An Overview of Pilot Projects in Support of Critical Infrastructure Resilience

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***Abstract*— This paper describes four pilot projects undertaken in the Province of British Columbia (BC) by the Defence Research and Development Canada - Centre for Security Science (DRDC CSS) in partnership with Emergency Management British Columbia (EMBC) and local communities. Pilot projects occurred between May 2012 and January 2014 with four communities of population ranging from 5000 to 100,000, and with Metro Vancouver's regional transportation authority. Various aspects of CI resilience were targeted, from understanding and analysing dependencies to enhancing planning and resilience. Different analytical approaches were employed, such as architecture frameworks, value-focused thinking and the application of existing risk tools. In a previous paper describing problem formulation and the solution strategy, a number of challenges to CI resilience were identified, related to governance, trust, information sharing, culture, assessment methodologies and resources. Pilot projects are evaluated here in light of these challenges. Our experience has led us to hypothesize that it is not tools per se that communities want, but rather meaningful analyses performed with an understanding of the local environment.**

Keywords—critical infrastructure, resilience, pilot project, tools, architecture frameworks, mission-to-task analysis, value-focused thinking, risk, emergency management, British Columbia

I. INTRODUCTION

This section will include background information, including:

- The context of CI in Canada [1,2]
- Goals for the project: (1) To support the client, Emergency Management British Columbia, in achieving their objectives; (2) To demonstrate the value of a scientific, structured approach for improving emergency management capabilities; and (3) To develop approaches to the CI problem, including tools and assessment methodologies, which can be applied nationally.
- Overview of "the CI problem" in British Columbia, approach to the problem and challenges identified [3,4]

II. PILOT 1 – SYSTEMS ANALSYIS OF COMMUNITY RESILIENCE

This section will include:

- Project overview, outcomes, assessment of challenges [5-9]
- Analytical approach: architecture frameworks and soft systems methodology
- Community: Pemberton Valley (near Whistler), including Lil'wat First Nations community
- Contractor: Serco UK

III. PILOT 2 - VALUE-FOCUSED THINKING AND MISSION TO TASK ANALYSIS FOR HAZARD PLANNING

This section will include:

- Project overview, outcomes, assessment of challenges [10-14]
- Analytical approach: mission-to-task analysis and value-focused thinking
- Communities: Cities of Nanaimo and Parksville, Vancouver Island
- Contractor: KaDSci

IV. PILOT 3 – TRANSLINK CRITICAL INFRASTRUCURE ANALYSIS

This section will include:

- Project overview, outcomes, assessment of challenges [15]
- Analytical approach: RiskOutlook

- Organization: TransLink, Metro Vancouver's regional transportation authority

V. Pilot 4 – Critical Infrastructure Assessment Tool

This section will include:

- Project overview, outcomes, assessment of challenges [16]
- Analytical approach: Dependency grids
- Community: Corporation of Delta

VI. Discussion and Conclusions

This section will include a discussion of themes observed across pilot projects and what we learned, such as:

- Challenges – better sense of which ones can be more easily overcome.
- "Success" of projects - How much is particular to a community and how much can be generalized to any community?
- Working through emergency management coordinators led to input that was response-focused; mitigation, prevention and recovery were weak.
- Risk Management Framework - We anticipated that the results of pilot projects would feed into risk management frameworks; however, it appears that many communities do not have well-established risk management processes.
- Analytical capability – More than a tool, communities seem to want an analyst who can use a tool(s) and help them understand how to use the results. This appears to be a capability (people, tools, process) gap.
- Difficult to create an "analyst in a box".

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References

[1] "National Strategy for Critical Infrastructure" Public Safety Canada, 2009

[2] "Action Plan for Critical Infrastructure 2014-2017", Public Safety Canada, 2014

[3] Genik, L., Chouinard, P., "DRDC Support to Emergency Management British Columbia's (EMBC) Hazard Risk Vulnerability Analysis (HRVA) and Critical Infrastructure (CI) Programs: Problem Formulation and Solution Strategy", DRDC CSS TM-2012-015, October 2012

[4] Genik, L., "Operations Research Support for Critical Infrastructure Resilience in the Province of British Columbia", The Homeland Security Review, Vol 7, No. 1, Winter 2013, DRDC CSS SL-2012-016

[5] Genik, L., "Pemberton Valley Community Resilience Pilot Study", DRDC CSS LR to Squamish-Lillooet Regional District Emergency Program Manager, June 2013

[6] Deith, I., Serco UK, "Community Resilience Project: Work Plan & Execution Strategy", DRDC CSS CR 2012-030, December 2012

[7] [Deith, I., Serco UK, "Community Resilience Project: Selection of Resiliency System & Problem Definition" (Protected B), DRDC CSS CR 2012-031, December 2012

[8] Deith, I., Serco UK, "Community Resilience Project: 'As Is Architecture'" (Protected A), DRDC CSS CR 2013-017, October 2013

[9] Deith, I., Serco UK, "Community Resilience Project: Evaluation of the utility of architecture frameworks and soft systems methodology", DRDC CSS CR 2013-018, October 2013

[10] Coates, C., Kobierski, R., CMC Eletronics, "Scenario Mission Task Analysis Report: Scenario and Mission Objectives Research Report," DRDC CSS CR 2013-008, July 2013

[11] Maxwell, D., Davis, D., KaDSci, Value Focused Metrics for Improved Emergency Management Planning - Part 1: Objectives Measurement Framework, DRDC CSS CR-2013-020, October 2013

[12] Maxwell, D., Davis, D., KaDSci, "Value Focused Metrics for Improved Emergency Management Planning - Part 2: Identification and Assessment of Mission Tasks", DRDC CSS CR-2013-021, October 2013

[13] Maxwell, D., Davis, D., KaDSci, "Value Focused Metