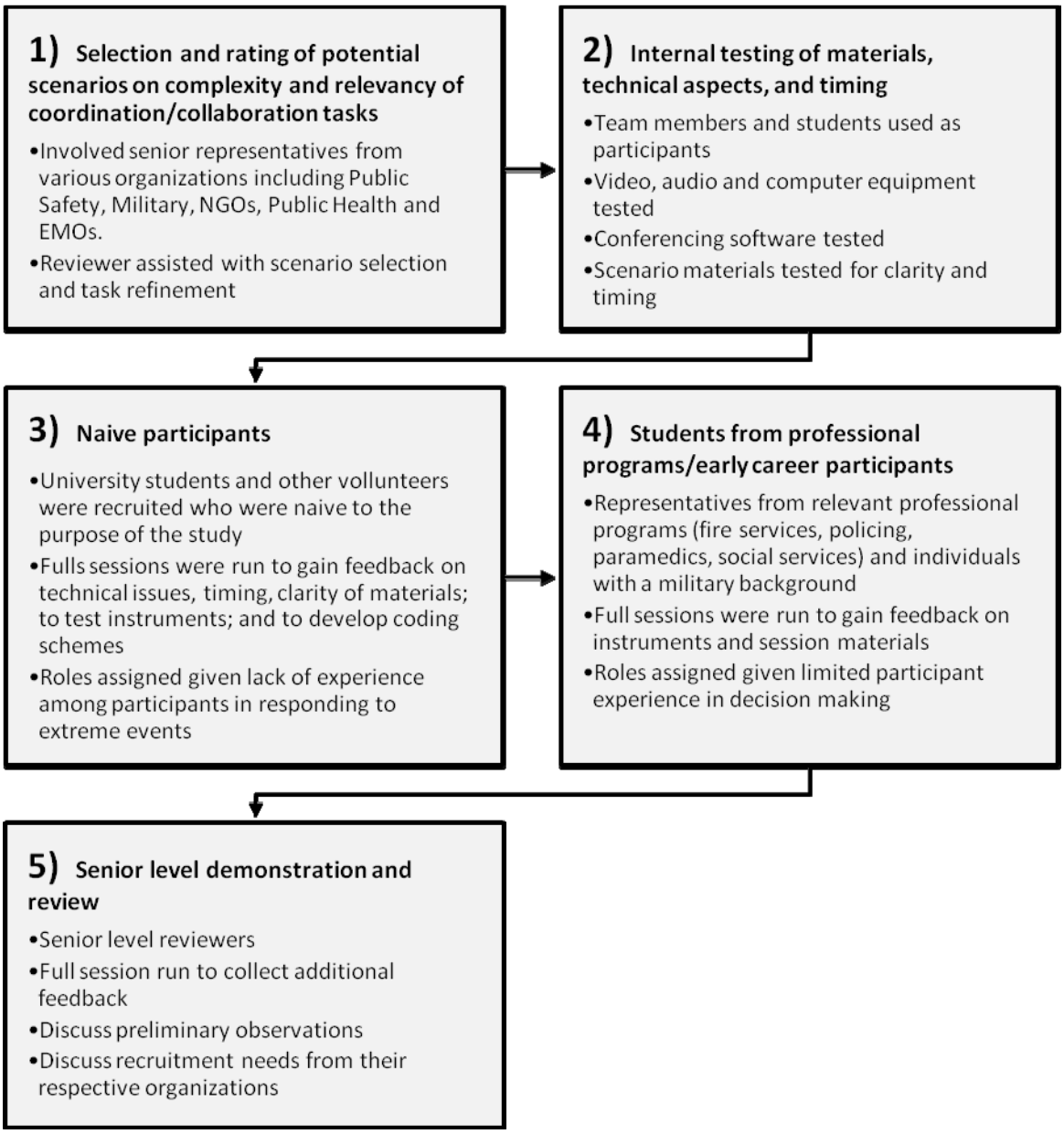

Figure 9: Review and Pretesting Stages

Table 9: Overview of the Pilot Tests

Session #	Participant Group	Date	Type		Number of participants	Number of PODS
Session 01	Uottawa students	Tues-Nov 30	Collaboration	Closed	3	1
Session 02	Uottawa students	Wed-Dec 1	Collaboration	Open	9	3
Session 03	Uottawa students	Thurs-Dec 2	Collaboration	Open	9	3
Session 04	Uottawa students	Fri - Jan 21	Coordination	Open	4	2
Session 05	Uottawa students	Mon - Jan 24	Collaboration	Open	5	2
Session 06	Professional program	Fri- Jan 28	Coordination	Open	5	2
Session 07	Professional program	Thurs-Feb 3	Collaboration	Open	8	3
Session 08	Professional program	Thurs- Feb 24	Coordination	Open	10	3
Session 09	Professional program	Fri- Feb 25	Collaboration	Open	10	3
Session 10	Senior officials "demo"	Fri - March 18th	Collaboration	Open	TBD	TBD

3.10.2 Pilot testing results

The following section presents the preliminary results of the pilot testing phase of the PODS project. Topics addressed include the content and process results of the pre-testing and pilot testing phases, the results from the senior demonstration session, and the preliminary quantitative results of the selected pilot testing sessions.

3.10.2.1 Content and process

Pilot testing sessions yielded important information concerning required content and process changes in the *in-vivo* simulation experiment.

Content

The PODS project simulation materials were based upon training exercises used before the Vancouver Winter Olympic Games. Those materials were delivered in the form of a live action news broadcast, with field reporters. Using the radiological event scenario, the simulation materials in the PODS project uses digital avatars to deliver news broadcasts with field reports. Due to the stringent selection, and intensive subject-matter expert reviews during the script-writing phase of the scenario, there were very few changes to be made to the final media output. Feedback from participants in the technical run-throughs and pilot sessions were universally positive with regards to the media delivery. The most significant change made was the addition of a new section, presented as a "live video conference" from the Emergency Operations Centre in *Gapville,* delivered by the Director of Emergency Management. This device allowed for further dissemination of pertinent information. To better accommodate the time restraints of the session, a second edit was made of the materials, and the final output was shortened by approximately 2 minutes. The paper-based materials in the participant binders reflected the changes made to the scripts. A situation report in a government standard template, listing the major plot points was provided for ease of reference.

Process

The original PODS project process began with participants filling out various forms including the consent form. These were immediately collected by the team members. A morning briefing followed which introduces participants to the *in-vivo* experiment. After the briefing, participants were taken to their respective rooms (or pods) by team members; in these rooms participants were given their binders which contain envelopes with specific tasks and questionnaires. Participants watched the simulation and were prompted visually to open different envelopes to discover informational materials, tasks, and questionnaires for task one and task two. A 20 minute break was provided to participants between the two tasks. Once task two was completed, participants gathered in the original briefing room and were debriefed. Participants' feedback was recorded and considered along with team observer reports on the technical and process issues form (see *Annex P.4*).

Major changes to the original process included:

- Collecting participant consent forms and other initial forms once participants have been brought to their respective rooms.
- The addition of labeling to participant materials to ensure ethical standards of confidentiality and ensure proper linking of information.
- Inter-pod communication methods were changed, so that participants are only able to communicate through CB radios or the chat function for the first 20 minutes. Once the 20 minutes are over, participants are able to communicate via video conference for the remainder of the task.
- Screen layout changes were made to the technical process, and made a difference concerning how videos and information slides were to be presented.

The number of process and content problems decreased considerably from one session to the next. Technical and process improvements were incorporated as opportunities arose. The end result was an engaging, efficiently delivered simulation exercise that reflected a high professional standard.

4 Next steps: Running the In Vivo simulation

4.1.1 Scheduled sessions

A total of four additional sessions will be completed with senior officials. These sessions will be held on April 6th 2011, April 13th 2011, May 5th 2011, and May 11th 2011.Two of these sessions will have coordinative tasks, while the other two will have collaborative tasks. Also, two of the sessions will have mixed pods, while the other two sessions will have homogenous pods. The mix of pods and type of tasks has yet to be assigned to the specific dates.

4.1.2 Data collection methods and planned analysis

4.1.2.1 Component 1 – Qualitative interviews with decision makers

Data collection

Additional complementary interviews will be scheduled according to the participants' availability. They will also be audio recorded, and will take place in a convenient location for the participant (e.g. her /his office). These interviews will take place in the National Capital region. Once the interviews are completed, the audio files will be secured at the Gap Santé facilities at the University of Ottawa.

Data Transcription

Each interview will have to be transcribed completely in order to process the information with qualitative analysis software that will classify, sort out and range the data previously imported, to find trends and patterns that can be analysed.

Data Analysis

The first step to analyse the information transcribed, will be to detect elements related to situational complexity (simple, complicated or complex). Each section will contain key pieces of data. These pieces will become the themes to develop the analysis to validate the inter-organizational problem solving model and to identify themes that could potentially inform the framework.

In order to accomplish this, data will be categorized into few topics. Then each category will be expanded depending on the level of specificity required to sustain each analysis. The reliability of the proposed coding scheme will be assessed by comparing the 10% of the coding results of the interviews, by two different researchers. The goal is to reach a consensus in the results, but if this does not occur, iteration in the process for the elements under discussion is done, until the results concur.

4.1.2.2 Component 2 – In vivo simulation experiment

Data Collection

The data collected will include both self-report data collected from individual participants after each task (See *Annex G* for the participant task questionnaires), and observational data collected during the sessions via audio/video recording. The experiment will generate at least seven and a half hours of audio visual materials per session, from approximately two and a half hours of pod interactions at the different cameras located in various rooms (please refer to *Section 3.9.4* for details).

Data Cleaning and set up

All data will be set up for analysis by checking its quality and neatness. Data from the participants' questionnaires will be captured in a digital statistical database, while protecting the anonymity of participants with the use of identifiers (please refer to *Section 3.2.2* for details).

The data from the audio and video recordings will also be quality checked and then correlated with the participant's identifiers. Both the video and audio recordings will be processed by applying picture filters to blur faces. Afterwards, both audio and video data will be transcribed. This will require a considerable effort due to the length of the recordings and the complexity of the participants' interactions.

Data Analysis

The data will be coded and cleaned. Descriptive statistics will be run for each dependent variable to evaluate data characteristics such as outliers, normality, linearity, variance homogeneity and frequencies.

Due to the study's experimental design, it is expected to apply variance and covariance analyses such as ANOVA, ANCOVA, MANOVA, and MANCOVA. These analyses will allow testing the main effects of the two independent variables (approach to multi-organizational decision-making and multi-organizational environments), and their interactions. Based on the results from the variance and covariance analysis, further comparison and contrast tests would be required to allow for complementary interpretation of the main effects and its interactions. Also based on correlation analysis, the relationship between some dependent variables can be further understood.

4.1.3 Modelling communication and decision making functions

The goal for Task 4, given the results of the laboratory findings, is to develop a model of the emergency management decision functions and the communications functions to support the decision function. The model of these functions must describe limitations and variations based upon situational factors described in the case studies. These situational factors must include circumstances where there is the potential for failure (e.g., the failure of the communications infrastructure during Hurricane Katrina). The functions must also be related to the SDM and ICS frameworks as well as activities described as elements of capabilities within the National Incident Management System (NIMS).

References

Alison, L. & Crego, J. (2008). *Policing critical incidents: Leadership and critical incident management*. Portland, OR: Willan Publishing.

Canadian Institutes of Health Research, Natural Sciences and Engineering Research Council of Canada, and Social Sciences and Humanities Research Council of Canada. (2008). *Tri-Council Policy Statement: Ethics Conduct for Research Involving Humans*.

Crotty, M. (1998). *The foundations of social research*. London: SAGE.

Edwards, W., Miles Jr., R.F., & von Winterfeldt, D. (2007). *Advances in Decision Analysis: From Foundations to Applications*. Cambridge, UK: Cambridge University Press.

Klein, G. A., Calderwood, R. & MacGregor, D. (1989). Critical Decision Method for eliciting knowledge, *IEEE Transactions on Systems, Man and Cybernetics*, 19, 462 -472.

Lemyre, L., Boutette, P, Pinsent, C., Corneil, W., Johnson, C, Munoz, M., Lemieux, V., Lalande-Markon, M.P., Gibson, S., Riding, J., Lemus, C., Blust, S., and Dennie-Filion, E. (2009). *Research Using In Vivo Simulation of Meta-Organizational Shared Decision Making (SDM): Task 1: Synthesis of Case Studies to form a SDM framework*. Report for DRDC Canada.

Lemyre, L., Boutette, P, Pinsent, C., Corneil, W., Johnson, C, Lalande-Markon, M.P., Gibson, S., Riding, J., Lemus, C., Blust, S., and Dennie-Filion, E. (2010). *Research Using In Vivo Simulation of Meta-Organizational Shared Decision Making (SDM): Task 2: Development of an experimental plan for in vivo exercise and simulation*. Report for DRDC Canada.

Lindlof, T. R. and Taylor, B. C., (2002) *Qualitative Communication Research Methods* (second Ed.), Sage Publications, Thousand Oaks, CA.

Nja, Ove; & Rake, E. (2009). An essay on research methodology: An alternative approach to incident command research through participatory action research. *International Journal of Emergency Management, 6*(1), 55-72.

Smith, J. A. (Ed.) (2008). *Qualitative psychology: A practical guide to research methods.* Thousand Oaks: SAGE.

Smith, W., & Dowell, J. (2000). A case study of co-ordinative decision-making in disaster management. *Ergonomics, 43*(8), 1153-1166.

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Annex A Qualitative Interview Guide

Risk Perception and Risk Management: Multi Organizational Problem Solving
INTERVIEWER REFERENCE SHEET

Points to go over with respondent before the interview starts.

Context:

- These interviews are one component of a larger study examining multi-organizational problem solving during emergencies and extreme events. Other main component is an experiment where organizations go through an in vivo exercise and are required to problem solve with other types of organizations.
- The information collected in the interviews will help in interpreting the findings from the experiment.

Content:

- Interviews are being conducted with senior level decision-makers who participated directly in planning and/or responding during key events.
- Interview should take about one hour.
- We are interested in your perceptions of the challenges and opportunities that exist when making decisions with multiple organizations involved.
- During the interview, we will:
    - initially go through some background about how you were involved in [*event*]
    - then get you to focus in on one specific challenging situation where you were actively involved in problem solving and decision-making in a multi-organization context that was particularly challenging, especially one that involved multiple sectors such as the Canadian Forces, or NGOs like Red Cross or citizen associations, and multiple jurisdictions such as Federal, Provincial, and Municipal
    - ask you questions about how the group moved through the problem solving process
    - get your thoughts on how some key concepts we are using in the experiment component of the study

Questions before getting started?

Participant overview

1. To get started, can you just briefly confirm for me the organization you were with during the event and aspects like your title, main role and responsibilities, etc.? [*we want to also understand their training background both professional and experience-based – ask here if natural segue, or at the end of the interview once rapport has been established*]

Event overview and selection of situation

2. What are one or two situations planning for the event or during the event that stick out for you as being particularly challenging – I need you to think of situations that focused on problem solving or decision making, and that had a number of different types of organizations actively involved. Briefly, what would these be? [*who, what, where, when, why*]
    a. Which of these should we focus on for the remainder of the interview? [*get any additional details required*]

Problem identification and definition

3. Thinking about the situation, what problem was the most challenging that had multiple organizations involved? Who knew about the problem first? How did the other organizations become involved? How was the problem defined once other organizations became involved? What were the main areas of agreement/conflict among the players involved at this early stage? Which organizations' perspectives were dominant at this stage? Was there a lead organization or person at this stage? How were they selected?

Solution generation

4. Once the problem had been defined, how did the group generate various potential solutions? What were the solutions considered? What were the main areas of agreement/conflict among the players when it came to solution generation? Which organizations' perspectives were dominant at this stage? Was there a lead organization or person at this stage? How were they selected?

Decision making and implementation

5. Once various potential solutions had been generated, how did the group decide which solutions to implement? What were the main areas of agreement/conflict among the players when it came to deciding on which solutions to implement? Which organizations' perspectives were dominant at this stage? Was there a lead organization or person at this stage? How were they selected?

Sharing resources and flexibility

6. Thinking back to this specific situation, what types of things were shared across organizations in order to make the decision? To implement the solutions? – for example, information, resources, leadership? [*what, when, who*]

Expectations and alternatives

7. Thinking back to just before this specific situation occurred, what would have been your expectations with respect to how the situation would have played out with the organizations involved? Considering how it rolled out, what aspects surprised you?

8. Reflecting back on the situation, what should have been done differently? What should other organizations have done differently? What would/could your organization have done differently?

Concepts

9. The experimental component focuses on the concepts of coordination, cooperation and collaboration. When these terms are used, what examples or meanings would you assign to each of them? Do you see them differently? How would you differentiate them? How do you see them related to decision-making and problem-solving?

Annex B Interview Invitation Letter

Email request to organizations for recruitment

Dear Sir or Madam,

Your organization is invited by Dr Louise Lemyre from the Institute of Population Health at the University of Ottawa to participate in an interview on Risk Perception and Risk Acceptability of Public Crisis, Disasters and Emergencies, by sending this letter to some of your staff to contact us.

The goal is to conduct a series of interviews to better understand key actor's and decision-maker's perception of disasters and public emergencies, the strategies employed to solve the problems faced during complex crises, and their experience working with representatives from other organizations to solve public emergencies. This part of the project is funded by the Public Safety Canada, National Defence Canada, the Natural Sciences and Engineering Research Council of Canada, and the Social Sciences and Humanities Research Council.

The participation of your organization is important to us. Managers or directors from your organization, who have played a key role during a public crisis, such as the H1N1 plan, the SARS outbreak, the 2003 Blackout, the 1998 Ice storm or the 1997 Red River Floods, are invited to participate in an interview on risks, directed by a senior interviewer. An assistant may also be present to take notes, and a voice recorder will be used to tape the session. The identity of the participants will not appear on any of the written transcriptions. The analysis of the results will look at common themes and ideas among different organizations. This will help to better understand the important factors influencing views on disasters and public emergencies in Canadian communities. It will also serve to develop and evaluate best-practice guidelines, to assist in managing psychosocial considerations of risk perception and risk acceptability.

The interview will last approximately 1 hour either at your offices or at the University depending on the participants' preference. Questions of the following type will be asked in relation to their perception of crises, disasters or public emergencies*: "From your perspective, what was the effect of multiple organizations participating in joint problem solving? How did you experience uncertainty surrounding these situations?"* There are no right or wrong answers. We only want to know the participant's experience.

Participation is anonymous. A code number will be attributed to participants. Confidentiality and anonymity will be maintained by the research team. While global interview results of the study will be published and discussed, within the research team and at research conferences, no identifiable individual response will be shared. All of the data will be tabulated and maintained by the researchers in accordance with research confidentiality standards. Participation is completely voluntary and anonymous. Participants are free to withdraw at any time, refuse to participate, or refuse to answer certain questions. There is no direct individual or organizational benefit from answering the questions. There is no expected harm or risk.

Please contact Dr Louise Lemyre's assistant for participation, either by email at gapsante@uottawa.ca or by phone at (613) 562-5800, extension 2321, as soon as possible.

Sincerely,

Professor Louise Lemyre, Ph.D., FRSC
☎ (613)562 - 5800 (1196) ou (2321) Fax: (613)562 - 5350

louise.lemyre@uottawa.ca, gapsante@uottawa.ca
Pavillon Desmarais Hall, 55 Laurier Ave E, pièce/room 3217
Ottawa (ON), Canada, K1N 6N5

www.gapsante.uottawa.ca

Annex C Interview Consent Form

Consent form and information sheet

Dear Sir or Madam,

You are invited by Dr Louise Lemyre from the Institute of Population Health at the University of Ottawa to participate in an interview on Risk Perception and Risk Acceptability of Crises, Disasters and Emergencies.

The goal is to conduct a series of interviews to better understand the key decision maker`s perception of disasters and public emergencies, the strategies employed by them to solve the problems faced during these complex crises, and their experience working with representatives from other organizations to solve public emergencies. This part of the project is funded by Public Safety Canada, National Defence Canada, the Natural Sciences and Engineering Research Council of Canada, and the Social Sciences and Humanities Research Council.

Your opinion is important to us. You will be asked to participate in an interview and to answer questions directed by a trained interviewer. An assistant may also be present to take notes and a voice recorder will be used to tape the session. All of the discussion will be transcribed and entered in a computer file for analysis of content. The data will be conserved for a maximum of 10 years in a locked cabinet in the Gap-Santé office at the University of Ottawa and will be shredded at the end of storage. Your identity will not appear on any of the written transcriptions. The analysis of the results will look at common themes and ideas among key decision makers from different organizations. This will help to better understand the important factors influencing views on disasters and public emergencies in Canadian communities. It will also serve to develop and evaluate best-practice guidelines, to assist health professionals and other key players to effectively manage the short-term, mid-term and long-term psychosocial consequences of crises, disasters and emergency events.

The interview will last approximately 1 hour. Questions of the following type will be asked in relation to your perception of disasters and public emergencies*: "From your perspective, what was the effect of multiple organizations participating in joint problem solving? How did you experience uncertainty surrounding these situations?"* Your answers can be general and you do not have to reveal any information that you do not want to. There are no right or wrong answers. We only want to know your experience.

Your participation is anonymous. Do not use your full name. Confidentiality and anonymity will be maintained by the research team. While interview results of the study will be published and discussed within the research team, and at research conferences, **no one individual's responses** to the questions will be shared. All of the data will be tabulated and maintained by the researchers in accordance with research confidentiality standards.

Participation is completely voluntary and anonymous. You are free to withdraw at any time, refuse to participate, or refuse to answer certain questions. There is no direct individual benefit from answering the questions. There is no expected harm or risk except the possible negative feelings

sometime associated with self-reflecting on crises, disasters and public emergencies. However, in the unlikely event of distress or discomfort you may wish to contact the Confidential Help Line within your locality. You may also contact Dr Louise Lemyre at the University of Ottawa at 613-562-5800, extension 1196, or the University of Ottawa Research Ethics Board Officer at 613-562-5387 (ethics@uottawa.ca).

There are two copies of this form, one for you, one for the research team.

_____
Louise Lemyre, Ph.D.
University of Ottawa Professor

I agree to participate in this study about Risk Perception and Risk Acceptability of Crises, Disasters and Public Emergencies conducted by Dr Louise Lemyre.

_____
Participant, date

Annex D Ethics Approval Letter

File Number: 08-10-31 **Date (mm/dd/yyyy):** 09/14/2010

Université d'Ottawa
Bureau d'éthique et d'intégrité de la recherche

University of Ottawa
Office of Research Ethics and Integrity

This is to confirm that the University of Ottawa Research Ethics Board identified above, which operates in accordance with the Tri-Council Policy Statement and other applicable laws and regulations in Ontario, has examined and approved the application for ethical approval for the above named research project as of the Ethics Approval Date indicated for the period above and subject to the conditions listed the section above entitled "Special Conditions / Comments".

During the course of the study the protocol may not be modified without prior written approval from the REB except when necessary to remove subjects from immediate endangerment or when the modification(s) pertain to only administrative or logistical components of the study (e.g. change of telephone number). Investigators must also promptly alert the REB of any changes which increase the risk to participant(s), any changes which considerably affect the conduct of the project, all unanticipated and harmful events that occur, and new information that may negatively affect the conduct of the project and safety of the participant(s). Modifications to the project, information/consent documentation, and/or recruitment documentation, should be submitted to this office for approval using the "Modification to research project" form available at: http://www.rges.uottawa.ca/ethics/application_dwn.asp

Please submit an annual status report to the Protocol Officer 4 weeks before the above-referenced expiry date to either close the file or request a renewal of ethics approval. This document can be found at: http://www.rges.uottawa.ca/ethics/application_dwn.asp

If you have any questions, please do not hesitate to contact the Ethics Office at extension 5841 or by e-mail at: ethics@uOttawa.ca.

Signature:

IRobert

Isabelle Robert,
Protocol Officer for Ethics in Research
For Barbara Graves,
Chair of the Social Sciences and Humanities REB

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http://www.recherche.uottawa.ca/deontologie/index.html

Annex E Invitation Email for Recruitment

Email request to organizations for recruitment

Dear Sir or Madam,

I am inviting representatives from your organization to participate in a study at the University of Ottawa. This study has been designed to help us better understand how people in decision making roles perceive risks, assess problems and manage threats during emergencies. This study involves having people from different organizations participate in a session that is similar to a table-top exercise that focuses on a specific emergency scenario. The title of the project is Risk Management and Governance: Understanding Problem Solving and Decision Making, and it is being funded by the Social Sciences and Humanities Research Council and Defence Research Development Canada.

Who should participate?

We are hoping some representatives from your organization are able to participate in this study. The participants for this study will consist of higher-level decision makers who have had some previous experience in both strategic and operational decision-making in managing and responding to threats. They should have been in a management-level decision making role within your organization for at least one year. We will be inviting participants from various organizations to participate in the same session.

What does participation involve?

The session will last approximately three hours and will resemble a table-top exercise often used for emergency planning. The session will take place at the University of Ottawa downtown campus during regular business hours. Participants will be asked to interact with other session participants as they work through the exercises. As well, they will be asked to complete various questionnaires on perceptions and opinions of tasks, performance and interactions. All sessions will be video and audio recorded for data collection purposes. All aspects of participation are voluntary. Participants will be asked to read through and sign a consent form indicating informed consent prior to their participation in the session.

What about confidentiality and anonymity?

Data collected from participants will remain confidential. The only people who will have access to identifiable data will be members of the research team. Working files such as transcripts and questionnaires will have identifiers (e.g., names, organization) removed and replaced by an identification number. The questionnaires, audio and video tapes and the transcriptions will be kept in a secure manner in a laboratory at the University of

Ottawa to which only the researchers have access for a period of ten years. Participation in the study will not be completely anonymous, as the participant's organization will know that he or she is participating, as will the fellow session participants. Beyond this, the research team will protect the anonymity of participants by ensuring that participants' names are not provided to any group outside of the research team directly involved with this study.

What are the individual level risks and benefits associated with participating in this study?

Participation is completely voluntary. Participants are free to withdraw at any time, refuse to participate, or choose to not answer certain questions. We do not expect that there will be any harm or potential risks with the exception of potentially negative feelings sometimes associated with working directly with materials that focus on emergencies. The benefit of participation is that the study will provide useful information for the emergency planning and response community more broadly on how to potentially improve decision-making and management of emergency events.

What are the next steps?

A member of my research team will be in contact with you either by phone or email over the next few days to determine if there are any members of your organization that would be interested in participating and how they can get in contact with the research team, and to answer any additional questions you may have about the study. In the mean time, if you have questions or would like further information, please contact me directly at (613) 562-5800 x 2321 or gapsante@uottawa.ca .

Sincerely,

Louise Lemyre, Ph.D., MSRC|FRSC
Professeure titulaire | Full Professor
École de psychologie, Faculté des sciences sociales | School of Psychology, Faculty of Social Sciences
Chaire McLaughlin sur le risque psychosocial | The McLaughlin Chair on Psychosocial Risk
Directrice de l'unité de recherche GAP-Santé | GAP-Santé research unit Director
Institut de santé des populations | Institute of Population Health
Université d'Ottawa | University of Ottawa
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louise.lemyre@uottawa.ca ; gapsante@uottawa.ca
www.gapsante.uottawa.ca

Annex F Participant Consent Form

Information Sheet and Consent form

You have been invited to participate in a study entitled **Risk Management and Governance: Understanding Problem Solving and Decision Making: "*Problem-solving and Organizational Decision-making (PODS) Project*" (the "Project")**This document provides information on the study including the overall purpose of the study, what is involved in participating, possible risks and benefits, how confidentiality and anonymity will be protected by the researchers, how data will be conserved, and the voluntary nature of the study. As you read through this information sheet, please note any questions that you have or anything that you would like to have clarified by the researcher before you sign your acceptance to participate in the study.

Title of the study:	**Risk Management and Governance: Understanding Problem Solving and Decision Making: "*Problem-solving and Organizational Decision-making (PODS) Project*"**
Principal Investigator:	Louise Lemyre Professor, School of Psychology Faculty of Social Sciences University of Ottawa Tel: 613-562-5800 (ext 1196) llemyre@uottawa.ca

Funders: This study is funded by the Social Sciences and Humanities Research Council, with additional funding from Defense Research Development Canada.

Purpose of the Study: I understand that the purpose of the study is to better understand how people in decision making roles perceive risks, assess problems and manage threats during emergencies. This study involves having people from different organizations participate in a session that is similar to a table-top exercise that focuses on a specific emergency scenario.

Participation: My participation in the study will consist of one session of approximately four hours, located at the downtown campus of the University of Ottawa. During the session I will be asked to participate in an exercise that resembles a table-top exercise often used for emergency planning. I and the other participants assigned to my group for the session will be presented with a scenario and asked to complete problem-solving tasks related to the scenario. I will be asked to interact with other session participants as I work through the tasks. As well, I will be asked to complete questionnaires that ask about my perceptions and opinions of the tasks,

performance and interactions. The session will be video and audio recorded for data collection purposes, and later transcribed in an electronic file.

Risks: I understand that this research is devoid of physical and psychological risks other than the possible mild negative feelings that could be associated with working with a scenario that focuses on an emergency situation. The research team has selected the materials and developed the scenario in a manner that attempts to minimize this risk by not including graphic descriptions or negative images.

Benefits: My participation in this study will help improve understanding and provide useful information for the emergency planning and response community on how to potentially improve decision-making and management of emergency events.

Confidentiality and Anonymity: I have received assurance from the researcher that the information I will share will remain strictly confidential. I understand that the contents will be used only for research purposes and that my confidentiality will be protected: only grouped data will be reported. My participation in the study will not be completely anonymous, as the fellow session participants will know that I am participating. Beyond this, the research team will protect my anonymity by ensuring that my name is not provided to any group outside of the research team directly involved with this study.

Conservation of Data: The questionnaires, audio and video tapes and the transcriptions will be kept in a secure manner in a laboratory at the University of Ottawa to which only the researchers have access for a period of ten years.

Voluntary Participation: I am under no obligation to participate and if I choose to participate, I may withdraw from the study at any time. I may also refuse to answer any questions, without suffering any negative consequences. If I choose to withdraw, all data gathered until the time of withdrawal will be destroyed and will not be used.

Acceptance: Participation is completely voluntary. You are free to withdraw at any time, refuse to participate, or refuse to answer certain questions. There is no direct individual benefit from answering the questions. There is no expected harm or risk except the possible negative feelings sometime associated with self-reflecting on public emergencies. However, in the unlikely event of distress or discomfort you may wish to contact the Confidential Help Line within your locality. You may also contact Dr Louise Lemyre at the University of Ottawa at 613-562-5800, extension 1196, or the University of Ottawa Research Ethics Board Officer at 613-562-5387, University of Ottawa, Tabaret Hall, 550 Cumberland Street, Room 159, Ottawa, ON (ethics@uottawa.ca).I agree to participate in this study **Risk Management and Governance: Understanding Problem Solving and Decision Making: "*Problem-solving and Organizational Decision-making (PODS) Project*"** conducted by Dr Louise Lemyre.

PARTICIPANT:_____ DATE: _____

Louise Lemyre, Ph.D.University of Ottawa Professor

Annex G Task Questionnaires

G.1 Open Pod Task #1 Questionnaire

Do not complete this questionnaire until instructed to do so

Individual Participation and Perspectives - Task Questionnaire

Please reflect on **your own participation** and thoughts during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q1	I am satisfied with the problem solving processes I used during the task.	○	○	○	○	○
Q2	I am satisfied with the opportunities I had to provide input.	○	○	○	○	○
Q3	I am satisfied with the overall quality of the outcome from the task.	○	○	○	○	○
Q4	I am frustrated working with the people in my pod group.	○	○	○	○	○
Q5	I am frustrated working with the people in the other pods.	○	○	○	○	○
Q6	I participated actively in the decision making process.	○	○	○	○	○
Q7	I participated in a leadership role within my own pod.	○	○	○	○	○
Q8	I participated in a leadership role across the other pods.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q9	I facilitated discussion within my own pod.	○	○	○	○	○
Q10	I facilitated discussion between pods.	○	○	○	○	○
Q11	I recorded information on behalf of my own pod.	○	○	○	○	○
Q12	I recorded information on behalf of all pods	○	○	○	○	○
Q13	I was frustrated by differences of opinion within my pod during the task.	○	○	○	○	○
Q14	I was frustrated by differences of opinion between the other pods during the task.	○	○	○	○	○
Q15	I trust the people in my pod.	○	○	○	○	○
Q16	I trust the people in the other pods.	○	○	○	○	○
Q17	I felt a sense of belonging within my pod.	○	○	○	○	○
Q18	I felt a sense of belonging with the other pods.	○	○	○	○	○
Q19	I agree with the decisions and outcomes from the task.	○	○	○	○	○
Q20	Prior to today's session I would describe my relationship with at least one of the people in my pod as a friendship.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q22	Prior to today's session, I have worked with at least one of the people in my pod.	○	○	○	○	○
Q24	There was enough time allotted to solve the problems during the task.	○	○	○	○	○
Q25	The information and instructions given by the session facilitator were clear.	○	○	○	○	○
Q26	The task was difficult to complete.	○	○	○	○	○

Within POD Participation and Perspectives - Task Questionnaire

Please reflect on **the participation of the various people in your pod** during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q27	The outcome of the task reflects the input from all the people in my pod.	○	○	○	○	○
Q28	The differences of opinion within my pod helped us reach better decisions during the task.	○	○	○	○	○
Q29	The people in my pod actively participated in the problem solving process.	○	○	○	○	○
Q30	The people in my pod communicated effectively with one another.	○	○	○	○	○
Q31	The people in my pod were engaged in the decision making process.	○	○	○	○	○
Q32	The people in my pod generated various alternative ideas.	○	○	○	○	○
Q33	A clear leader emerged within my pod.	○	○	○	○	○
Q34	There was more than one leader within my pod.	○	○	○	○	○
Q35	Personality styles within my pod got in the way of completing the task.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q36	The people within my pod had frequent differences of opinion.	○	○	○	○	○
Q37	The people in my pod were motivated to complete the task.	○	○	○	○	○
Q38	The people in my pod were able to stay focused on the task.	○	○	○	○	○

Between PODS Participation and Perspectives - Task Questionnaire

Please reflect on **the participation of people from all the pods** during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q39	The differences of opinion across the pods helped us to reach a better decision during the task.	○	○	○	○	○
Q40	People from the other pods actively participated with people from my pod in the problem solving process.	○	○	○	○	○
Q41	The pods communicated effectively with one another.	○	○	○	○	○
Q42	People from the other pods were engaged in the decision making process.	○	○	○	○	○
Q43	People from the other pods generated various alternative ideas.	○	○	○	○	○
Q44	A clear leader emerged between the pods.	○	○	○	○	○
Q45	Personality styles between people in the different pods got in the way of completing the task.	○	○	○	○	○
Q46	People in the other pods had frequent differences of opinion.	○	○	○	○	○
Q47	The people from the other pods were motivated to complete the task.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q48	The pods were able to stay focused on the task.	○	○	○	○	○
Q49	Decisions made between my pod and the other pods were consensus-based.	○	○	○	○	○
Q21	Prior to today's session I would describe my relationship with at least one of the people in the other pods as a friendship.	○	○	○	○	○
Q23	Prior to today's session, I have worked with at least one of the people from the other pods.	○	○	○	○	○

G.2 Open Pod Task #2 Questionnaire

Do not complete this questionnaire until instructed to do so

Individual Participation and Perspectives - Task Questionnaire

Please reflect on **your own participation** and thoughts during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q1	I am satisfied with the problem solving processes I used during the task.	○	○	○	○	○
Q2	I am satisfied with the opportunities I had to provide input.	○	○	○	○	○
Q3	I am satisfied with the overall quality of the outcome from the task.	○	○	○	○	○
Q4	I am frustrated working with the people in my pod group.	○	○	○	○	○
Q5	I am frustrated working with the people in the other pods.	○	○	○	○	○
Q6	I participated actively in the decision making process.	○	○	○	○	○
Q7	I participated in a leadership role within my own pod.	○	○	○	○	○
Q8	I participated in a leadership role across the other pods.	○	○	○	○	○
Q9	I facilitated discussion within my own pod.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q10	I facilitated discussion between pods.	○	○	○	○	○
Q11	I recorded information on behalf of my own pod.	○	○	○	○	○
Q12	I recorded information on behalf of all pods	○	○	○	○	○
Q13	I was frustrated by differences of opinion within my pod during the task.	○	○	○	○	○
Q14	I was frustrated by differences of opinion between the other pods during the task.	○	○	○	○	○
Q15	I trust the people in my pod.	○	○	○	○	○
Q16	I trust the people in the other pods.	○	○	○	○	○
Q17	I felt a sense of belonging within my pod.	○	○	○	○	○
Q18	I felt a sense of belonging with the other pods.	○	○	○	○	○
Q19	I agree with the decisions and outcomes from the task.	○	○	○	○	○
Q24	There was enough time allotted to solve the problems during the task.	○	○	○	○	○
Q25	The information and instructions given by the session facilitator were clear.	○	○	○	○	○
Q26	The task was difficult to complete.	○	○	○	○	○

Within POD Participation and Perspectives - Task Questionnaire

Please reflect on **the participation of the various people in your pod** during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q27	The outcome of the task reflects the input from all the people in my pod.	○	○	○	○	○
Q28	The differences of opinion within my pod helped us reach better decisions during the task.	○	○	○	○	○
Q29	The people in my pod actively participated in the problem solving process.	○	○	○	○	○
Q30	The people in my pod communicated effectively with one another.	○	○	○	○	○
Q31	The people in my pod were engaged in the decision making process.	○	○	○	○	○
Q32	The people in my pod generated various alternative ideas.	○	○	○	○	○
Q33	A clear leader emerged within my pod.	○	○	○	○	○
Q34	There was more than one leader within my pod.	○	○	○	○	○
Q35	Personality styles within my pod got in the way of completing the task.	○	○	○	○	○
Q36	The people within my pod had frequent differences of opinion.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q37	The people in my pod were motivated to complete the task.	○	○	○	○	○
Q38	The people in my pod were able to stay focused on the task.	○	○	○	○	○

Between PODS Participation and Perspectives - Task Questionnaire

Please reflect on **the participation of people from all the pods** during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q39	The differences of opinion across the pods helped us to reach a better decision during the task.	○	○	○	○	○
Q40	People from the other pods actively participated with people from my pod in the problem solving process.	○	○	○	○	○
Q41	The pods communicated effectively with one another.	○	○	○	○	○
Q42	People from the other pods were engaged in the decision making process.	○	○	○	○	○
Q43	People from the other pods generated various alternative ideas.	○	○	○	○	○
Q44	A clear leader emerged between the pods.	○	○	○	○	○
Q45	Personality styles between people in the different pods got in the way of completing the task.	○	○	○	○	○
Q46	People in the other pods had frequent differences of opinion.	○	○	○	○	○
Q47	The people from the other pods were motivated to complete the task.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q48	The pods were able to stay focused on the task.	○	○	○	○	○
Q49	Decisions made between my pod and the other pods were consensus-based.	○	○	○	○	○

G.3 Closed Pod Task #1 Questionnaire

Do not complete this questionnaire until instructed to do so

Individual Participation and Perspectives - Task Questionnaire

Please reflect on **your own participation** and thoughts during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q1	I am satisfied with the problem solving processes I used during the task.	○	○	○	○	○
Q2	I am satisfied with the opportunities I had to provide input.	○	○	○	○	○
Q3	I am satisfied with the overall quality of the outcome from the task.	○	○	○	○	○
Q4	I am frustrated working with the people in my pod group.	○	○	○	○	○
Q6	I participated actively in the decision making process.	○	○	○	○	○
Q7	I participated in a leadership role within my own pod.	○	○	○	○	○
Q9	I facilitated discussion within my own pod.	○	○	○	○	○
Q11	I recorded information on behalf of my own pod.	○	○	○	○	○
Q13	I was frustrated by differences of opinion within	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
	my pod during the task.					
Q15	I trust the people in my pod.	○	○	○	○	○
Q17	I felt a sense of belonging within my pod.	○	○	○	○	○
Q19	I agree with the decisions and outcomes from the task.	○	○	○	○	○
Q20	Prior to today's session I would describe my relationship with at least one of the people in my pod as a friendship.	○	○	○	○	○
Q22	Prior to today's session, I have worked with at least one of the people in my pod.	○	○	○	○	○
Q24	There was enough time allotted to solve the problems during the task.	○	○	○	○	○
Q25	The information and instructions given by the session facilitator were clear.	○	○	○	○	○
Q26	The task was difficult to complete.	○	○	○	○	○

Within POD Participation and Perspectives - Task Questionnaire

Please reflect on **the participation of the various people in your pod** during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q27	The outcome of the task reflects the input from all the people in my pod.	○	○	○	○	○
Q28	The differences of opinion within my pod helped us reach better decisions during the task.	○	○	○	○	○
Q29	The people in my pod actively participated in the problem solving process.	○	○	○	○	○
Q30	The people in my pod communicated effectively with one another.	○	○	○	○	○
Q31	The people in my pod were engaged in the decision making process.	○	○	○	○	○
Q32	The people in my pod generated various alternative ideas.	○	○	○	○	○
Q33	A clear leader emerged within my pod.	○	○	○	○	○
Q34	There was more than one leader within my pod.	○	○	○	○	○
Q35	Personality styles within my pod got in the way of completing the task.	○	○	○	○	○
Q36	The people within my pod had frequent differences of opinion.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q37	The people in my pod were motivated to complete the task.	○	○	○	○	○
Q38	The people in my pod were able to stay focused on the task.	○	○	○	○	○

G.4 Closed Pod Task #2 Questionnaire

Do not complete this questionnaire until instructed to do so

Individual Participation and Perspectives - Task Questionnaire

Please reflect on **your own participation** and thoughts during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q1	I am satisfied with the problem solving processes I used during the task.	○	○	○	○	○
Q2	I am satisfied with the opportunities I had to provide input.	○	○	○	○	○
Q3	I am satisfied with the overall quality of the outcome from the task.	○	○	○	○	○
Q4	I am frustrated working with the people in my pod group.	○	○	○	○	○
Q6	I participated actively in the decision making process.	○	○	○	○	○
Q7	I participated in a leadership role within my own pod.	○	○	○	○	○
Q9	I facilitated discussion within my own pod.	○	○	○	○	○
Q11	I recorded information on behalf of my own pod.	○	○	○	○	○
Q13	I was frustrated by differences of opinion within my pod during the task.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q15	I trust the people in my pod.	○	○	○	○	○
Q17	I felt a sense of belonging within my pod.	○	○	○	○	○
Q19	I agree with the decisions and outcomes from the task.	○	○	○	○	○
Q24	There was enough time allotted to solve the problems during the task.	○	○	○	○	○
Q25	The information and instructions given by the session facilitator were clear.	○	○	○	○	○
Q26	The task was difficult to complete.	○	○	○	○	○

Within POD Participation and Perspectives - Task Questionnaire

Please reflect on **the participation of the various people in your pod** during the task that you just completed. Read each of the following statements and then rate your level of agreement on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q27	The outcome of the task reflects the input from all the people in my pod.	○	○	○	○	○
Q28	The differences of opinion within my pod helped us reach better decisions during the task.	○	○	○	○	○
Q29	The people in my pod actively participated in the problem solving process.	○	○	○	○	○
Q30	The people in my pod communicated effectively with one another.	○	○	○	○	○
Q31	The people in my pod were engaged in the decision making process.	○	○	○	○	○
Q32	The people in my pod generated various alternative ideas.	○	○	○	○	○
Q33	A clear leader emerged within my pod.	○	○	○	○	○
Q34	There was more than one leader within my pod.	○	○	○	○	○
Q35	Personality styles within my pod got in the way of completing the task.	○	○	○	○	○
Q36	The people within my pod had frequent differences of opinion.	○	○	○	○	○

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q37	The people in my pod were motivated to complete the task.	○	○	○	○	○
Q38	The people in my pod were able to stay focused on the task.	○	○	○	○	○

Annex H Background Information Questionnaire

1. What is your current job title? _____

2. How long have your worked in this position? _____ months _____ years

3. How long have you worked for this organization? _____ months _____ years

4. How long have you worked in emergency management? _____ months _____ years

5. What are your main roles and responsibilities with respect to:

a. Planning for emergencies

b. Responding to emergencies

6. What is your academic background?

a. College diplomas:

b. University degrees:

7. What is your current age? _____ years

8. Gender:

9. Which language(s) are you fluent enough in to work in? Check all that apply.

☐ French

☐ English
☐ Other
If Other, please list:

Annex I Confidentiality / Intellectual Property Agreement

Subject: **Agreement for the University of Ottawa project entitled "In Vivo Simulation of Meta-Organizational Shared Decision Making" (the "Project")**

In order to protect confidentiality of materials created and data collected over the course of the "**In Vivo Simulation of Meta-Organizational Shared Decision Making"** project, we are kindly asking reviewers of materials to agree to the confidentiality and intellectual property clauses described below.

Confidentiality:

1.1 "Confidential Information" means all data and information relating to the research project.

1.2 I understand and agree that, as part of my participation, I may have access to Confidential Information belonging to the University of Ottawa or other participants including, without limitation, the results of this project. I will regard such Confidential Information as strictly confidential and agree not to reveal any such Confidential Information to any other person, firm, corporation, company or entity unless specifically authorized to do so in writing by Louise Lemyre, the Principal Investigator of the Project. This obligation of secrecy will continue after my participation in the Project has ended.

Intellectual Property:

2.1 "Intellectual Property" includes, but is not limited to: technical information, know-how, copyrights, patents, models, patterns, drawings, specification, prototypes, and inventions.

2.2 I agree to assign ownership of all Intellectual Property I contribute to create, develop or produce as part of my participation in the Project to the University of Ottawa. I agree to execute such additional conveyances and other documents conveying title or copyright to such Intellectual Property to the University of Ottawa as the University of Ottawa may require. Should any Intellectual Property assigned to the University of Ottawa be in the form of copyrights, as an author of copyrighted Intellectual Property, I hereby permanently waive my moral rights, as defined in the Copyright Act, in respect such Intellectual Property.

Signed:

_____ _____
(Witness)

Name:_____ Date:_____

Annex J Participant ID & Information Linking Form

Participant Name:		Participant Label:	
Session #:		Session Type (check one):	○1 University of Ottawa Students ○2 Professional Students ○3 Senior Officials
Pod #:	○1 One ○2 Two ○3 Three ○4 Four	Participant #:	○1 One ○2 Two ○3 Three
Participant Organization:		Participant Type:	○1 Military ○2 ICS Oriented ○3 Non-ICS Oriented
Pod Status:	○1 Connected ○2 Closed	# Participants in Pod:	○1 One ○2 Two ○3 Three

Annex K Task Worksheets

K.1 Open Pod Collaboration Task Worksheet #1

INSTRUCTIONS

- *First 20 minutes*:
  - Work with the members of your pod on the tasks outlined in this worksheet.
  - You can use the 2-way radios or chat function to communicate with the other pods.
  - Please record your responses directly on the worksheet – these will be collected at the end of the session.
- *Next 35 minutes*:
  - The video conference line will be open with the other pods.
  - Continue to work on the tasks outlined in the worksheet.
  - Continue to record your responses directly on the worksheet.
- *Final 15 minutes*:
  - When directed, complete the questionnaire that was included in the envelope.
  - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Over the past 24 hours, there have been media reports that martial law and curfews are going to be applied. Rumours are circulating that special legislation or the Emergencies Act will be declared, giving military greater control of the city and any movement in or out of it.
- While there is no truth to any of these rumours, there are armed and protected soldiers who are guarding various sites and moving throughout the city to detect additional sources of contamination; sightings of these soldiers are adding fuel to rumours.
- As a result, nervous citizens are evacuating prematurely, ignoring instructions to shelter in place.
- There are increasing levels of criticism and concern from both citizens and local political representatives that these communication issues have not been adequately addressed.
- Criticisms include conflicting instructions to the public, messages that are vague and unclear, and major gaps in information.
- In order to address these criticisms, please work **both** within your own pod **and** with the other two pods for the following tasks outlined in the worksheet.

1) **Come to a <u>consensus</u> across <u>all</u> organizations within all the pods on the <u>two priority messages</u> or pieces of information that the group feels it is most important to relay to the general public at this point. Record these messages in the form below.**

MESSAGE #1:
MESSAGE #2:

2) **In consultation with the other organizations in all the pods, identify two potential <u>options</u> for approaches that could be used by the group to effectively deliver each of the two priority messages to the public. In developing approaches, consider <u>who</u> will deliver the message, <u>when</u> it can be delivered, what <u>venue or method</u> would be effective, and considerations to take in account if the option was to be selected.**

MESSAGE #1 – OPTION #1
Main messenger:
Timing of message:
Venue/method:
Considerations:
MESSAGE #1 – OPTION #2
Main messenger:
Timing of message:
Venue/method:
Considerations:

MESSAGE #2 – OPTION #1
Main messenger:
Timing of message:
Venue/method:
Considerations:
MESSAGE #2 – OPTION #2
Main messenger:
Timing of message:
Venue/method:
Considerations:

3) **As a group, make decisions on which option for each message is most appropriate.**

MESSAGE #1 DECISION
Decision:
Rationale for decision:
MESSAGE #2 DECISION
Decision:
Rationale for decision:

K.2 Open Pod Collaboration Task Worksheet #2

INSTRUCTIONS

- *First 20 minutes*:
  - Work with the members of your pod on the tasks outlined in this worksheet.
  - You can use the 2-way radios or chat function to communicate with the other pods.
  - Please record your responses directly on the worksheet – these will be collected at the end of the session.

- *Next 35 minutes*:
  - The video conference line will be open with the other pods.
  - Continue to work on the tasks outlined in the worksheet.
  - Continue to record your responses directly on the worksheet.

- *Final 15 minutes*:
  - When directed, complete the questionnaire that was included in the envelope.
  - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Responders travelling from other jurisdictions, contractors, volunteers as well as the various unions for the professional responders are all questioning whether or not they are being adequately protected and what standards for personal protective equipment should be imposed.
- Differing protocols and equipment are being used in the same sites, while multiple and shifting hot zones are complicating matters further.
- Another hotly debated issue is the access to Prussian Blue for responders and their families.
- Some members of the public feel that there is preferential treatment for these groups, while those with access are raising questions about the side effects and long term consequences.
- Occupational health and safety for traditional and non-traditional responders has become a major issue in the context of the scenario, both in the short term and in the longer term.

- In order to address these concerns, please work **both** within your own pod **and** with the other two pods for the following tasks outlined in the worksheet.

1) **Come to a <u>consensus</u> across <u>all</u> organizations within all the pods on the <u>two most significant responder health and safety issues</u> that you feel are most important to address. Record these issues in the form below.**

HEALTH & SAFETY ISSUE #1:
HEALTH & SAFETY ISSUE #2:

2) In consultation with the other organizations in all pods, identify two potential <u>options</u> for approaches that could be used by the group to effectively address the two health & safety issues. In developing approaches, consider <u>who</u> will deliver the interventions, <u>when</u> it can be delivered, what <u>method</u> would be effective, and <u>considerations</u> to take in account if the option was to be selected. Describe these approaches in the forms below.

HEALTH & SAFETY ISSUE #1 – OPTION #1
Who will deliver the interventions:
Timing:
Method:
Considerations:
HEALTH & SAFETY ISSUE #1 – OPTION #2
Who will deliver the interventions:
Timing:
Method:
Considerations:

HEALTH & SAFETY ISSUE #2 – OPTION #1
Who will deliver the interventions:
Timing:
Method:
Considerations:
HEALTH & SAFTEY ISSUE #2 – OPTION #2
Who will deliver the interventions:
Timing:
Method:
Considerations:

3) As a group, make decisions on which option for each health and safety issue is most appropriate. Record the decisions and rationale in the grid below.

HEALTH & SAFETY ISSUE #1:
Decision on which option to act on:
Rationale for the decision:
HEALTH & SAFETY ISSUE #2:
Decision on which option to act on:
Rationale for the decision:

K.3 Open Pod Coordination Task Worksheet #1

INSTRUCTIONS

- *First 20 minutes*:
  - Work with the members of your pod on the tasks outlined in this worksheet.
  - You can use the 2-way radios or chat function to communicate with the other pods.
  - Please record your responses directly on the worksheet – these will be collected at the end of the session.

- *Next 35 minutes*:
  - The video conference line will be open with the other pods.
  - Continue to work on the tasks outlined in the worksheet.
  - Continue to record your responses directly on the worksheet.

- *Final 15 minutes*:
  - When directed, complete the questionnaire that was included in the envelope.
  - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Over the past 24 hours, there have been media reports that martial law and curfews are going to be applied. Rumours are circulating that special legislation or the Emergencies Act will be declared, giving military greater control of the city and any movement in or out of it.
- While there is no truth to any of these rumours, there are armed and protected soldiers who are guarding various sites and moving throughout the city to detect additional sources of contamination; sightings of these soldiers are adding fuel to rumours.
- As a result, nervous citizens are evacuating prematurely, ignoring instructions to shelter in place.
- There are increasing levels of criticism and concern from both citizens and local political representatives that these communication issues have not been adequately addressed.
- Criticisms include conflicting instructions to the public, messages that are vague and unclear, and major gaps in information.
- In order to address these criticisms, please work **both** within your own pod **and** with the other two pods for the following tasks outlined in the worksheet.

1) **Determine the <u>two main messages</u> or pieces of information that you feel that it is most important for <u>you</u> to relay to the general public at this point. Record these messages in the form below. Then consult with others in your pod and in other pods to understand their priority messages. Use the form below to keep track of their messages.**

<u>YOUR</u> PRIORITY MESSAGES:

MESSAGE #1:
MESSAGE #2:

PRIORITY MESSAGES FROM OTHERS IN YOUR POD

Organization:	**Message #1**
	Message #2
Organization:	**Message #1**
	Message #2

PRIORITY MESSAGES FROM OTHERS IN OTHER PODS

Organization:	**Message #1**
	Message #2
Organization:	**Message #1**
	Message #2
Organization:	**Message #1**
	Message #2
Organization:	**Message #1**
	Message #2
Organization:	**Message #1**
	Message #2
Organization:	**Message #1**
	Message #2

2) In consultation with the other members in all the pods, determine where there are <u>overlaps in messages, potential gaps or contradictions with respect to YOUR messages</u>. Record the overlaps and gaps in the form below.

YOUR MESSAGE #1:
Identified overlaps, gaps, and contradictions with other members` messages:
YOUR MESSAGE #2:
Identified overlaps, gaps, and contradictions with other members` messages:

3) **Work with the others in your pod to determine <u>options</u> for combining or grouping messages with other members, and then <u>decide</u> on the most appropriate grouping and methods of delivery for YOUR messages that need to be delivered to the public taking into account options identified. Record the options and decisions in the grid below.**

YOUR MESSAGE #1:
Potential <u>options</u> for grouping/combining with other messages:
<u>Decision</u> on grouping or not grouping with other messages
<u>Rationale for decision on grouping or not grouping and any changes required to message if grouping:</u>
<u>Decision</u> on how message will be delivered *(who, when, venue/method)*
YOUR MESSAGE #2:
Potential <u>options</u> for grouping/combining with other messages:
<u>Decision</u> on grouping or not grouping with other messages
<u>Rationale for decision on grouping or not grouping and any changes required to message if grouping:</u>
<u>Decision</u> on how message will be delivered *(who, when, venue/method)*

K.4 Open Pod Coordination Task Worksheet #2

INSTRUCTIONS

- *First 20 minutes*:
  - Work with the members of your pod on the tasks outlined in this worksheet.
  - You can use the 2-way radios or chat function to communicate with the other pods.
  - Please record your responses directly on the worksheet – these will be collected at the end of the session.

- *Next 35 minutes*:
  - The video conference line will be open with the other pods.
  - Continue to work on the tasks outlined in the worksheet.
  - Continue to record your responses directly on the worksheet.

- *Final 15 minutes*:
  - When directed, complete the questionnaire that was included in the envelope.
  - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Responders travelling from other jurisdictions, contractors, volunteers as well as the various unions for the professional responders are all questioning whether or not they are being adequately protected and what standards for personal protective equipment should be imposed.
- Differing protocols and equipment are being used in the same sites, while multiple and shifting hot zones are complicating matters further.
- Another hotly debated issue is the access to Prussian Blue for responders and their families.
- Some members of the public feel that there is preferential treatment for these groups, while those with access are raising questions about the side effects and long term consequences.
- Occupational health and safety for traditional and non-traditional responders has become a major issue in the context of the scenario, both in the short term and in the longer term.

- In order to address these concerns, please work **both** within your own pod **and** with the other two pods for the following tasks outlined in the worksheet.

1) **Determine the <u>two most significant responder health and safety issues</u> that you feel are most important for <u>you</u> to address. Record these issues in the form below. Then consult with others in your pod and in other pods to understand their priority issues. Use the form below to keep track of their issues.**

<u>YOUR</u> PRIORITY HEALTH & SAFETY ISSUES:

HEALTH & SAFETY ISSUE #1:
HEALTH & SAFETY ISSUE #2:

PRIORITY HEALTH & SAFETY ISSUES FROM OTHERS IN YOUR POD

Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2
Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2

PRIORITY HEALTH & SAFETY ISSUES FROM OTHERS IN OTHER PODS

Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2
Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2
Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2
Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2
Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2
Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2

2) In consultation with the other members in all the pods, determine where there are <u>overlaps, potential gaps or contradictions with respect to YOUR health and safety issues</u>. Record the overlaps and gaps in the form below.

YOUR HEALTH & SAFETY ISSUE #1:
Identified overlaps, gaps, and contradictions with other members` health and safety issues:
YOUR HEALTH & SAFETY ISSUE #2:
Identified overlaps, gaps, and contradictions with other members` health and safety issues:

3) Work with the other members to decide on a plan for following up on these health and safety concerns. Describe the actions that need to be taken for YOUR health and safety issues to be addressed, taking into account options identified. Record the options and decisions in the grid below.

YOUR HEALTH & SAFETY ISSUE #1:
Potential options for grouping or combining actions to be taken with other members:
Decision on grouping or not grouping actions with other members:
Rationale for the decision on grouping/not grouping and any changes to actions required if grouping:
Decision on which actions will be implemented: *(who, when, what methods)*
YOUR HEALTH & SAFETY ISSUE #2:
Potential options for grouping or combining actions to be taken with other members:
Decision on grouping or not grouping actions with other members:
Rationale for the decision on grouping/not grouping and any changes to actions required if grouping:
Decision on which actions will be implemented: *(who, when, what methods)*

K.5 Closed Pod Collaboration Task Worksheet #1

INSTRUCTIONS

- *First 55 minutes*:
  - Work with the members of your pod on the tasks outlined in this worksheet.
  - Please record your responses directly on the worksheet – these will be collected at the end of the session.

- *Final 15 minutes*:
  - When instructed, complete the questionnaire that was included in the envelope.
  - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Over the past 24 hours, there have been media reports that martial law and curfews are going to be applied. Rumours are circulating that special legislation or the Emergencies Act will be declared, giving military greater control of the city and any movement in or out of it.
- While there is no truth to any of these rumours, there are armed and protected soldiers who are guarding various sites and moving throughout the city to detect additional sources of contamination; sightings of these soldiers are adding fuel to rumours.
- As a result, nervous citizens are evacuating prematurely, ignoring instructions to shelter in place.
- There are increasing levels of criticism and concern from both citizens and local political representatives that these communication issues have not been adequately addressed.
- Criticisms include conflicting instructions to the public, messages that are vague and unclear, and major gaps in information.
- In order to address these criticisms, please work within your pod for the following tasks outlined in the worksheet.

1) **Come to a <u>consensus</u> across <u>all</u> members within the pod on the <u>two priority messages</u> or pieces of information that the group feels it is most important to relay to the general public at this point. Record these messages in the form below.**

MESSAGE #1:
MESSAGE #2:

2) In consultation with the other members in the pod, identify two potential <u>options</u> for approaches that could be used by the group to effectively deliver each of the two priority messages to the public. In developing approaches, consider <u>who</u> will deliver the message, <u>when</u> it can be delivered, what <u>venue or method</u> would be effective, and considerations to take in account if the option was to be selected.

MESSAGE #1 – OPTION #1
Main messenger:
Timing of message:
Venue/method:
Considerations:
MESSAGE #1 – OPTION #2
Main messenger:
Timing of message:
Venue/method:
Considerations:

MESSAGE #2 – OPTION #1
Main messenger:
Timing of message:
Venue/method:
Considerations:
MESSAGE #2 – OPTION #2
Main messenger:
Timing of message:
Venue/method:
Considerations:

3) As a group, make decisions on which option for each message is most appropriate.

MESSAGE #1 DECISION
Decision:
Rationale for decision:
MESSAGE #2 DECISION
Decision:
Rationale for decision:

K.6 Closed Pod Collaboration Task Worksheet #2

INSTRUCTIONS

- *First 55 minutes*:
    - Work with the members of your pod on the tasks outlined in this worksheet.
    - Please record your responses directly on the worksheet – these will be collected at the end of the session.

- *Final 15 minutes*:
    - When instructed, complete the questionnaire that was included in the envelope.
    - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Responders travelling from other jurisdictions, contractors, volunteers as well as the various unions for the professional responders are all questioning whether or not they are being adequately protected and what standards for personal protective equipment should be imposed.
- Differing protocols and equipment are being used in the same sites, while multiple and shifting hot zones are complicating matters further.
- Another hotly debated issue is the access to Prussian Blue for responders and their families.
- Some members of the public feel that there is preferential treatment for these groups, while those with access are raising questions about the side effects and long term consequences.
- Occupational health and safety for traditional and non-traditional responders has become a major issue in the context of the scenario, both in the short term and in the longer term.
- In order to address these concerns, please work within your pod for the following tasks outlined in the worksheet.

4) **Come to a <u>consensus</u> across <u>all</u> members within the pod on the <u>two most significant responder health and safety issues</u> that you feel are most important to address. Record these issues in the form below.**

HEALTH & SAFETY ISSUE #1:
HEALTH & SAFETY ISSUE #2:

5) In consultation with the other members in the pod, identify two potential <u>options</u> for approaches that could be used by the group to effectively address the two health & safety issues. In developing approaches, consider <u>who</u> will deliver the interventions, <u>when</u> it can be delivered, what <u>method</u> would be effective, and <u>considerations</u> to take in account if the option was to be selected. Describe these approaches in the forms below.

HEALTH & SAFETY ISSUE #1 – OPTION #1
Who will deliver the interventions:
Timing:
Method:
Considerations:
HEALTH & SAFETY ISSUE #1 – OPTION #2
Who will deliver the interventions:
Timing:
Method:
Considerations:

HEALTH & SAFETY ISSUE #2 – OPTION #1
Who will deliver the interventions:
Timing:
Method:
Considerations:
HEALTH & SAFTEY ISSUE #2 – OPTION #2
Who will deliver the interventions:
Timing:
Method:
Considerations:

6) **As a group, make decisions on which option for each health and safety issue is most appropriate. Record the decisions and rationale in the grid below.**

HEALTH & SAFETY ISSUE #1:
Decision on which option to act on:
Rationale for the decision:
HEALTH & SAFETY ISSUE #2:
Decision on which option to act on:
Rationale for the decision:

K.7 Closed Pod Coordination Task Worksheet #1

INSTRUCTIONS

- *First 55 minutes*:
    - Work with the members of your pod on the tasks outlined in this worksheet.
    - Please record your responses directly on the worksheet – these will be collected at the end of the session.

- *Final 15 minutes*:
    - When instructed, complete the questionnaire that was included in the envelope.
    - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Over the past 24 hours, there have been media reports that martial law and curfews are going to be applied. Rumours are circulating that special legislation or the Emergencies Act will be declared, giving military greater control of the city and any movement in or out of it.
- While there is no truth to any of these rumours, there are armed and protected soldiers who are guarding various sites and moving throughout the city to detect additional sources of contamination; sightings of these soldiers are adding fuel to rumours.
- As a result, nervous citizens are evacuating prematurely, ignoring instructions to shelter in place.
- There are increasing levels of criticism and concern from both citizens and local political representatives that these communication issues have not been adequately addressed.
- Criticisms include conflicting instructions to the public, messages that are vague and unclear, and major gaps in information.
- In order to address these criticisms, please work within your pod for the following tasks outlined in the worksheet.

4) Determine the <u>two main messages</u> or pieces of information that you feel that it is most important for <u>you</u> to relay to the general public at this point. Record these messages in the form below. Then consult with others in your pod to understand their priority messages. Use the form below to keep track of their messages.

<u>YOUR</u> PRIORITY MESSAGES:

MESSAGE #1:
MESSAGE #2:

<u>PRIORITY MESSAGES FROM OTHERS IN YOUR POD</u>

Organization:	**Message #1**
	Message #2
Organization:	**Message #1**
	Message #2

5) **In consultation with the other members in your pod, determine where there are <u>overlaps in messages, potential gaps or contradictions with respect to YOUR messages</u>. Record the overlaps and gaps in the form below.**

YOUR MESSAGE #1:
Identified overlaps, gaps, and contradictions with other members` messages:
YOUR MESSAGE #2:
Identified overlaps, gaps, and contradictions with other members` messages:

6) **Work with the other members in the pod to determine <u>options</u> for combining or grouping the messages from the other pod members, and then <u>decide</u> on the most appropriate grouping and methods of delivery for YOUR messages that need to be delivered to the public taking into account options identified. Record the options and decisions in the grid below.**

YOUR MESSAGE #1:
Potential <u>options</u> for grouping/combining with other messages:
<u>Decision</u> on grouping or not grouping with other messages
<u>Rationale for decision on grouping or not grouping and any changes required to message if grouping:</u>
<u>Decision</u> on how message will be delivered *(who, when, venue/method)*
YOUR MESSAGE #2:
Potential <u>options</u> for grouping/combining with other messages:
<u>Decision</u> on grouping or not grouping with other messages
<u>Rationale for decision on grouping or not grouping and any changes required to message if grouping:</u>
<u>Decision</u> on how message will be delivered *(who, when, venue/method)*

K.8 Closed Pod Coordination Task Worksheet #2

INSTRUCTIONS

- *First 55 minutes*:
    - Work with the members of your pod on the tasks outlined in this worksheet.
    - Please record your responses directly on the worksheet – these will be collected at the end of the session.

- *Final 15 minutes*:
    - When instructed, complete the questionnaire that was included in the envelope.
    - Your completed questionnaire will be collected at the end of the session.

BACKGROUND INFORMATION FOR TASK

- Responders travelling from other jurisdictions, contractors, volunteers as well as the various unions for the professional responders are all questioning whether or not they are being adequately protected and what standards for personal protective equipment should be imposed.
- Differing protocols and equipment are being used in the same sites, while multiple and shifting hot zones are complicating matters further.
- Another hotly debated issue is the access to Prussian Blue for responders and their families.
- Some members of the public feel that there is preferential treatment for these groups, while those with access are raising questions about the side effects and long term consequences.
- Occupational health and safety for traditional and non-traditional responders has become a major issue in the context of the scenario, both in the short term and in the longer term.
- In order to address these concerns, please work within your pod for the following tasks outlined in the worksheet.

4) **Determine the <u>two most significant responder health and safety issues</u> that you feel are most important for <u>you</u> to address. Record these issues in the form below. Then consult with others in your pod to understand their priority issues. Use the form below to keep track of their issues.**

<u>YOUR</u> PRIORITY HEALTH & SAFETY ISSUES:

HEALTH & SAFETY ISSUE #1:
HEALTH & SAFETY ISSUE #2:

<u>PRIORITY HEALTH & SAFETY ISSUES FROM OTHERS IN YOUR POD</u>

Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2
Organization:	**Health & Safety Issue #1**
	Health & Safety Issue #2

5) **In consultation with the other members in your pod, determine where there are <u>overlaps, potential gaps or contradictions with respect to YOUR health and safety issues</u>. Record the overlaps and gaps in the form below.**

YOUR HEALTH & SAFETY ISSUE #1:
Identified overlaps, gaps, and contradictions with other members` health and safety issues:
YOUR HEALTH & SAFETY ISSUE #2:
Identified overlaps, gaps, and contradictions with other members` health and safety issues:

6) **Work with the other members to decide on a plan for following up on these health and safety concerns. Describe the actions that need to be taken for YOUR health and safety issues to be addressed, taking into account options identified. Record the options and decisions in the grid below.**

YOUR HEALTH & SAFETY ISSUE #1:
Potential options for grouping or combining actions to be taken with other members:
Decision on grouping or not grouping actions with other members:
Rationale for the decision on grouping/not grouping and any changes to actions required if grouping:
Decision on which actions will be implemented: *(who, when, what methods)*
YOUR HEALTH & SAFETY ISSUE #2:
Potential options for grouping or combining actions to be taken with other members:
Decision on grouping or not grouping actions with other members:
Rationale for the decision on grouping/not grouping and any changes to actions required if grouping:
Decision on which actions will be implemented: *(who, when, what methods)*

Annex L Consistency of Interpretation Instrument

This questionnaire is designed to assess the scenarios with respect to which facts can be recalled. Please select the best answer for each question. Circle one response for each question.

1) Where did the initial package explode?
   a. Hospital loading dock
   b. International Borders and Customs warehouse
   c. Sort and Send Mail Delivery warehouse
   d. GAP TV Station

2) Approximately how many people arrived at the examination centers set up in the hospital parking lot within the first 24 hours?
   a. 10,000
   b. 5,000
   c. 1,000
   d. 200

3) Within 24 hours, the radius evacuated around the explosion was:
   a. 500m
   b. 2km
   c. 10km
   d. 20km

4) The bomb was assembled:
   a. In a suburban house
   b. In a small town outside of GAPville
   c. In the parking lot by the hospital
   d. In a van outside the warehouse

5) The number of houses that need to be decontaminated or destroyed:
    a. 20
    b. 100
    c. 300
    d. 500

6) The spokesperson for the situation report, Mr. Robert Brights, has the title:
    a. National Emergency Manager, CBRN Team
    b. Chief of Police, Gapville
    c. Chief of Liaison, City of Gapville
    d. Director of Emergency Management, Unified Coordinating Command

7) Additional chemical protective gear for responders and volunteers was obtained from:
    a. Red Cross
    b. Pulp and Paper Mill
    c. National CBRN Team
    d. National Firefighters Association

8) What was the intended target for the bomb?
    a. Hospital
    b. Entertainment district
    c. Airport
    d. GAP TV Station

9) At the 48-hour mark, which of the following modes of transport are still partially operational?
    a. Light rail
    b. Bus lines
    c. Airport

10) Which of the following sites is not contaminated:
    a. South End LRT Station
    b. Airport
    c. Mosque
    d. Johnson Estates

Annex M Scenario Assessment Guide Contents

M.1 Scenario Assessment Guide: Scenario Complexity Rating Instructions

Estimated Time to Complete: 2 hours (40 minutes per scenario)

Steps:

1. Please review the *Information and Consent Form* located on the following page. If you agree to its contents, please sign the form.

2. Fill out the *Background Information Questionnaire.*

3. Read the definitions given for simple, complicated and complex.

4. Read the first scenario provided in this guide.

5. Considering the scenario, fill out the *Scenario Assessment Questionnaire* for the first scenario. *Note: for ease of reference, you may want to remove the questionnaire from the package and place beside the scenario.*

6. Read the second scenario provided, and complete the questionnaire.

7. Repeat with the third and final scenario.

8. Return all scenarios and completed questionnaires to the facilitator.

Thank you for your assistance.

M.2 Scenario Assessment Guide: Confidentiality / Intellectual Property Agreement

Subject: **Agreement for the University of Ottawa project entitled "In Vivo Simulation of Meta-Organizational Shared Decision Making" (the "Project")**

In order to protect confidentiality of materials created and data collected over the course of the "**In Vivo Simulation of Meta-Organizational Shared Decision Making"** project, we are kindly asking reviewers of materials to agree to the confidentiality and intellectual property clauses described below.

Confidentiality:

1.1 "Confidential Information" means all data and information relating to the research project.

1.2 I understand and agree that, as part of my participation, I may have access to Confidential Information belonging to the University of Ottawa or other participants including, without limitation, the results of this project. I will regard such Confidential Information as strictly confidential and agree not to reveal any such Confidential Information to any other person, firm, corporation, company or entity unless specifically authorized to do so in writing by Louise Lemyre, the Principal Investigator of the Project. This obligation of secrecy will continue after my participation in the Project has ended.

Intellectual Property:

2.1 "Intellectual Property" includes, but is not limited to: technical information, know-how, copyrights, patents, models, patterns, drawings, specification, prototypes, and inventions.

2.2 I agree to assign ownership of all Intellectual Property I contribute to create, develop or produce as part of my participation in the Project to the University of Ottawa. I agree to execute such additional conveyances and other documents conveying title or copyright to such Intellectual Property to the University of Ottawa as the University of Ottawa may require. Should any Intellectual Property assigned to the University of Ottawa be in the form of copyrights, as an author of copyrighted Intellectual Property, I hereby permanently waive my moral rights, as defined in the Copyright Act, in respect such Intellectual Property.

Signed:

_____ _____

(Witness)

Name:_____ Date:_____

M.3 Scenario Assessment Guide: Background Information Questionnaire

10. What is your current job title? _____

11. How long have your worked in this position? _____ months _____ years

12. How long have you worked for this organization? _____ months _____ years

13. How long have you worked in emergency management? _____ months _____ years

14. What are your main roles and responsibilities with respect to:

a. Planning for emergencies

b. Responding to emergencies

15. What is your academic background?

a. College diplomas:

b. University degrees:

16. What is your current age? _____ years

17. Gender:

18. Which language(s) are you fluent enough in to work in? Check all that apply.

- ☐ French
- ☐ English
- ☐ Other

If Other, please list:

M.4 Scenario Assessment Guide: Definitions of Simple, Complicated and Complex

Simple, complicated and complex can be conceptualized as a continuum ranging from *simple* to *complex*, with *complicated* located at the midpoint of the continuum.

Simple → Complicated → Complex

Simple situations can be defined as those that are well understood, and involve a minimal number of organizations to resolve satisfactorily. A simple situation is well understood and thus each organization follows standard operating procedures. In simple situations, solutions are known and the scope of the situation is within an organization's capability.

Complicated situations are characterized as generally well understood, but they involve multiple interrelated organizations. One main difference between simple and complicated situations is the number of organizations required to resolve the situation, and the dynamic nature of the situation. The main similarity is that the situation is relatively well understood, including the cause and effect relationships between actions and outcomes. The situation, including the effect of interventions, is relatively well understood. In complicated situations, the solutions are known but the scope is beyond one organization's capability.

Complex situations involve considerably fewer "knowns" than either *simple* or *complicated* situations. Due to the high level of uncertainty, the cause and effect relationship between actions and outcomes becomes unclear. Also characteristic of complex situations is that standard actions or procedures that might be commonly used in less complex situations can cause large ripple effects that then further contribute to the complexity of the situation. In complex situations, the solution is partly unknown and the scope is well beyond one organization's capability.

M.5 Scenario Assessment Guide: Blackout Scenario

Wednesday 6:00 am
Wednesday morning, the province of Anticipate is covered in ice after one night of unexpected heavy frozen rain. The hardest hit city of Gapville wakes up to over 43 mm of ice build-up, strong winds, plummeting temperatures of minus 20 degree Celsius weather and a power outage across the entire city. Traffic lights aren't working, bank machines, point-of-sale purchases and gas pumps are inaccessible. Public transit is paralyzed with the weather conditions and the blackout.

The municipal government orders all snow removal teams onto the roads, but they are overwhelmed, and need support. Gapville Hydro workers are trying to find the source of the city-wide power outage, and are repairing the ice damaged lines as fast as possible.

Wednesday 12:00 pm
The McLaughlin Memorial Hospital is facing serious challenges. The back-ups power systems have failed for unknown reasons. Without power, or working back-up systems, critical patients are in dire need. The emergency room is already becoming busy with increased accidents due to the icy conditions, and vulnerable patients with exposure to the cold from a morning with no heat. The head of the hospital contacts the municipal government, and asks for help transferring and sheltering patients.

Wednesday 2:00 pm
The Gapville municipal government asks the local Fire and Police departments to call in all available personnel to deal with the slippery streets, and the overflow in the crippled hospital. Mobilizing the municipal forces is difficult due to the chaotic state on the roads. It takes several hours for help to arrive on the streets and in the hospital.

Wednesday 6:00 pm
Within twelve hours, Gapville Hydro workers have managed to restore the power to a limited section of the city. However, hydro workers are beginning to find suspicious activity not indicative of a power failure. Notably, backup systems for the McLaughlin Memorial Hospital and the Gapville Transit system are still not operational. These backup systems run on generators, an independent power supply, and should technically not be affected by the power outage. Gapville Hydro arrives with additional generators at the Hospital, and attempt to hook-up the network. Again, efforts fail, power cannot be restored, and patients must be evacuated.

Facing the first night with no heat or light, many of Gapville’s local community networks begin to mobilize their own resources, walking to neighbours who may be vulnerable, and opening the community centers and churches, offering shelter for those who need to

get warm. Fuel is an issue, for building generators, and the portable generators being supplied by local citizens.

Municipal road crews are still hard at work, as is Gapville Hydro, clearing roads and repairing damaged power lines. EMS is now also working with health care workers to move patients from the Hospital to the local community center, which has been outfitted with an industrial sized generator donated from the local lumber yard. There are concerns that fuel for the generator will only last one night.

Thursday 7:00 am
The municipal government contacts the Province, asking them to request the assistance of the Armed Forces to provide specialized equipment to help with the road clearing and continuation of vital services. The mayor also asks for additional fuel and generators to be brought in. The military agree to allocate some of their resources to Gapville, and announce they will be arriving in two days. As the ice-storm affected most of the province of Anticipate, the military has several sites they need to attend to, and inter-provincial travel is still slow.

Thursday 1:00 pm
After working around the clock for over 31 hours, Gapville Hydro workers discover the back-up system failures at the Hospital and the Transit System are due to computer issues, and not the downed power lines. Hydro sends their computer analysts to the McLaughlin Memorial Hospital and the GapTransit main street terminal, to try to reboot the back-up emergency systems.

Thursday 5:00 pm
The community center and local churches are becoming crowded with people seeking heat and light, for the second night of the power outage. With the blackout there is limited access to television or internet for information. Battery operated radios are used to collect any information available. Due to the blackout, the local radio station is still unable to broadcast using the GapTV tower, so the only news available is from the National Radio Service. The information is broad, and community specific information is hard to come by. The only specific information for Gapville is that Hydro Company is still unable to provide a time-frame for restoration of power.

Thursday 10:00 pm
Volunteers and Emergency Response agencies are doing what they can to identify vulnerable groups, and to get to those most in need of help. The senior's home is in the blackout area, and exposure to cold is becoming an increasing concern. Many private groups have banded together to help, providing fuel, generators, hand crank cell phone chargers, blankets and candles. Several people have been found using incredibly dangerous practices for heat, for example, using gas powered generators and BBQ's indoors.

Friday 9:30 am
Hydro authorities contact Communications Co., the software and hardware suppliers for the systems at the hospital and the transit system. Gapville Hydro explains that they have been unable to reboot the back-up systems, and there is still no power supply at the Hospital or at the Transit System. The Communications Company sends senior analysts to the power plant.

Friday 12:00 pm
Power has been restored at GapTV, where the city's communication tower resides. Broadcast resumes in a limited for local television and radio. Gapville Hydro expects it will take another two days for power to fully return to the city. The lack of information is beginning to cause the formation of rumours. With two nights of no heat or light, citizens are getting frustrated, and are wondering when the power will be back online. There have been rumours of a fire at the Hydro Station that will make power restoration incredibly difficult, and could take up to a month to fix. Many people are planning larger scale evacuations due to this misinformation, some are planning on staying with family in other cities and many are hoping that commuter trains, or flights will soon be running. The train station and airport are beginning to see a lot of people arriving frustrated with plans of evacuation and no way to carry them out.

INJECT – Task #1

Saturday 8:00 am
The Armed Forces arrive in Gapville with road clearing materials, supplies for shelters, generators and additional fuel supplies. The arrival of the military provides some relief to the distressed citizens. Gapvillians feel that their Mayor has taken some steps to ensure their safety, but are still frustrated with the lack of communication.

Saturday 2:30 pm
The Communications Company discovers the source of the computer failure was due to compromised hardware. The Hospital's computers and backup safety systems were built using counterfeit microchips which allow backdoor access to hackers. According to the serial numbers, the compromised hardware arrived in a large shipment last year. This revelation also takes the power failure from an accident to an attack. When this revelation is made, the Reframe Federal Government is alerted, and investigators from the federal cyber task force are sent to Gapville. They should arrive by Monday morning.

Sunday 12:00 pm
The combined efforts of fire police and emergency services, working alongside the military, volunteer services, municipal crews, and Gapville Hydro has made serious headway into road clearing and power restoration. Over a quarter of the city has clear roadways and power. Several churches and public buildings can now be safely used for shelter, with heat and light.

Monday 11:00 am
Private analysts track down all the infected computer systems in the city. In total, three infected systems are identified. The first identified is at the McLaughlin Memorial Hospital. The newly upgraded computer patient tracking systems are compromised. These systems run on a national E-Health network, and there is concern that confidential medical information all across the country of Reframe has been hacked. The local GapTransit system has compromised hardware in its recently installed navigation systems. And finally, the National Bank switched to new teller and ATM software 6 months ago, for all of their branches across the province.

Monday 2:00 pm
The potential size and scope of the computer recall, and the damage expected to the city's infrastructure during recalls and retrofitting is overwhelming. The obviously malicious and well-coordinated computer infiltration has federal investigators concerned it is a terrorist attack.

The freezing rain and ice pellets end and the skies clear. It is still very cold, at -22 degrees Celsius. The change in weather allows municipal road workers and the military to get ahead on the road clearing. Hydro workers are also able to get almost half of the city's power up and running.

Monday 4:30 pm
Communications Co. send specialists to the McLaughlin Memorial Hospital, to replace their faulty systems. The hospital is still without main power, but once the backup computer systems are restored, the generators are functioning, the ICU and Emergency Room have limited power, and there are limited lights, but there is heat. It will still take time, however, to get the patient tracking and E-Health networks secured.

Tuesday 9:00 am
The Federal Government, the Gapville Municipal government and P-RAM communications hold a press conference at GapTV for those residents with power. The Gapville Mayor explains that power is coming back on-line, but will not be fully restored for two more days. The weather forecasts are looking clear for the next week, and should allow the road crews and military to complete their work on clearing the city within the next few days as well. The mayor provides a list of available shelters, and some recommendations for health and safety during this difficult time. The federal cyber task force investigators then explain that the power failures are not fully caused by the ice storm. There were computer failures at the Hospital, the GapTransit System and the National Bank, caused by malicious compromised hardware. The investigators explain that embedded chips are built into the computers, and allow access to vital infrastructure computer systems. Because of these hacked computer chips, back-up emergency systems failed, and have created a devastating breach of privacy in health and financial records, nationwide. The government asks people to remain calm, and not to attempt to withdraw

their savings from the banks. Officials ask for patience, and trust that they will be able to correct these vital systems soon.

Communications Co. explains they were victims of counterfeit hardware purchase. Due to the recall of these systems, the banking system will be off-line until security can be ensured, and the transit system will not be operational for at least a week. The hospital has backup systems functioning, and full power will be restored soon, but all non-essential procedures will be suspended until the E-Health network can also be secured.

Tuesday 2:00 pm
Gapvillians are all reeling from the breadth and scope of the cyber attack on their nation. The entire country feels the effect of the largest national bank going off-line, and the province is still mostly covered in ice. The official press conference has left people feeling vulnerable and scared. There is a run on the banks, with many people attempting to withdraw their savings. But with systems down, the tellers are unable to complete any transactions. As people become more frightened, security concerns arise, and police are called away from their efforts in the hospitals and on the ice-clogged streets to guard the banks, and keep some order.

Tuesday 6:00 pm
The city is preparing for another night with no heat in many areas. Roads are still blocked in many smaller streets, but the main thoroughfares and the highway have been cleared. While the municipal road crews finish the clearing the military turns to helping with shelter for the over 100,000 people still without power. At the same time, the private sector analysts and federal investigators are working hard on the first recalls, and tracking down the source of the cyber-attack.

Task #2

M.6 Scenario Assessment Guide: Scenario Assessment Questionnaire – Blackout Scenario

This form is designed to capture a reader's understanding of what contributes to the complexity of a given scenario. Potential contributions to complexity for a scenario are described below in terms of impact, uncertainty and vulnerability, with specific challenges or areas noted for each. After reading the scenario, the reviewer is asked to rate the degree to which each challenge was evident in the scenario. The results will be compared with data collected from other reviewers to select a suitably complex scenario for use in a simulation exercise.

Q1 Overall, which of the following descriptors best describes the scenario?

- ☐ Simple
- ☐ Complicated
- ☐ Complex

Please rate the extent to which each of the following challenges is evident in the scenario. Use the scale ranging from 0 (not at all evident) to 4 (strongly evident).

		0	1	2	3	4
	Impact					
Q2	Impact severity *(i.e., number of fatalities /casualties, amount of physical damage/ psychological trauma, degree of social disruption/multiple events)*					
Q3	Impact scope *(i.e., breadth of impact on people, services, structures, societal functions)*					
Q4	Impact timing *(i.e., no threat/warning phase, sudden onset, sustained duration, and/or recurring event)*					
Q5	Media involvement *(i.e., extensive media coverage, lack of access to official sources, inappropriate use of social media tools)*					
Q6	Political processes *(i.e., multiple organizations involved, multiple jurisdictions, and/or multiple levels of government, public fear and/or mistrust in officials)*					
	Uncertainty					

		0	1	2	3	4
Q7	Novelty of situation *(i.e., novel hazard, malicious cause, lack of experience, lack of controllability, and/or latent impacts)*					
Q8	Anticipation and planning *(i.e., lack of planning, rehearsal, and sharing of plans, and/or lack of integration of plans)*					
Q9	Data and information *(i.e., lack of access to information, inaccurate information, lack of credible information sources, excessive volume of data, and/or fast speed of information flow)*					
Q10	New organizations and partners *(i.e., presence of non-traditional organizations and partners, and/or presence of emergent organizations or ad-hoc groups that self-organize to fill perceived resource gaps)*					
Q11	Changing context *(i.e., big changes in situation context, fast speed of change, actual/perceived negative consequences of change, and/or negative impacts of intervention (negative secondary effects)*					
Q12	Flexibility of interpretive frameworks *(i.e., imposed/unilateral processes, lack of common/shared processes, and/or lack of creativity/improvisation)*					
	Vulnerability					
Q13	Economic development *(i.e., lack of resources, lack of economic diversity, unequal distribution of wealth, and/or economic instability)*					
Q14	Social capital *(i.e., large number of at-risk populations, lack of social support, poor citizen participation in volunteering and decision making, poor sense of community, and/or excessive/insufficient attachment to place)*					
Q15	Community competence *(i.e., political instability, poor leadership skills, low literacy and education levels, lack of experience with similar hazards, and/or lack of community partnerships and support)*					

		0	1	2	3	4
Q16	Information and communication *(i.e., unreliable or excessive amounts of extraneous information, public opinion ignored, lack of trusted media spokesperson, ineffective risk messaging, and/or poor communication infrastructure capabilities)*					
Q17	Other infrastructure *(i.e., high degree of interdependence among critical systems, lack of redundant or backup systems, and/or weak or blocked distribution networks)*					

Q18 In your estimation, which of the following factors contributed most to the level of complexity in the scenario? Please check one box and explain your choice.

- ☐ Impact
- ☐ Uncertainty
- ☐ Vulnerability
- ☐ All of the above (factors influenced the assessment equally)

Please explain why:

Please rate the overall level of complexity of the scenario on a scale of 0 (not at all complex) to 4 (very complex).

		0	1	2	3	4
Q19	Overall, I would describe the level of complexity for the scenario as:					

Please rate your level of agreement with the following statements on a scale of 0 (strongly disagree) to 4 (strongly agree).

		0	1	2	3	4
Q20	The first part of the scenario is realistic / plausible.					
Q21	The second part of the scenario is realistic / plausible.					
Q22	The timeline for the scenario is realistic / plausible.					

M.7 Scenario Assessment Guide: Mail Scenario

Monday 4:00 pm
There is a small explosion and fire at the Sort & Send Mail Delivery (SSMD) warehouse in Gapville. The employees put out the fire with a couple of fire extinguishers while calling 911. There are approximately 50 other employees in the building.

Three employees are injured from the event. The employee who was handling the package at the time of explosion has more serious injuries. The two employees with minor injuries are given first aid and taken by another employee to the hospital. They don't want to wait for the ambulance and don't feel the need for emergency treatment. They are seen for workers' compensation reasons and released from the hospital. All of the remaining employees in the facility stay at the warehouse and continue working.

The Gapville fire department arrives and gives initial medical care to the more seriously injured employee. The paramedics then arrive to take over his care. They transport him to the hospital trauma centre where he is seen in the emergency department and, given his injuries, is admitted to the hospital for treatment of burns and a fractured arm. The ambulance crew returns to service and responds to other calls throughout the city. The fire department ensures that there is no further damage or fire and calls the Gapville police department since it appears to be a suspicious fire. The fire crews return to their stations. The police determine from SSMD records that the package had been dropped off early in the day and was to be delivered to the GapTV television station the next day.

Monday 7:00 pm
All of the emergency personnel in Gapville - EMS, Fire, Police and Hospital staff complete shift changes between 4:00 pm and 6:00 pm. Those responders who were on the scene of the SSMD explosion now are off-duty, and travel to home, schools, restaurants and other recreational activities.

Gapville Police Station #2 receives an anonymous call, announcing that a dirty bomb has been sent to the GapTV television station. The police connect the call with the situation at the SSMD warehouse and call the HazMat team, Federal Investigators, the Military, and the Provincial Government. If this caller's information is true, this revelation takes the SSDM explosion from a potential accident to a radiological attack. The military announce they will arrive within 72 hours.

Monday 10:00 pm
After a brief investigation, the HazMat team determines that the explosion spread approximately one ounce of Cesium 137 in the building. Initial readings of the exposure level at the site were 100 rems/hour; however, those who were one meter from the

explosion received a dose of 1000 rems/hr and those 10 meters away, between 100 and 543 rems/hr. Those who handled the patient were exposed to slightly higher dosages because the dust came off of the patient's clothing and transferred to them. Other hospital staff and patients in the treatment area of the emergency room received between 10-15 rems/hour.

The explosion was contained for the most part in the SSDM facility and all those who had been there were exposed and contaminated to varying degrees. Employees had used fire extinguishers to combat the flames, and the force of extinguishers spread the Cesium 137 around the ventilation ducts in the warehouse. All responders were also exposed and some experience some degree of radiation sickness over the coming days depending on how close they were to the source and the patient.

In addition, for those in the facility, the long term risks of cancer increased significantly as a result of exposure to inhalation of contaminated dust particles. Employees, police, EMS and fire fighters received a dose of radiation that increased their risk of cancer to 1 in 5. Those in the hospital emergency room increased their cancer risk to 1 in 50. An additional risk was created by the dust particles on the clothing and equipment that was in taken home, or into the public, by individuals. This increased the cancer risk in areas of the public to about 1 in 100.

At about the same time that the HazMat team confirmed the presence of Cesium 137, the SSMD employee who was hospitalized earlier begins to show initial symptoms of radiation exposure and his condition becomes critical. When notified by the police, the hospital calls a "code brown", for hazardous materials, and closes the emergency department to all incoming cases. After three hours, all three injured SSMD employees begin to show signs of radiation sickness. The most seriously injured patient is now critically ill while the others, who are at home, are less ill but are showing signs of nausea and red skin.

Tuesday 9:00 am
Tracking is underway for all those who were in contact with the SSMD patients or who were at the scene of the event. In addition, Public Health authorities are tracking any people who were at the ER when the SSMD patients came in. Working in conjunction with GapTV, the authorities hold a press conference. They ask that anyone who was in the exposed buildings, or near an affected victim to go to the hospital to get checked out. The municipal authorities have set up temporary exam centers in the parking lot of the McLaughlin Memorial Hospital. All who were directly exposed will become ill within 72 hours and will be showing different signs of radiation exposure over the coming weeks.

Tuesday 7:30 pm
Hospital staff has worked overtime, dealing with the influx of patients, coupled with the loss of employees who have been exposed to radiation.

Hospital authorities request help from the neighbouring city's Hospital. There is confirmation that the other SSMD employees, the paramedics and the initial ER staff who treated the SSMD employees were exposed to radiation and with treatment will survive, but with unknown impacts. All of the fire fighters, EMS and police at the scene were also exposed to varying degrees of radiation. At the moment, 22 people are hospitalized for treatment of sub-lethal but serious effects of radiation exposure; another 65 are following out-patient treatments. Thousands have arrived at the examination centers set up in the hospital parking lot. No one can estimate however, the degree of exposure and the risk for each, either in the short or long term. Family members for most of the responders have been found to have varying levels of exposure as a result of the contaminated clothing brought home. Potentially exposed children are now the focus of intensive surveillance and monitoring. It is estimated that the risk for cancer may be as high as 1 in 50 for some of them.

Wednesday 9:00am
GapTV broadcasts another press conference. Authorities announce there have been no further bombs or threats. Sadly, there is one confirmed death, the critically injured SSMD employee, as a result of acute radiation exposure. Due to the amount of contamination, the employee was buried in a lead coffin sealed in concrete. It is likely that the two SSMD employees who initially exhibited minor physical injuries will also pass away. Federal investigators have arrived and announce they have yet to track down the source or motives for this attack. The public is scared and uncertain as to the source of the radiological attack, and are very concerned about their exposure and their children's exposure to radiation. Equally there is a loss of public trust. How could authorities have allowed contaminated responders to go out into the public after their shift? Why was this not caught in time?

Officials are unable to give full exposure estimates but have taken a variety of actions intended to restore public confidence. The fire stations that went to the fire have been closed and their equipment and vehicles are being decontaminated. The ambulance, the hospital emergency room (ER) and the rooms where the patients were handled are also being decontaminated. The hospital itself has completely shut down and moved patients to other facilities.

Wednesday 5:30pm
The police investigation identifies those responsible and where they assembled the bomb. They have so far eluded the police, and it is thought they may have fled the country. There is concern that they possibly contaminated themselves during the bomb assembly, and that they may be spreading the contamination as they travel. The authorities have not been able to determine how they left or where they went.

The perpetrators used a suburban house, which is now contaminated. The area for several blocks around it is evacuated and sealed off while authorities start to conduct additional tests. As they conduct these tests, they discover a natural source of radon which creates

an additional concern for the people living in that area. There is a lot of confusion about different sources and the public is not distinguishing between types of radiation but are insisting that they be protected from any type.

Thursday 8:00am
There have been no further bombs or threats; however, there has been additional loss of life. Over 15 people have died. Local funeral homes have stated that they do not want to handle the bodies for fear of contamination. The families are upset, believing they are not receiving adequate information or support. There is inconsistent media coverage with different "experts" recommending a wide variety of methods for handling the sick and deceased, including burial in lead coffins.

Thursday 3:30pm
The military arrive, and help with many different needs, moving critical patients from the shopping mall to more appropriate treatment centers, such as the walk-in clinics and the assisted living homes. They also set up additional evacuation centers, for those displaced from the affected area, and set up decontamination sites at many different locations across the city.

Thursday 5:00pm
Family members for all of the responders are found to have varying levels of exposure as a result of the contaminated clothing being brought home. Children are the focus of intensive surveillance and monitoring. Media reports have suggested that they will have a long-term increased risk of developing cancer, which creates some public anxiety and demand for more testing and information. There is significant internet chatter regarding the long-term outcomes of this event.

Task #1

Friday 10:15 am
Each day, people turn up at the hospital asking to be screened and treated, insisting that they have been exposed or manifesting symptoms of radiation exposure. Additionally, people are demanding to know how long-term monitoring will be carried out, and in what way will they be treated and/or compensated if they develop cancer.

There is considerable scepticism that the estimate of those exposed is accurate; many suspect the number is being downplayed by authorities. Thus, there is a growing demand that Prussian Blue, the only known treatment, to be widely distributed to the population, even to anyone who might have been remotely exposed to the contamination. Prussian Blue is not licensed for use in this country and requires a special license from Public Health for this purpose. Officials are reluctant to provide anything other than limited access. There is not enough Prussian Blue available to provide widespread treatment, so only those first responders with confirmed exposure have been given the treatment. The first responders demand that their family members be provided access also. The SSMD

employees, who suffered just as much radiation exposure as the first responders, demand treatment both for themselves and for their families.

Saturday, 12:00pm
Monitoring of people living in the neighbourhood where the bomb assembly took place has not found any people with exposure to radiation. Officials, however, are not able to reassure people that there will be no long-term negative effects. Those who have been evacuated are demanding assistance in covering their costs, as well as compensation for their homes which they say will not sell any time in the foreseeable future.

The SSMD site has been sealed for both decontamination and the police investigation. Other businesses in the area have shut down, and tests are being conducted to determine if there has been any leakage from the SSMD facility. Traffic in the area remains closed which creates a number of problems for businesses in the vicinity. Again, military support is needed to handle the flow of traffic, enforce the evacuation zone, and provide shelter and support for those displaced persons. The military work with local authorities, and volunteer agencies to try to mitigate some of the more unpleasant effects of evacuation and decontamination.

Monday 9:00am
It is announced that the SSMD facility will have to be demolished along with all of the material that was in it. All of the packages and documents in the facility have to be destroyed. This creates problems for some of the companies affected. Insurance claims pour in, and SSMD is struggling to maintain its customer base across the country. Courier services in general have seen a significant drop in business.

Announced plans to re-open the fire station and the hospital are met with strong public opposition. The public demands assurance that the decontamination efforts will be 100% effective and that there is no further risk of exposure.

Thursday 9:00am
There are a number of lawsuits being filed against the emergency services for not protecting the public and further endangering people in the vicinity of the station and along the routes that they traveled on. The hospital has a series of legal actions claiming that people died as a result of the decision to close and transfer them.

There are numerous issues related to the removal of contaminated material – i.e., where it will go and how it will be disposed of. This has caught the media's attention as well as that of numerous groups who do not want it transported along city streets to wherever it will finally end up. It has been estimated that the main site clean-up will take 6 to 8 months. There are conflicting reports about the risks posed to the community during this activity. There is also a debate about how much of an area should be cleaned up – 2 blocks or 10 blocks around each of the different sites. The amount of waste from the

SSMD warehouse is estimated to fill a football field waist deep. There is a suggestion that the entire area be abandoned and closed off for 20 to 30 years.

Clean-up costs are estimated to be in the billions of dollars. There is an ongoing issue about which level of government will be responsible for what costs. Insurance companies are claiming that since it was an act of terrorism, any policies are null and void.

Task #2

M.8 Scenario Assessment Guide: Scenario Assessment Questionnaire – Mail Scenario

This form is designed to capture a reader's understanding of what contributes to the complexity of a given scenario. Potential contributions to complexity for a scenario are described below in terms of impact, uncertainty and vulnerability, with specific challenges or areas noted for each. After reading the scenario, the reviewer is asked to rate the degree to which each challenge was evident in the scenario. The results will be compared with data collected from other reviewers to select a suitably complex scenario for use in a simulation exercise.

Q1 Overall, which of the following descriptors best describes the scenario?

- ☐ Simple
- ☐ Complicated
- ☐ Complex

Please rate the extent to which each of the following challenges is evident in the scenario. Use the scale ranging from 0 (not at all evident) to 4 (strongly evident).

		0	1	2	3	4
	Impact					
Q2	Impact severity *(i.e., number of fatalities /casualties, amount of physical damage/ psychological trauma, degree of social disruption/multiple events)*					
Q3	Impact scope *(i.e., breadth of impact on people, services, structures, societal functions)*					
Q4	Impact timing *(i.e., no threat/warning phase, sudden onset, sustained duration, and/or recurring event)*					
Q5	Media involvement *(i.e., extensive media coverage, lack of access to official sources, inappropriate use of social media tools)*					
Q6	Political processes *(i.e., multiple organizations involved, multiple jurisdictions, and/or multiple levels of government, public fear and/or mistrust in officials)*					
	Uncertainty					

		0	1	2	3	4
Q7	Novelty of situation *(i.e., novel hazard, malicious cause, lack of experience, lack of controllability, and/or latent impacts)*					
Q8	Anticipation and planning *(i.e., lack of planning, rehearsal, and sharing of plans, and/or lack of integration of plans)*					
Q9	Data and information *(i.e., lack of access to information, inaccurate information, lack of credible information sources, excessive volume of data, and/or fast speed of information flow)*					
Q10	New organizations and partners *(i.e., presence of non-traditional organizations and partners, and/or presence of emergent organizations or ad-hoc groups that self-organize to fill perceived resource gaps)*					
Q11	Changing context *(i.e., big changes in situation context, fast speed of change, actual/perceived negative consequences of change, and/or negative impacts of intervention (negative secondary effects)*					
Q12	Flexibility of interpretive frameworks *(i.e., imposed/unilateral processes, lack of common/shared processes, and/or lack of creativity/improvisation)*					
	Vulnerability					
Q13	Economic development *(i.e., lack of resources, lack of economic diversity, unequal distribution of wealth, and/or economic instability)*					
Q14	Social capital *(i.e., large number of at-risk populations, lack of social support, poor citizen participation in volunteering and decision making, poor sense of community, and/or excessive/insufficient attachment to place)*					
Q15	Community competence *(i.e., political instability, poor leadership skills, low literacy and education levels, lack of experience with similar hazards, and/or lack of community partnerships and support)*					

		0	1	2	3	4
Q16	Information and communication *(i.e., unreliable or excessive amounts of extraneous information, public opinion ignored, lack of trusted media spokesperson, ineffective risk messaging, and/or poor communication infrastructure capabilities)*					
Q17	Other infrastructure *(i.e., high degree of interdependence among critical systems, lack of redundant or backup systems, and/or weak or blocked distribution networks)*					

Q18 In your estimation, which of the following factors contributed most to the level of complexity in the scenario? Please check one box and explain your choice.

- ☐ Impact
- ☐ Uncertainty
- ☐ Vulnerability
- ☐ All of the above (factors influenced the assessment equally)

Please explain why:

Please rate the overall level of complexity of the scenario on a scale of 0 (not at all complex) to 4 (very complex).

		0	1	2	3	4
Q19	Overall, I would describe the level of complexity for the scenario as:					

Please rate your level of agreement with the following statements on a scale of 0 (strongly disagree) to 4 (strongly agree).

		0	1	2	3	4
Q20	The first part of the scenario is realistic / plausible.					
Q21	The second part of the scenario is realistic / plausible.					
Q22	The timeline for the scenario is realistic / plausible.					

M.9 Scenario Assessment Guide: Train Derailment Scenario

Monday 11:45 am
It is the first Monday in June, during a heat wave that has left Gapville hot and humid. At 11:45 am a freight train derails only half a kilometre away from the National Rail (NR) station. The NR radio from the station for help, and inform responders there was a train derailment, and an explosion has occurred.
Within minutes, first responders are on the scene. Six chemical containment cars are breached, sending a large yellowish haze of chemical up into the air. Paramedics wear respirators and gloves as they scramble to get the seriously wounded and chemically exposed to hospital.

Monday 1:00 pm
NR authorities have identified the chemical leak as Carbonyl Chloride, a phosgene chiefly used in the production of polymers including polyurethanes, and polycarbonates. The toxicity of a phosgene is mainly due to the HCl (hydrogen chloride) that is released with its reaction with water. Even small amounts of water can trigger the toxic reaction, such as clouds, or even entry into the lungs.

A fatal dose of phosgene eventually leads to shallow breathing and retching, rapid pulse, an ashen face and the discharge of 2 liters of yellow liquid from the lungs each hour for the 48 hours of the drowning spasms that occur following exposure.

The protocol for an HCl leak is immediate removal from the area, and protection for those downwind of the chemical. Equally important, those who have been in direct contact with the chemical should not be taken to hospital, as they carry contaminants on their clothing and skin. The hospital is immediately notified of the nature of the chemical contamination. The hospital immediately performs decontamination of all the train derailment victims and health care workers who came in contact with these patients.

Monday 4:00 pm
Within a couple of hours, the chemical cloud has spread from the accident site at the central north end of the city, through the downtown corridor to south central Gapville, effectively splitting the city into two halves. Due to the high level of humidity the normally heavy gas is able to react with low laying haze, and slowly drift through the city.

Authorities are recommending evacuation for Gapvillians in the directly affected areas due to the highly toxic nature of Carbonyl Chloride, and the forecasted continued hot and humid weather conditions.

Monday 5:00 pm
With the size and scope of the evacuation and decontamination, Gapville's resources are stretched to the limit. Police and the Fire department are still on scene at the site of the derailment. Rescue and clean-up are incredibly difficult with the chemical cloud. The McLaughlin Memorial Hospital is within the evacuation zone, and requires extra help in moving patients to the High School and the Shopping Mall. EMS is working with the municipal government, volunteer agencies and the hospital to evacuate to safety.

The municipal authorities contact the Province, who immediately sends additional resources to set up temporary decontamination sites as well as police officers to begin enforcing an evacuation zone. The province also contacts the National military, who announce they will arrive on Thursday morning. Some resources may be there as early as Wednesday, including temporary shelters, decontamination supplies and personnel to assist.

Monday 6:00 pm
The municipal government creates an evacuation message, however, the GapTV studios, which contain the local broadcast tower, are also inside the evacuation zone, making local radio and television transmissions impossible. A remote news van is used to videotape the information, and send it to the national networks. The internet is rapidly becoming the most used source for local information.

The local authorities seek to calm the people, explaining that contamination through the air is far less toxic than direct contact. Equally they prescribe home decontamination procedures.

"At temperatures above 7.6° C it is most likely that exposure will be solely to phosgene vapor, a more harmless exposure than direct contact with the chemical. If there is no evidence of exposure to liquid phosgene, decontamination simply requires removing the victim from the contaminated area and removing outer clothing which should be bagged and disposed of. Soapy water should be used to clean the skin using a rinse, towel off, repeat process if liquid has been observed. Hair should be thoroughly cleaned using soap and water, with care being taken to prevent wash water from contacting eyes."

The local authorities also outline the evacuation zone, an 11 kilometer radius around the toxic cloud. This takes up over one third of the city, a devastatingly large area, which includes many of the city's key infrastructures such as public transit and the bank.

Monday 9:30 pm
Evacuations are still moving slowly and mostly on foot. The toxic cloud ran very close along the entire north-south GapTransit monorail line, and the Main Street terminal,

effectively shutting down public transportation. Authorities need to wear respirators and gown and gloves, as they go door to door asking residents to leave the affected area.

Tuesday 4:30 am
The evacuation zone is declared officially cleared of residents. Those most seriously affected were carried on stretchers to decontamination and treatment centers. Exertion increases the reaction within the lungs, so even ambulatory patients need to be carried if possible. With the more urgent message being delivered from the National authorities, many of those who could have performed a home decontamination arrive at the treatment sites.

Tuesday 9:00 am
Almost a day later at the site of the train derailment, rescue workers have retrieved the last of the victims. It is becoming obvious that the leaking chemical cars have contaminated the river, which runs beside the tracks. The river provides the city's local water supply. It also is the watershed for a large portion of the province. The federal government is contacted, and they send in environmental experts to assess the damage being done to the city and province's water supply, and air quality.

Tuesday 9:15 am
National and provincial authorities prepare a press release of their own. A state of emergency is declared for the province.

"*For those responders in the area, complete chemical protective ensembles should be worn to ensure protection. Self-contained breathing apparatus is required for all on-site personnel. Volunteers should not enter the evacuation zone. All residents in the affected zone are to evacuate uphill and upwind without moving through the agent cloud. A list of shelters and decontamination / treatment sites are available. It is recommended you seek treatment if you experience shortness of breath, or a burning of the eyes or mouth. Water contaminated by HCl poses potential hazards, and clean up of this spill may be extensive. Do not drink any tap water. Use bottled water only.*"

INJECT – Task #1

Wednesday 10:00 am
Evacuation centers are full, and the military has arrived to help with the displaced individuals, setting up shelters, medical stations, and distributing food and water supplied through volunteer organizations throughout the province.

The federal environmental team conducted preliminary analysis, and are disheartened with the results. With the contents of all six cars drained into the water supply, and the toxic cloud hovering above the city' downtown core, water, land and air are all affected. With two days of exposure, there are many surfaces in the evacuation zone that are contaminated, including public parks, businesses, schools, and homes.

With the continuation of the heat wave, with a third day above 33° C, the situation is dire. Air quality is poor, and heat exposure is also becoming an issue. Pregnant women, the elderly and children are all at high-risk for adverse effects.

Wednesday 11:00 am
Wednesday morning the city is reeling from the upset of evacuation, and the uncertainty surrounding the chemical leak. Carbonyl Chloride will leave residual effects, but the degree of contamination is uncertain. The public has questions: How much Carbonyl Chloride entered the River, the city's water supply? How much is deposited on surfaces? Are our children safe? Have we already been contaminated? When can we go home? Equally there are elderly and those with mobility restrictions that have been unable to evacuate, and finding and helping these citizens is becoming the priority, as over 200 people have already fallen seriously ill, and there appears to be over 15 first responders with potentially fatal exposure.

The internet chatter on all social networking sites contains both accurate and inaccurate information. Many people are upset at the dispersion, with many family members stuck on either side of the toxic cloud. Rumours regarding the toxic nature of the tap water stop people from using it to decontaminate themselves as they believe this increases the risk of exposure through surface contact.

Wednesday 12:00 pm
Parents are increasingly concerned about the latent effects of the phosgene on surfaces. Equally, with many of the schools closed, there are significant interruptions for education and workplace productivity. It has been reported that over 55 hospital patients have passed away, due to either exposure to the chemical exposure, or through the evacuation process. There are now 86 confirmed fatalities and over 450 seriously ill.

Thursday 7:30 pm
Many of the first responders and health care workers are becoming ill after prolonged exposure to contaminated patients. Police, fire and EMS have been working at maximum capacity for three days, and many are falling ill with respiratory difficulties.

Friday 8:00 am
Overnight the temperature broke, with a violent thunderstorm, high winds and heavy rains. After four days apart from loved ones, people are getting anxious to return to “normal”. Despite the continued enforcement of the evacuation zone, many people are surreptitiously entering their homes and businesses, to collect personal belongings. Some are crossing the evacuation zone to reach loved ones on the other side of the chemical cloud. A number of people have been arrested in order to maintain the evacuation order; this creates a serious public protest about heavy handed police authority.

Friday 12:00 pm
Authorities are quick to release an announcement regarding the change in weather conditions and how that impacts the evacuation zone. People are asked to stay out for another two days. Compliance is becoming an issue. Internet chatter displays a public mistrust in the authorities, and a frustration at being displaced for so long. Many who have successfully entered or crossed the toxic area are reporting no ill effects, which is causing more and more people to attempt to enter the evacuation zone.

Task #2

M.10 Scenario Assessment Guide: Scenario Assessment Questionnaire – Train Derailment Scenario

This form is designed to capture a reader's understanding of what contributes to the complexity of a given scenario. Potential contributions to complexity for a scenario are described below in terms of impact, uncertainty and vulnerability, with specific challenges or areas noted for each. After reading the scenario, the reviewer is asked to rate the degree to which each challenge was evident in the scenario. The results will be compared with data collected from other reviewers to select a suitably complex scenario for use in a simulation exercise.

Q1 Overall, which of the following descriptors best describes the scenario?

- ☐ Simple
- ☐ Complicated
- ☐ Complex

Please rate the extent to which each of the following challenges is evident in the scenario. Use the scale ranging from 0 (not at all evident) to 4 (strongly evident).

		0	1	2	3	4
	Impact					
Q2	Impact severity *(i.e., number of fatalities /casualties, amount of physical damage/ psychological trauma, degree of social disruption/multiple events)*					
Q3	Impact scope *(i.e., breadth of impact on people, services, structures, societal functions)*					
Q4	Impact timing *(i.e., no threat/warning phase, sudden onset, sustained duration, and/or recurring event)*					
Q5	Media involvement *(i.e., extensive media coverage, lack of access to official sources, inappropriate use of social media tools)*					
Q6	Political processes *(i.e., multiple organizations involved, multiple jurisdictions, and/or multiple levels of government, public fear and/or mistrust in officials)*					
	Uncertainty					

		0	1	2	3	4
Q7	Novelty of situation *(i.e., novel hazard, malicious cause, lack of experience, lack of controllability, and/or latent impacts)*					
Q8	Anticipation and planning *(i.e., lack of planning, rehearsal, and sharing of plans, and/or lack of integration of plans)*					
Q9	Data and information *(i.e., lack of access to information, inaccurate information, lack of credible information sources, excessive volume of data, and/or fast speed of information flow)*					
Q10	New organizations and partners *(i.e., presence of non-traditional organizations and partners, and/or presence of emergent organizations or ad-hoc groups that self-organize to fill perceived resource gaps)*					
Q11	Changing context *(i.e., big changes in situation context, fast speed of change, actual/perceived negative consequences of change, and/or negative impacts of intervention (negative secondary effects)*					
Q12	Flexibility of interpretive frameworks *(i.e., imposed/unilateral processes, lack of common/shared processes, and/or lack of creativity/improvisation)*					
	Vulnerability					
Q13	Economic development *(i.e., lack of resources, lack of economic diversity, unequal distribution of wealth, and/or economic instability)*					
Q14	Social capital *(i.e., large number of at-risk populations, lack of social support, poor citizen participation in volunteering and decision making, poor sense of community, and/or excessive/insufficient attachment to place)*					
Q15	Community competence *(i.e., political instability, poor leadership skills, low literacy and education levels, lack of experience with similar hazards, and/or lack of community partnerships and support)*					

		0	1	2	3	4
Q16	Information and communication *(i.e., unreliable or excessive amounts of extraneous information, public opinion ignored, lack of trusted media spokesperson, ineffective risk messaging, and/or poor communication infrastructure capabilities)*					
Q17	Other infrastructure *(i.e., high degree of interdependence among critical systems, lack of redundant or backup systems, and/or weak or blocked distribution networks)*					

Q18 In your estimation, which of the following factors contributed most to the level of complexity in the scenario? Please check one box and explain your choice.

- ☐ Impact
- ☐ Uncertainty
- ☐ Vulnerability
- ☐ All of the above (factors influenced the assessment equally)

Please explain why:

Please rate the overall level of complexity of the scenario on a scale of 0 (not at all complex) to 4 (very complex).

		0	1	2	3	4
Q19	Overall, I would describe the level of complexity for the scenario as:					

Please rate your level of agreement with the following statements on a scale of 0 (strongly disagree) to 4 (strongly agree).

		0	1	2	3	4
Q20	The first part of the scenario is realistic / plausible.					
Q21	The second part of the scenario is realistic / plausible.					
Q22	The timeline for the scenario is realistic / plausible.					

Annex N Decision Quality Rating Instrument

Decision Quality Rating Questionnaire

Decision Quality Rating						
Please rate the extent to which the decisions reflect the following items on a scale of 0 to 4 (0 – to a very small extent; 1 – to a small extent; 2 – somewhat; 3 – to a great extent; 4 – to a very great extent).						
		To a very small extent 0	To a small extent 1	Somewhat 2	To a great extent 3	To a very great extent 4
Q1	The decisions reflect multiple perspectives from within the pod	○	○	○	○	○
Q2	The decisions reflect multiple perspectives from outside the pod	○	○	○	○	○
Q3	The decisions reflect innovative/creative characteristics	○	○	○	○	○
Q4	The decisions reflect a unified, cohesive approach	○	○	○	○	○
Q5	The decisions reflect shared information	○	○	○	○	○
Q6	The decisions reflect shared resources	○	○	○	○	○
Q7	The decisions reflect shared activities	○	○	○	○	○
Q8	The decisions reflect shared power/authority	○	○	○	○	○
Q9	The decisions have significant operational gaps or challenges	○	○	○	○	○
Q10	The decisions have significant strategic gaps/challenges	○	○	○	○	○

Please rate your level of agreement with the following statements on a scale of 0 to 4 (0 – strongly disagree; 1 – disagree; 2 – neutral; 3 – agree; 4 – strongly agree).

		Strongly disagree 0	Disagree 1	Neutral 2	Agree 3	Strongly agree 4
Q11	The pod considered the impacts of the event on multiple tiers (first tier is the direct damages to victims and infrastructure; second tier is the impact on core services; and third tier is the impact of an event on trust, order of civil society, and social fabric).	○	○	○	○	○
Q12	The pod considered the impacts that implementing solutions would have on multiple tiers (first tier is the direct damages to victims and infrastructure; second tier is the impact on core services; and third tier is the impact of an event on trust, order of civil society, and social fabric).	○	○	○	○	○
Q13	The pod considered the psychosocial implications of the event.	○	○	○	○	○
Q14	The pod considered the psychosocial implications that implementing solutions would have on the population.	○	○	○	○	○
Q15	The pod considered general resource constraints and availability in the decision making process.	○	○	○	○	○
Q16	The pod considered whether or not specialized resources would be required to implement solutions.	○	○	○	○	○
Q17	The pod considered the time requirements that solutions would require to be implemented.	○	○	○	○	○
Q18	Considering the time and resources available, the pod's decisions were good overall.	○	○	○	○	○

Annex O PODS Participant Workbook Materials

Briefing Information

During the course of this experiment a facilitator will be on hand. The facilitator will conduct a debriefing following the experiment. Participation in this experiment is voluntary.

As a participant, you will be immersed in a fictional scenario, asked to complete two tasks, and asked to complete a series of questionnaires. These questionnaires will ask questions about your background in the field of emergency response, your experience working on the two tasks, and on how you interpreted the events in the scenario.

While the events in the scenario are fictional, certain aspects of this experiment will be realistic. Tasks will have time limitations, and the scenario will continue whether the task is completed or not. Please ensure that you take the time to fill out all questionnaires.

Participant Profile Instructions

Your role within the experiment will be based upon your experience in emergency response. During the course of the experiment, please consider yourself as having been relocated to Gapville, where your job resembles your current occupation with respect to authority, power, role and responsibilities. You will be performing the same duties that you are usually responsible for. If you are retired, please imagine that you are occupying your former job, in the city of Gapville, and that you have come out of retirement for the course of the experiment.

Gapville Profile

Located in the Province of Anticipate, in the Country of Reframe, between Ripple River and the Lemyre Mountain Range is Gapville. The city is only 80 km from the Provincial Capital, and is only 20km away from the national border to the south. Gapville is a growing city with a population of 205,000 with all the built and social infrastructures found in a medium sized North American city. For Example, the Gapville Dam and Hydro Electric station provides power to the entire town and the GAPTransit Commission runs a Light Rail system and bus routes.

In recent years Gapville's Hi-Tech sector has expanded, creating an influx of immigration. The leading technology company, P-RAM Communications employs over one quarter of the community. Tourism is another large industry, thanks in part to the creation of the P-RAM Pavillion built in 2004. This corporate-sponsored center draws tourists from all across Anticipate and the Baseball Stadium is home to the Gapville Hazards.

Municipal and Provincial services are located in the Anticipate Building, beside the courthouse. The Gapville Police Force and the Fire Department each have two divisions across the city. The

University of Gapville is a fully accredited and well respected institution, as is the McLaughlin Memorial Hospital which houses an excellent pre and post-natal facility – Claire's Hope.

This center of excellence draws patients from all across Reframe. Gapville's original entertainment district contains the renowned Corneil Museum of Natural History and the Old Town Historical Theatre. Gapville has a multi-faith population and provides several churches of different denominations along with a mosque and Buddhist temple. Social infrastructure includes outreach centers, social clubs, and neighbourhood watch.

Gapville in Depth

Please use this table for reference throughout the course of the experiment on an as needed basis.

Total Population	• 205,000 residents
Geography	• In the province of Anticipate • In the country of Reframe • 80 km from the Provincial Capital • 20km away from the national border to the south • Located in a valley, 600 feet below sea level • Ripple River is located to the North West • Lemyre Mountain range is located to the North East • North temperate zone: o Forest fires are prevalent in the autumn o Floods in the rainy spring season are an annual issue o Ice storms in the winter time are common in valley areas
Utilities	• The Ripple River Dam and Hydro electric station; buried power lines throughout the city • Natural gas piped into Gapville from major urban center, Primerton, 20 kilometres away • Ripple River provides water supply directly into the town
Telecommunications	• GAPtv Head office • Broadcast tower serves: o The local media outlet, GAPtv o The Provincial public broadcast service AnticipateTV o 2 local radio stations o Telephone o Wireless Internet o Cellular Telephone Tower
Transportation	• Freight and passenger railway, along the Reframe National Rail Line • Gapville Domestic airport serves Reframe National and provincial air carriers • The Airport also provides charter flights and pilot training • Interprovincial Expressway serves 150,000 cars and trucks daily from Primerton to Response with 2 on and off ramps in downtown core • GAPTransit (GT) Public Transit Main Street Terminal Central Hub o GT light rail / GT bus routes

Government	• Anticipate Provincial and Reframe Municipal Building • Gapville Courthouse • Post office
Security	• Gapville Fire Department: 2 divisions, 2 others in the rural areas • Gapville Police Department: 2 divisions downtown • Medium Security Prison
Health	• McLaughlin Memorial Hospital: o Claire's Hope Pre and Post Natal Care Unit • Center-town Drop-In Clinic
Financial	• Reframe National Bank Service branch • 4 ATMs throughout town
Social Services	• Johnson Estates Community Center: o Child care facility o Library o Track and field facility o Swimming pool • South-End food bank and outreach center
Industry	• Forestry, processing and distribution of raw timber across the country in Industrial Park • Riding Dairy and Vegetable Farm, shipping locally and provincially • Johnson Estates golf and country club service • Johnson Estates home construction industry • Hi-tech Sector, largest employer: P-RAM Communications
Communities	• Johnson Estates • Desmarais Heights • Center-town • Retirement living facility also runs a meal delivery service
Tourism	• P-ram pavilion, corporate sponsored center includes: o Theatre, including standing room for up to 25,000 o Indoor parking for 2100 o Kid's Village o Horse racing • 4 Airport area hotels can accommodate over 3000 guests each for a total of 12,000 visitor occupancy at any time
Retail Market	• Ripple River Shopping Mall • Center-town markets & cafes • Asian Market • Little Italy

Education	• 2 Elementary schools • 1 High School • University of Gapville

Sports and Recreation	• Pinsent Park
	• Baseball Stadium:
	  o Gapville Hazards Baseball Team draws 19,800 people on game night
	  o Underground parking for 1500
	• Hiking / Skiing in the Lemyre Mountain Range

Arts and Entertainment	• Old Towne Movie Theatre • Corneil Museum of Natural History • Sociale Nightclub • Anticipate Art Gallery
Religious Services	• 1 Catholic Cathedral • 1 Protestant Church • 1 Buddhist Temple • 1 Muslim Mosque

Volunteer Services	• Meals with Wheels
	• Neighbourhood Watch
	• Helping Hand Immigration Center run out of the Mosque providing:
	  o Translation services
	  o Employment help

Social Clubs	• Johnson Estates Private Country Club • Transportation Worker's Club • Boy and Girls Club of Reframe • Italian Club • Gapville Juniors AAA Baseball League • Tai Chi Society, run out of the Temple, and using Pinsent Park

Situation Report #1

Incident Number: RD001-11
Incident: Radiological Bomb at the SSMD Warehouse
Date: Information valid as of Tuesday, 15th October, 17:50 hours (EST)
Description of current incident: At around 15:50, Monday October 14th, a package exploded in the loading bay at the Sort & Send Mail Delivery (SSMD) warehouse. The explosion was from a dirty bomb, originally intended for the GAPTV television station, and it has now spread several ounces of radioactive Cesium 137 dust in the southern industrial sector of the city. The contaminated areas include the South End LRT station and the International Borders and Customs warehouse. The source of this attack and the motives behind it are unknown at this time.

Source(s) of reporting: Original source of reporting from responders on site, and GapTV Broadcasts.

Current actions in response: Provincial HazMat teams were first on site after the local responders, and are conducting investigations at this moment, with the help of municipal responders. Public Safety and Emergency Preparedness is the primary federal department for this incident, including public communications until otherwise advised.

Federal Police, the Security Intelligence Services and the National CBRN team are clearing the contamination, tracking down all the potential victims of radiation exposure, and evacuating areas determined to be in a "hot zone". The Department of Defence, the Military and the National Health Agency are all working on-site at the EOC.

Assessment/Analysis:
Seventeen people are wounded, and the six closest to the explosion are critically ill. Some of the victims of the flying glass and debris show signs of mild to moderate radiation exposure. Apparently the radiation sickness is worse if the victim has open wounds. There is also considerable concern around pregnant women and children, as they are the most seriously affected by the long term effects of radiation.

The 6 critically ill warehouse workers were taken to the McLaughlin Memorial Hospital by ambulance.
These causalities contaminated the Hospital's emergency room, and some of the patients and health care workers who were in the ER at the time.

The Hospital has called a code brown for hazardous materials. The Hospital also has activated a Memorandum of Understanding with the local pulp and paper mills to use their chemical protection equipment, and self contained breathing apparati.

After the 4pm shift change at the Hospital, some contaminated health care workers went out in public unknowingly spreading radiation carried on their skin and clothing. The contaminated ambulances also went back out on call before they could be notified of their radiation exposure. Infantry along with military medics are assisting the overrun at McLaughlin Memorial Hospital

with moving critical patients to auxiliary treatment centers at the walk-in clinic and the Golden Acres assisted living home.

The international press arrived around 10pm Monday evening in Gapville at the same time as representatives from NATO, the United Nations and the International Atomic Energy Agency.

Contamination travelled on the light rail train and went through the downtown core, the university campus, Little Italy, some parts of the northern industrial park and the airport.

Provincial Parks and Recreation are now working with Police, GAPTransit, Airport Authorities and the Transportation Safety Board to keep traffic flowing, and to assist in the shelter and support for all those who have arrived, and for all those who have been displaced.

Transportation Safety Board has agents at the Gapville Domestic Airport. They report elevated readings at the airport that could be related to either naturally occurring radon, or from possibly more malicious sources. Security Intelligence Services have arrived at the airport and have begun to shut down the terminal.

Additional notifications: All the buildings in a 2 kilometre radius of the explosion have been evacuated. This includes the massive international Borders and Customs warehouse, as well as the LRT South End station, and two high rises; one is an apartment building, the other an office tower.

Due to the issues at the Customs warehouse, the Border Services Agency has been notified, as well as the Department of International Affairs.

The Transportation Safety Board and Airport Authority are working with the Security Intelligence Service right now to evacuate the terminal and are redirecting commercial air traffic to the provincial capital of Primerton.

Municipal transit services have also been halted for now, until we can track down all the potentially exposed victims, and all areas of the city that have unacceptable levels of radiation.

90 prisoners at the Medium Security penitentiary who were outside in the exercise yard at the time of the explosion may have been exposed to radiation as well. Correctional Services have been notified.

Issued by: Gapville Unified Coordination Centre
Email/courriel: GOC @Gapville.CA Tel.: (100) 555-7000 Fax/Télécopieur: (100) 555-0999

Public Health Agency Press Release Inject

Public Health Agency
GapVille

PRESS RELEASE

One Thousand, Three Hundred and Twenty (1320) people have arrived at the examination centers set up in the hospital parking lot. The six (6) Sort & Send warehouse employees who were nearest to the explosion are all critically ill. The paramedics and the initial ER staff who treated the warehouse employees were also exposed to moderate levels of radiation and have fallen ill.

The seven (7) GapTransit victims are in stable condition, as are the customs warehouse workers, and the unprotected fire fighters, EMS and police officers originally at the scene. Their symptoms may not appear for another day or so, but their long-term cancer risks are high.

Eighty-two (82) other people have been hospitalized and quarantined for treatment of sub-lethal but serious effects of radiation exposure; another one-hundred and sixty five (165) are following out-patient treatments. Many of the workers who left the site after the explosion have been tracked down or have arrived at the hospital.

Thirty percent (30%) of hospital staff is working overtime, dealing with the influx of patients, coupled with the loss of employees who have been exposed to radiation. There have been seven (7) confirmed radiation exposure cases, amongst the health care workers.

Family members for some of the responders and workers have been found to have varying levels of exposure as a result of the contaminated clothing brought home. Potentially exposed children and pregnant women are now the focus of intensive surveillance and monitoring.

The hospital officially request support from the military's engineers and medical unit to set up an emergency field hospital. Additionally, the hospital requests that Military Medics take care of the prisoners who were exposed, as they are currently at the end of their resources at the emergency treatment center. NGO's and Volunteer agencies are ready to offer aid, but do not have the appropriate protective gear to access the hot zones. More resources will need to be reallocated to the management of volunteers, for their own safety. Memos of Understanding (MOU's) have been activated with the Pulp and Paper mills, for their chemical protective gear. These are being dispersed to the responders. The Gapville Red Cross have sent workers in droplet protection suits to the quarantine centers, to donate clothing to those who have to submit theirs for incineration, and to usher the public through triage at the field hospital.

Situation Report #2

Incident Number: RD001-11
Incident: Radiological Bomb at the SSMD Warehouse
Date: Information valid as of Wednesday, 16th October, 18:00 hours (EST)
Description of current incident: At around 15:50 pm, Monday the 14th of October, a package exploded in the loading bay at the Sort & Send Mail Delivery (SSMD) warehouse. The explosion was from a dirty bomb, originally intended for the GAPTV television station, and it spread several ounces of radioactive Cesium 137 dust in the southern industrial sector of the city.

The location where the bomb was produced has been identified and additional areas in the city have been exposed to contamination. Evacuation and containment activities are being taken by police assisted by military personnel. Large numbers of people have left the city while the movement of the majority of the population has been restricted to ensure public safety as every attempt is being made to determine if there are additional exposures.

Source(s) of reporting: Original source of reporting from Responders on Site, and GapTV Broadcasts.

Current actions in response: The federal presence and the military arrived following the implementation of the National Emergency Plan following a request by the province and the municipality. Since that time, additional national and international resources have been arriving across the city.

The priority continues to be concentrating on public safety and containment of sites. Local police with the military assisting them in providing security at the prison on the exterior as well as at the perimeter of various contaminated sites.

The military will continue to assist the hazmat teams and the forensic investigators in doing a city wide assessment to detect any additional sites and if discovered they will provide additional security to prevent people from further exposure. The current taskings for all national groups will be centred on security and providing humanitarian assistance under the direction of local authorities.

Assessment/Analysis:
SIS agents identified those responsible for the attack and where they assembled the bomb. The perpetrators used a suburban house in Gapville's upscale neighbourhood, the Johnson's Estates. Radiation levels there are moderate to high.

There are at least 20 houses that will need to be decontaminated or destroyed. The Fire Department is working with HazMat and the CBRN Team right now, evacuating the Johnson's Estates. They are conducting a door to door canvas in the affected areas to ensure residents have evacuated.

There is concern that the perpetrators possibly contaminated themselves during the bomb assembly, and may be spreading the contamination as they travel.

This would explain the unusually high radiation readings found at the Gapville airport.

The south-eastern section of the city is still closed off, with the south end highway exit shut down. Some bus routes are still running, but the Light Rail is still shut down. Police are asking that citizens do not cross the hot zone barriers

The municipal, provincial and federal teams have taken a variety of actions intended to restore public safety and confidence. Overnight, the fire stations that went to the fire have been closed and their equipment and vehicles are being decontaminated. The ambulances, the hospital emergency room and the rooms where the patients were handled are also being decontaminated.

The city has set up a social media site, with Facebook and Twitter feeds, as well as the Ministry of Resources radiation plume maps.

The Red Cross and other volunteers groups have set up temporary schools and daycares for all the children who cannot attend classes today at the Johnson Public School.

There is a concern that residents and business owners are attempting to return to their properties to protect them as rumours and media reports lead them to believe there has been looting in the city. This is placing additional strain on those who are trying to maintain the security and safety perimeters.

Additional notifications:

The Department of Foreign Affairs is also working with investigators over the international contamination issues.

Long term environmental impact assessments are being requested.

Issued by: Gapville Unified Command Centre
Email/courriel: GOC @Gapville.CA Tel.: (100) 555-7000 Fax/Télécopieur: (100) 555-0999

Facebook Posts Inject


facebook
Search
Public Health Agency
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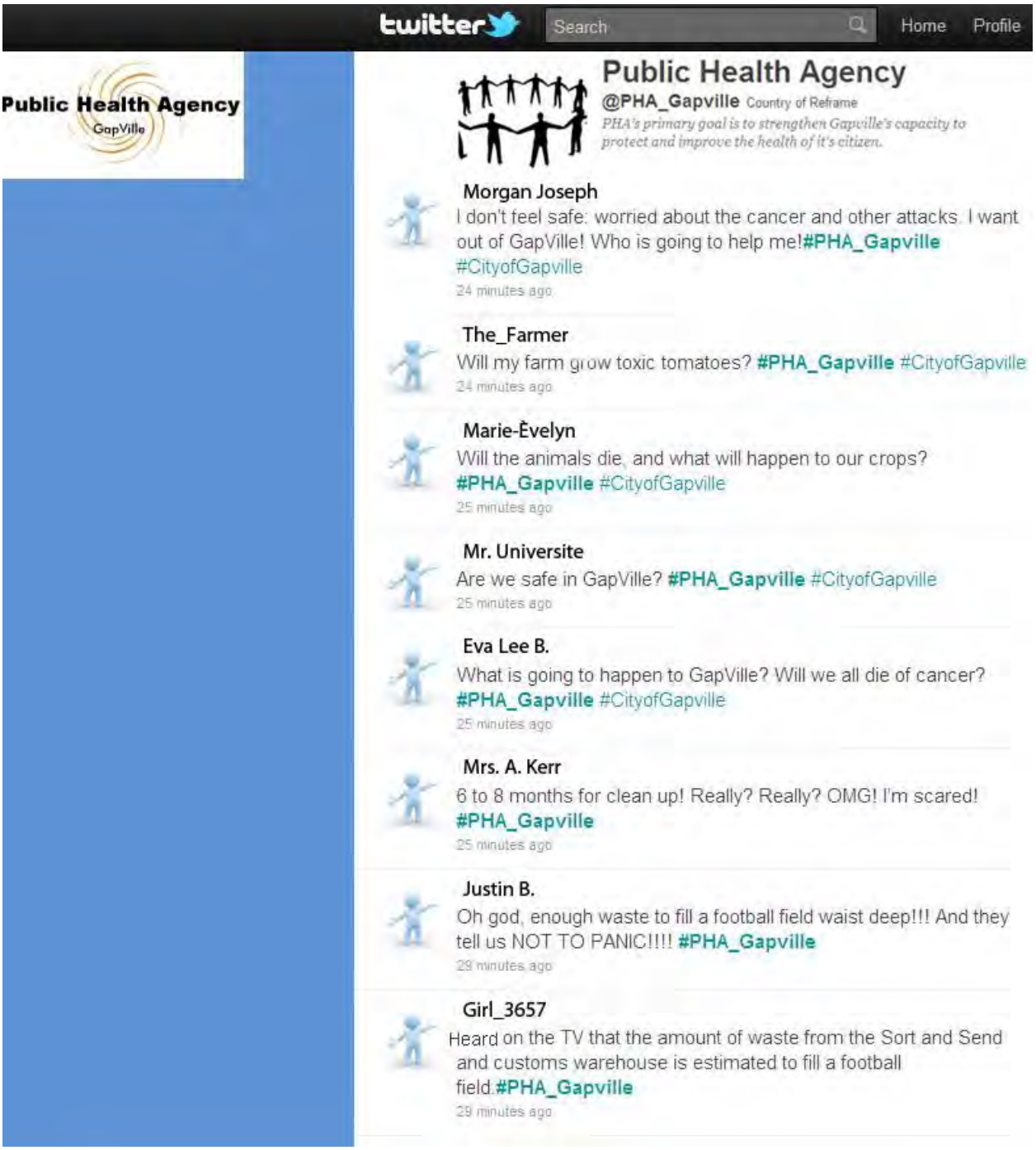
Public Health Agency of Gapville
Wall
Info
Photos
Discussions
Write something...
Attach:
Share
Suggest to Friends
Subscribe via SMS
PHA, stengthening GapVille capacity to protect and improve the health of it's citizen.
2 People Like This
Emmanuel
Gap Ville
Unlike
Create a Page
Report Page
Share
Public Health Agency of Gapville + Others
Just Public Health Agency of Gapville
Just Others
Roberto L. Martinez
Are the animals on my farm going to be ok?
2 seconds ago · Like · Comment
Marie-Patricia Dorion
What are the risks for children and pregnant women, I'm 37 weeks now??? Is my baby safe?
a few seconds ago · Like · Comment
Gabrielle John-Levis
Should I be scared of dying of cancer?
a few seconds ago · Like · Comment
Annabelle Demers
6 to 8 months for clean up! And up to 10 blocks around each of the different sites!!!
about a minute ago · Like · Comment
Matthew Gibson
Heard on the TV that the amount of waste from the Sort and Send and customs warehouse is estimated to fill a football field waist deep
2 minutes ago · Like · Comment
Marcel P. Robert
Please PHA give us more information on the health risks for our community. I'm really worried for myself and my children!
2 minutes ago · Like · Comment
Isabelle Martin
GapGreen is opposing the transportation of the waste along city streets to the permanent diposal site. They think this is too dangerous! I agree.
2 minutes ago · Like · Comment
Wendi G. Chen
People close to the bomb show moderate to severe radiation? Will they die?
21 minutes ago · Like · Comment
Public Health Agency of Gapville
Please visit our facebook page for more information.
23 hours ago · Like · Comment

Twitter Feed Inject



Debriefing

Thank you for taking part in the scenario. Please join the other pod members for a debriefing session in the plenary room. Feel free to ask the facilitator any questions that you might have. Please hand in your binder and questionnaires to a staff member in the plenary room.

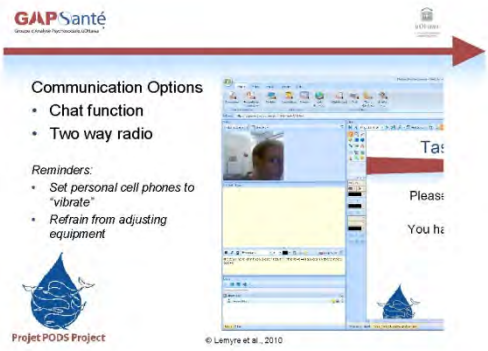
During the debriefing session you will be asked to fill out an additional questionnaire about how you interpreted the events in the scenario.

If you would like to discuss the scenario further, please contact us at GAP-Santé.

Louise Lemyre
Professor, School of Psychology
Faculty of Social Sciences
University of Ottawa
Tel: 613-562-5800 (ext 1196)
llemyre@uottawa.ca
Gap-Santé
Tel: (613) 562-5800, ext. 2321
Fax: (613) 562-5350
gapsante@uottawa.ca

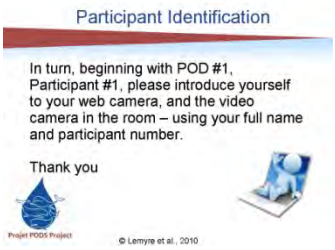
Annex P Inter-GAP In Vivo Session Materials

P.1 Briefing Slide Deck

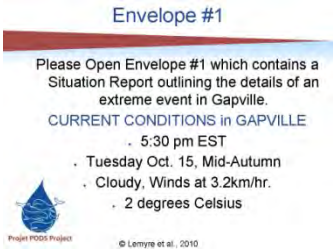
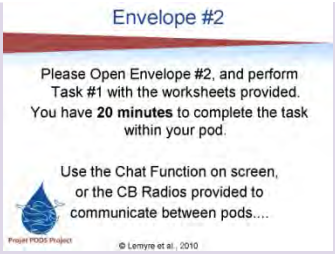


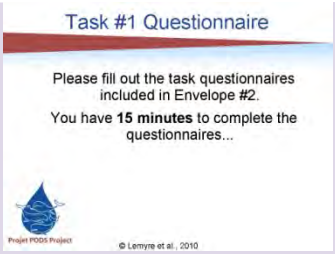
P.2 Controller Script

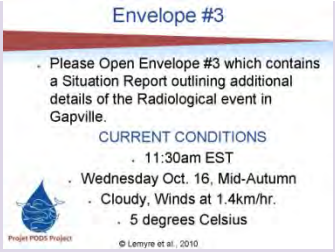
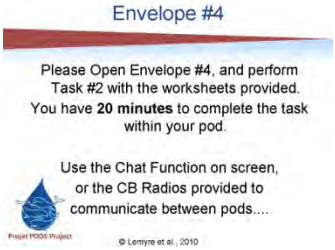
CONTROLLER OPEN

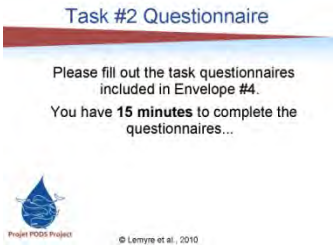
Time & Slide	Activity	Duties
07:30 – 09:00 	Setup	• **TECHNICAL:** • Plug in headset • Start Nefsis Conference • Ensure all sound and video is functioning properly • **REMEMBER*** • From now on, control mute through the headset, not the software. • **MEDIA:** • Pre-load all media in THIS order: • PODS Flow 2feb2011. ppt • PODS Scenario Part 1.wmv • PODS Scenario Part 2.wmv • PODS Scenario Open Comm1.wmv • PODS Scenario Part 3.wmv • PODS Scenario Youtube.wmv • PODS Scenario Open Comm2.wmv • **POWER POINT:** • Begin with Flow Slide #1 Waiting on Screen.... Ensure the Annotation function is deselected. • **LAYOUT:** • Select Follow my Layout • Select Style 1
09:00 	Welcome	• **TECHNICAL:** • Begin Nefsis Recording, GO TO: top left icon; record conference; • Use .avi codec and save to desktop. • **REMEMBER*** • Record Actual Desktop. Enable audio for participant introduction. • **VOICE OVER:** • "Good Morning PODS, can you please introduce yourselves to the camera, with

your name and participant number, starting with you POD one…."

		Briefing	• **TECHNICAL:** • Mute Controller Headset • GO TO: Audio; Mute All • **POWER POINT:** • Move to **Flow Slide #3** – leave on screen for 30 seconds. • **VOICE OVER:** • Before the video: "Feel free to use the color map of Gapville for reference, and you have a black and white copy provided in your binder, that you may draw and write on as well." • **MEDIA**: • GO TO: Layout; Share Only; Full Screen • Inside the MEDIA PLAYER, select "Fit in View" and turn down the media player volume to about 1/3 • Play the **Gapville Intro**
09:10		Deliver Scenario (1st Half)	**POWER POINT:** • Advance to **Flow Slide #4** • Keep on screen for 30 seconds. • **MEDIA:** • Play VIDEO: PODS Scenario Part 1 • Play VIDEO: PODS Scenario Part 2
09:20 – 09:40		Begin Task 1	• **TECHNICAL:** • RIGHT CLICK on all the POD rooms in the user list. GO TO: Audio Settings • Adjust POD Speakers to 0 • Ensure POD Microphone is still set at 90 • **POWER POINT:** • Advance to **Flow Slide #5**, keep on screen. • **LAYOUT:** • GO TO: Share; Chat; Chat with all users

			• GO TO: Layout; Style 1; Fullscreen • **VOICE OVER:** • "I want to remind Participants of the two-way radios and highlight the chat function on the right side of the screen…" • Enter "Hello" in the chat box as an example. • Allow Participants 20 Minutes to complete the task. Inform participants of their time remaining, at 10 minutes, and 5 minutes.
09:40 – 10:15		Begin EOC Conference	• **POWER POINT:** • Advance to **Flow Slide #6** • **MEDIA:** • Play VIDEO: PODS Sit Rep Open Comm1 • **LAYOUT:** • Save Chat file to Desktop as chat_date.rtf • GO TO: Layout; Video Only; Fullscreen • **TECHNICAL:** • Unmute All Audio **VOICE OVER:** • "You should now be able to hear each other. You have 35 minutes to complete the task." • Remind participants of time remaining, at 20, 10 and 5 minutes.
10:15 – 10:30		Task 1 Questionnaire	• **LAYOUT:** • Exit Fullscreen to access layout panel. • GO TO: Layout; Style 1; Fullscreen • **POWER POINT:** • Advance to **Flow Slide #7** • **VOICE OVER:** • "Once you have finished your questionnaires we will have a short break. The experiment will resume at (10:50am)"

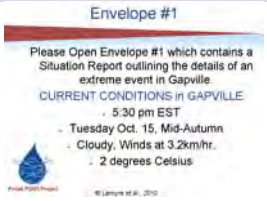
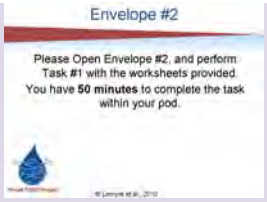
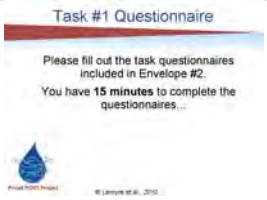
10:30 – 10:50		Break	• **POWER POINT:** • Advance to Flow Slide #8
10:50 – 11:00		Deliver Scenario (2nd Half)	• **POWER POINT:** • Advance to **Flow Slide #9** – leave on screen for 30 seconds. • **MEDIA:** • Play VIDEO: PODS Scenario Part 3 • Play VIDEO: PODS Scenario Part Youtube
11:00 – 11:20		Begin Task 2	• **TECHNICAL:** • Adjust all POD Speakers to 0 • Ensure POD Microphone set at 90 • **POWER POINT:** • Advance to **Flow Slide #10**, keep on screen. • **LAYOUT:** • Exit Fullscreen to access control panel. • GO TO: Layout; Style 1; Fullscreen • GO TO: Share; Chat; Chat with all users • **VOICE OVER:** • "Hello PODS, again I'd like to remind participants of the two-way radios and the chat function on the right of the screen." • Allow Participants 20 Minutes to complete the task. Inform participants of their time remaining, at 10 minutes, and 5 minutes.

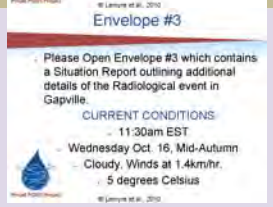
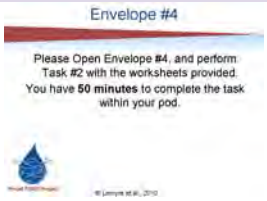
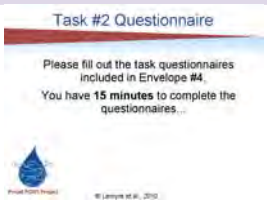
11:20 – 11:55		Begin EOC Conference	• **MEDIA:** • Play VIDEO: PODS Sit Rep Open Comm 2 • **LAYOUT:** • Exit fullscreen to access control panel. • Save Chat file to Desktop as chat_task2_date.rtf • End Chat Function • GO TO: Layout; Share Only; Fullscreen • **POWER POINT:** • Advance to **Flow Slide #11** • **VOICE OVER:** • "You should now be able to hear each other. You have 35 minutes to complete the task." • Remind participants of time remaining, at 20, 10 and 5 minutes. • **LAYOUT:** • Exit fullscreen to access control panel. • GO TO: Layout; Video Only; Fullscreen
11:55 – 12:10		Task 2 Questionnaire	• **POWER POINT:** • Advance to **Flow Slide #12** • **VOICE OVER:** • "Once you have finished your questionnaires we will have a debrief and lunch in the meeting room, (3120), where we had our initial briefing. Please bring your completed worksheets, questionnaires and binder back to the room with you."
12:10 – 12:15		Experiment ends	• **POWER POINT:** • Advance to **Flow Slide #13** • **TECHNICAL:** • Stop the Nefsis recording, and do NOTHING while it renders and saves onto

	the desktop. • Once all participants have left their pods GO TO: Icon in top left, and End Conference.

CONTROLLER CLOSED

Time & Slide		Activity	Duties
07:30 – 09:00		Setup	• **TECHNICAL:** • Plug in headset • Start Nefsis Conference • Ensure all sound and video is functioning properly • **REMEMBER*** • From now on, control mute through the headset, not the software. • **MEDIA:** • Pre-load all media in THIS order: • PODS Flow 2feb2011. ppt • PODS Scenario Part 1.wmv • PODS Scenario Part 2.wmv • PODS Scenario Open Comm1.wmv • PODS Scenario Part 3.wmv • PODS Scenario Youtube.wmv • PODS Scenario Open Comm2.wmv • **POWER POINT:** • Begin with **Flow Slide #1** Waiting on Screen.... Ensure the Annotation function is deselected. • **LAYOUT:** • Select Follow my Layout • Select Style 1
09:00		Welcome	• **POWER POINT:** • Go to **Flow Slide #2** • **VOICE OVER:** • Ask Participants to Introduce themselves on camera, with Participant ID Number
		Briefing	• **POWER POINT:** • Move to **Flow Slide #3** – leave on screen for 30 seconds. • **VOICE OVER:**

			• Before the video: “Feel free to use the color map of Gapville for reference, and you have a black and white copy provided in your binder, that you may draw and write on as well.” • **MEDIA:** • Inside the MEDIA PLAYER, select “Fit in View”. Turn down the media player volume to about 1/3 • Play the **Gapville Intro** video AFTER allowing 30 seconds of screen time for Slide #3
09:10		Deliver Scenario (1st Half)	• **POWER POINT:** • Advance to **Flow Slide #4** • **MEDIA:** • Play VIDEO: PODS Scenario Part 1 • Play VIDEO: PODS Scenario Part 2
09:20 – 10:10		Begin Task 1	• **POWER POINT:** • Advance to **Flow Slide #5**, keep on screen. • **VOICE OVER:** • Allow participants 50 minutes to complete the task. • Inform participants of their time remaining, at 10 minutes, and 5 minutes.
10:10 – 10:25		Task 1 Questionnaire	• **POWER POINT:** • Advance to **Flow Slide #6** • **VOICE OVER:** • “Once you have finished your questionnaires we will have a short break. The experiment will resume at (10:50am)”

10:25 – 10:50		Break	• **POWER POINT:** • Advance to **Flow Slide #7**
10:50 – 11:00		Deliver Scenario (2nd Half)	• **TECHNICAL:** • Wait for all participants to arrive back • **POWER POINT:** • Advance to **Flow Slide #8** • **MEDIA:** • Play VIDEO: PODS Scenario Part 3 • Play VIDEO: PODS Scenario Part Youtube
11:00 – 11:50		Begin Task 2	• **POWER POINT:** • Advance to **Flow Slide #9**, keep on screen. • **VOICE OVER:** • Allow Participants 50 Minutes to complete the task. • Inform participants of their time remaining, at 10 minutes, and 5 minutes.
11:50 – 12:10		Task 2 Questionnaire	• **POWER POINT:** • Advance to **Flow Slide #10** • **VOICE OVER:** • "Once you have finished your questionnaires we will have a debrief and lunch in the meeting room, (3120), where we had our initial briefing. Please bring your completed worksheets, questionnaires and binder back to the room with you.
12:10 – 12:15		Experiment ends	• **POWER POINT:** • Advance to **Flow Slide #11** • **TECHNICAL:** • Stop the Nefsis recording, and do NOTHING while it renders and saves onto the desktop.

- Once all participants have left their pods GO TO: Icon in top left, and End Conference.

P.3 Session Administration Information Form

Session Administration Information Form

Date (dd/mm/yyyy):		Session #:	
Session Type (check one):	○ 1 University of Ottawa Students ○ 2 Professional Students ○ 3 Senior Officials	Task Type (check one):	○ 1 Coordination ○ 2 Collaboration
	Pod Status:	# of Participants / Pod:	Pod Type:
Pod Number One:	○ 0 Not filled with participants ○ 1 Connected ○ 2 Closed	○ 0 None ○ 1 One ○ 2 Two ○ 3 Three	○ 0 Not Applicable ○ 1 Homogeneous ○ 2 Mixed
Pod Number Two:	○ 0 Not filled with participants ○ 1 Connected ○ 2 Closed	○ 0 None ○ 1 One ○ 2 Two ○ 3 Three	○ 0 Not Applicable ○ 1 Homogeneous ○ 2 Mixed

Pod Number Three:	○ 0 Not filled with participants ○ 1 Connected ○ 2 Closed	○ 0 None ○ 1 One ○ 2 Two ○ 3 Three	○ 0 Not Applicable ○ 1 Homogeneous ○ 2 Mixed
	Pod Status:	# of Participants / Pod:	Pod Type:
Pod Number Four:	○ 0 Not filled with participants ○ 1 Connected ○ 2 Closed	○ 0 None ○ 1 One ○ 2 Two ○ 3 Three	○ 0 Not Applicable ○ 1 Homogeneous ○ 2 Mixed
Scenario:		Location:	
Observer (initials):		Facilitator:	
Start Time / End Time (hh:mm):	: / :	Session duration (hh:mm):	:

P.4 Technical and Process Issues Form

Technical and Process Issues Form

Date (dd/mm/yyyy):			Session #:	
Audio Simulation Delivery Problem(s):	○1 Yes ○2 No	Nature of the problem:		
Video Simulation Delivery Problems(s):	○1 Yes ○2 No	Nature of the problem:		
Participant Audio Recording Problem(s):	○1 Yes ○2 No	Nature of the problem:		
Participant Video Recording Problems(s):	○1 Yes ○2 No	Nature of the problem:		
Inter-pod Communication Problem(s) due to Technology:	○1 Yes ○2 No	Nature of the problem:		

Conferencing Software Problem(s):	○1 Yes ○2 No	Nature of the problem:
Internet Connection Failure(s):	○1 Yes ○2 No	Nature of the problem:
Other Technical Issue(s):	○1 Yes ○2 No	Nature of the problem:
Participant(s) Absent:	○1 Yes ○2 No	Nature of the problem:
Participant(s) Late:	○1 Yes ○2 No	Nature of the problem:
Participant(s) Left Early:	○1 Yes ○2 No	Nature of the problem:
Consent Refusal(s):	○1 Yes ○2 No	Nature of the problem:
Delayed Start Time:	○1 Yes ○2 No	Nature of the problem:
Session Interruption(s):	○1 Yes ○2 No	Nature of the problem:

Participant(s) Confused by Directions:	○1 Yes ○2 No	Nature of the problem:
Participant(s) Confused by Software:	○1 Yes ○2 No	Nature of the problem:
Other Process Issue(s):	○1 Yes ○2 No	Nature of the problem:

Annex Q Recruitment Documents

Q.1 Student Recruitment Pool Posting

Study Information	
Study Name	Understanding Problem Solving and Decision Making
Description	Please arrive half an hour early (arrive at 8:30am)to be briefed on study procedures and experiment schedule. The session will take place in English and will last approximately three hours and will resemble a table-top exercise often used for emergency planning. The session will take place at the University of Ottawa from 9am-12pm. As a participant you will be asked to interact with other session participants as they work through the exercises. As well, you will be asked to complete various questionnaires on perceptions and opinions of tasks, performance and interactions. All sessions will be video and audio recorded for data collection purposes. All aspects of participation are voluntary. You will be asked to read through and sign a consent form indicating informed consent prior to participation in the session. **Pizza lunch will be included at 12:30pm
Prescreen Restrictions	No Restrictions - [**View/Modify Restrictions**]
Duration	180 minutes
Points	2 Points
Researcher	Hilary Kitchener Email: **hilary.kitchener@gmail.com**
Participant Sign-Up Deadline	24 hours before the study is to occur
Study Status	Visible to participants (approved) Active study (appears on list of available studies)
REB/Comité d'éthique Approval Code	08-10-31 (expires September 13, 2011)

Q.2 Participation Invitation Letter

Dear <insert name>,

I am inviting you to participate in a study at the University of Ottawa. Our research team has received your name from <insert reference>. Please see below for a brief description of our study. We believe that participants will find it an interesting experience.

Problem-solving and Organizational Decision-making Simulation (PODS) Project

Needed: Participants for an innovative simulation exercise on problem solving and decision making within the context of an extreme event. The research is being conducted by the University of Ottawa and funded by Defence Research and Development Canada (DRDC).

Purpose of the study: To examine how officials work together during emergencies which require joint responses from both traditional first responders (police, fire and EMS, public health) and non-traditional ones (social and community services, non-governmental organizations or volunteer groups) as well as from the military or other government agencies. The overall objective of the research is to identify ways to improve interoperability between organizations during a large scale emergency event or threat.

Who: Senior level emergency management practitioners with at least one year of experience with high-level decision-making in managing and responding to emergencies.

When: Session dates include:

February 23rd - Wednesday
February 24th – Thursday
February 25th – Friday
February 28th – Monday
March 1st – Tuesday
March 2nd – Wednesday
March 3rd – Thursday
March 23rd – Wednesday

Sessions will be held in the mornings between 8:30-12:30. A light lunch will be provided.

Where: Desmarais Hall, Room 3120, University of Ottawa (55 Laurier East, K1N 6N5)

What: During sessions, participants will be assigned to groups of three participants, called a "pod". These pods will be immersed in a table-top exercise, which is driven by a CBRNe scenario and situated in the fictional mid-sized city of “GAPVille”. The participants will work in small groups on a series of tasks to address particular aspects of the emergency. In some cases, participants will be communicating with the other pods with the aid of video-conferencing software. All aspects of participation are voluntary. You will be asked to read through and sign a consent form indicating informed consent prior to participation in the session.

Please contact Hilary Kitchener at gapsante@uottawa.ca or (613) 562-5800 x2321 to indicate your interest in participating. We will contact you to confirm arrangements.

Sincerely,
<insert name & signature>

Q.3 Phone Confirmation Script

Phone Confirmation Script

"Hello,

My name is **[first name of caller]**, I am calling from GAP-Santé regarding your participation in our Problem-solving and Organizational Decision-making Simulation (PODS) Project.

In order to meet the criteria for participation I need to ask you five questions.

1. Have you had previous experience in both strategic and operational decision making during at least one major event?
2. Have you been in a management level, decision making role at your organization for at least 12 months?
3. Do you have the authority to make decisions regarding the allocation of resources on behalf of your organization?
4. Are you able and willing to participate in this study?
5. Are you able and willing to participate in English?"

[If ANY answer is NO:]

"We really appreciate you taking the time to answer these questions. Unfortunately we will be unable to ask you to participate in this study, at this time.

Once again, thank you for your time."

[If ALL answers are YES:]

"Great. I would like to confirm your participation, and select a date for your session. Which of these dates would suit you best? We have openings on …"

[Refer to dates with open time slots and schedule a mutually agreeable timeslot for the participant]

"The study is being conducted on campus at the University of Ottawa in the Demarais building. The address of the building is 55 Laurier East. Please meet us on the third floor in room 3120 at 8:30 am.

A few days before your session, I will e-mail you to remind you of the appointment. If you have to cancel, please contact us at gapsante@uottawa.ca or (613) 562-5800 Ext. 2321.

I look forward to meeting you on **[date of session]**. Thank you very much for helping us with our research."

Q.4 Reminder E-mail

Dear <insert participant name>,

This is a reminder of your upcoming appointment to participate in the **Problem-solving and Organizational Decision-making Simulation (PODS) Project** experiment on **<insert date>**. Please come to **room 3120** on the 3rd floor of the Desmarais Building located at the University of Ottawa; there will be signs to help direct you. The session begins at 8:30 am and runs until 12:30 pm. A light lunch will be served following the session.

The Desmarais Building is located at 55 Laurier Avenue East (click here for a link to our location on Google Maps). If you arriving by bus, please exit at Laurier Station. Directions to the Desmarais Building by car can be found following this e-mail.

Underground parking is available in the Desmarais Building (at a cost of $4.00 an hour, prepaid). In order to access the parking, you must take the 417E exit at Nicholas Street. Next, take your first right after you go across the Laurier intersection. Alternate options for parking are available in the Byward Market or at the Rideau Centre.

If you have any questions about the study, please do not hesitate to contact Hilary Kitchener by e-mail at hkitc036@uottawa.ca or by phone at 613-562-5800 ext. 2321. If, for any reason, you need to cancel your appointment please let us know as soon as possible.
Sincerely,

<insert name of sender>

- -

Directions to Desmarais Building, University of Ottawa

Desmarais Building from the East

The main access to Ottawa from the East is via Highways 417 and 174.

- Off Highway 417 West, take the Nicholas/Mann exit
- Follow the Nicholas Street exit to Laurier Avenue. (Continue straight ahead, do not turn on Laurier)
- Turn right (east) immediately after Laurier Avenue intersection to access the Desmarais Building parking lot.

Desmarais Building from the West

The main access to Ottawa from the West is via Highways 417 and 7.

- Off Highway 417 East, take the Nicholas/Lees exit.

- Follow Nicholas Street to the first set of lights (Laurier Avenue) (Continue straight ahead, do not turn on Laurier)
- Turn right (east) immediately after Laurier Avenue intersection to access the Desmarais Building parking lot.

Desmarais Building from the South

The main access to Ottawa from the South is via Highways 16, 31 or 416.

From Highway 16:

- Follow Prince of Wales Drive to Carling Avenue
- Turn right (east) on Carling Avenue
- Follow Carling Avenue to Bronson Avenue
- Turn left (north) on Bronson Avenue
- Follow Bronson Avenue to Laurier Avenue
- Turn right (east) on Laurier Avenue
- Follow Laurier Avenue to Waller Street
- Turn right (south) on Waller Street, and follow loop around the condominiums to Nicholas Street
- Turn right (north) on Nicholas Street
- Turn right (east) immediately after Laurier Avenue intersection to access the Desmarais Building parking lot.

From Highway 31:

- Follow Bank Street to Isabella Street
- Turn right (east) on Isabella Street
- Off Isabella Street, take the Highway 417 East on-ramp
- Off Highway 417 East, take the Nicholas/Lees exit.
- Follow Nicholas Street to the first set of lights (Laurier Avenue) (Continue straight ahead, do not turn on Laurier)
- Turn right (east) immediately after Laurier Avenue intersection to access the Desmarais Building parking lot.

From Highway 416:

- Take the Highway 417 East on-ramp
- Off Highway 417 East, take the Nicholas/Lees exit.
- Follow Nicholas Street to the first set of lights (Laurier Avenue) (Continue straight ahead, do not turn on Laurier)
- Turn right (east) immediately after Laurier Avenue intersection to access the Desmarais Building parking lot.

Desmarais Building from the North (Quebec)

The main access to Ottawa from the North is via Highways 5, 50 and 148 in Quebec.

- Follow the indications for Ottawa via Macdonald Cartier Bridge
- Off the Macdonald Cartier Bridge, follow the indications for King Edward Avenue
- Follow King Edward Avenue to Laurier Avenue
- Turn right (west) on Laurier Avenue
- Follow Laurier Avenue to the third set of lights (Nicholas Street)
- Turn right (north) on Nicholas Street
- Turn right (east) to access the Desmarais Building parking lot.

Q.5 Thank You Letter (pilot testing)

<Insert date>

Dear <Ms./Mr. insert last name>,

On behalf of Gap-Santé, we would like to take this opportunity to thank you for your invaluable input into the Problem-solving and Organizational Decision-making Simulation (PODS) Project at the University of Ottawa, funded by Defence Research and Development Canada (DRDC), the Natural Sciences and Engineering Research Council of Canada (NSERC), and the Social Sciences and Humanities Research Council (SSHRC). With the help of participants such as yourself, this project will contribute to a better understanding of inter-organizational relationships and shared decision-making in the context of emergency events. .

Again, with my colleagues Wayne Corneil, Paul Boutette, Celine Pinsent, and our whole team of graduate students and research assistants, we sincerely appreciate your contribution of time as well as your thoughtful participation in the PODS project. We acknowledge your support for the advancement of knowledge in emergency response and psychosocial preparedness for extreme events in Canada.

Sincerely,

Louise Lemyre, Ph.D, MSRC / FRSC
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Q.6 Thank You Letter (senior level participants)

<Insert date>

Dear <Ms./Mr. insert last name>,

On behalf of Gap-Santé, we would like to take this opportunity to thank you for your invaluable input into the Problem-solving and Organizational Decision-making Simulation (PODS) Project at the University of Ottawa. With the help of participants such as yourself, this project will contribute to a better understanding of inter-organizational relationships and shared decision-making in the context of emergency events.

This project is funded by Defence Research and Development Canada (DRDC), the Natural Sciences and Engineering Research Council of Canada (NSERC), and the Social Sciences and Humanities Research Council (SSHRC). The overall objective of the research project is to identify ways to improve collaboration between the Canadian Forces, emergency response professionals, and other non-traditional partners during extreme events. To this end, as a senior level actor with considerable experience pertaining to these types of events, your participation has been indispensable to the PODS *in vivo* experiment. Results from the experiment will be used to formulate recommendations for effective communication and shared decision making within the context of the Incident Command Structure.

Again, with my colleagues Dr Wayne Corneil, Dr Celine Pinsent, Paul Boutette, and our whole team of doctoral students and research assistants, we sincerely appreciate your contribution of time as well as your thoughtful participation in the PODS project. We acknowledge your support for the advancement of knowledge in emergency response and psychosocial preparedness for extreme events in Canada.

Sincerely,

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Annex R Full Pod Session Equipment Requirements

Quantity	Item	Description	Recommendation
3	POD rooms	Rooms sufficiently large enough to comfortably hold three participants as well as a computer and all camera equipment. Each room will require a wired internet connection.	Rooms should be in close proximity to each other to assist in troubleshooting
1	Control room	Room large enough for at least two administrators and two computers. Ideally, it could also have enough space for observers. Like the POD rooms, it must also have a wired internet connection.	
3	Web camera	Camera software may need to be installed onto the computers prior to starting the experiment.	Logitech Web cam C260
3	USB Conferencing mics/speakers	Web cameras often are equipped with internal microphones, but they create feedback. USB conferencing combined microphone/speaker sets solve this issue.	Phoenix PCS duet conference phone
10	Computers	**Four computers** for open and closed Pods. These computers should include a large monitor suitable for sharing among several people. Computers should also have a minimum of three USB slots as they will be used for the microphones, web cameras and printers. Computers must also be running Windows XP or higher **Two computers** for the control room. One the host the open Pods and one to host the closed Pods. Four computers for observers to watch the session either locally or remotely.	Any brand of PC
3	Video camera	Because the PODS experiment lasts several hours cameras should have internal hard drives suitable for recording up to three hours consecutively.	Sony DCRSX63 or higher
3	Magic Arms	These products can be purchased through most photography stores and will be used to install the video cameras in each room. Important: please ensure that camera mounts are included with each magic arm.	Manfrotto 143 Magic Arm Complete
2	Microphone/earphone headset	These will be used in the control room.	Logitech USB Headset H360
4	Walkie talkies	These will be used as an alternative communication method between PODS	Cobra CXT85C GMRS radios

Quantity	Item	Description	Recommendation
4	Digital Voice recorder	One recorder will be set up to record Walkie Talkie communications. The remaining three will be set up in each Pod to record all Pod audio.	We opted to use an extra laptop and recorded through its internal microphone.
16	Licences internet web conferencing	This will be the method for deploying information to the pods participants. It will also serve as a platform for communication between PODS. Participants are free to speak, chat or even email between PODS	NEFSIS web conferencing NEFSIS.COM

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List of symbols/abbreviations/acronyms/initialisms

ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
ATM	Automated Teller Machine
BBQ	Barbeque
C^2	Command and Control
CB	Citizens' Band
CBRN	Chemical, Biological, Radiological, Nuclear
CBRNe	Chemical, Biological, Radiological, Nuclear, Explosive
CF	Canadian Forces
Co.	Company
CORA	Centre for Operational Research and Analysis
CRTI	Chemical, Biological, Radiological, Nuclear and Explosives Research and Technology Initiative
CSS	Centre for Security Sciences
Demo	Demonstration
DMS	Demarais
DND	Department of National Defence
DRDC	Defence Research & Development Canada
DRDKIM	Director Research and Development Knowledge and Information Management
EMO	Emergency Measures Organization
EMS	Emergency Medical Services
EOC	Emergency Operations Centre
ER	Emergency Room
FC	Forces canadiennes
Feds	Federal Government
G8	Group of Eight
G-20	Group of Twenty
GAP	Groupe d'Analyse Psychosociale
HazMat	Hazardous Materials
HCl	Hydrogen Chloride

ICS	Incident Command System
ISPR	Psychology Integrated System of Participation in Research
GT	Gap Transit
ICU	Intensive Care Unit
ID	Identification
MANCOVA	Multivariate Analysis of Covariance
MANOVA	Multivariate Analysis of Variance
MOU	Memorandum of Understanding
MP3	MPEG-1 Audio Layer 3
NGO	Non-governmental Organization
NI	Non-Incident Command System
NIMS	National Incident Management System
No.	Number
Non-ICS	Non-Incident Command System
NSERC	Natural Sciences and Engineering Research Council of Canada
PC	Personal Computer
PODS	Problem-solving and Organizational Decision-making Simulation
PRiMer	Psychosocial Risk Manager
R&D	Research & Development
RCMP	Royal Canadian Mounted Police
SARS	Severe Acute Respiratory Syndrome
SDM	Shared Decision Making
SPSS	Statistical Package for the Social Sciences
SSHRC	Social Sciences and Humanities Research Council
SSMD	Sort & Send Mail Delivery
TA	Technical Authority
TBD	To be decided
TIF	Technology Innovation Fund
TCPS	Tri-Council Policy Statement
uOttawa	University of Ottawa
USB	Universal Serial Bus

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Research Using In Vivo Simulation of Meta-Organizational Shared Decision Making (SDM): Task 3 – Testing the Shared Decision Making Framework in Vivo

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This report documents the completion of Task 3 of the work stream "Research Using in Vivo Simulation of Meta-Organizational Shared Decision Making (SDM)", one component of the Technology Innovation Fund (TIF) program on Meta-organizational Collaboration that has been designed to assist in understanding challenges faced by the Canadian Forces (CF). The objective of the stream is to conduct basic research into shared decision making through the analysis of case studies, exercises and simulations. Task 3 involved the development and testing of the shared decision making framework in vivo. The research at this stage is to demonstrate that the model when implemented *in vivo* can produce improvements in problem solving processes and outcomes such as better quality decisions, higher levels of satisfaction with problem solving processes, better time-to-satisfaction ratio and more cohesive multi-organization groups.

Ce rapport traite de l'exécution de la Tâche 3 du projet intitulé : « *Recherche par la simulation in vivo sur la prise de décision partagée des méta-organisations* », une des composantes du programme du Fonds pour l'innovation technologique (FIT) relatif à la collaboration méta-organisationnelle, qui a été conçu afin d'améliorer la compréhension des défis auxquels font face les Forces canadiennes (FC)**.** L'objectif de ce volet particulier est de mener une recherche de base sur le partage des décisions au moyen d'études de cas, d'exercices et de simulations. La Tâche 3 consistait à élaborer le cadre de partage des décisions in vivo et d'en faire l'essai. À ce stade, la recherche visait à démontrer que le modèle, lorsqu'il est mis en œuvre *in vivo*, peut aider à améliorer les processus de résolution des problèmes et leurs résultats, notamment des décisions de meilleure qualité, de hauts niveaux de satisfaction en ce qui touche les processus de résolution des problèmes, un meilleur rapport temps-satisfaction et des groupes multi-organisationnels plus cohésifs.

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Inter-organizational; collaboration; cooperation; coordination; decision making; problem solving; complex situations; TIF; meta-organization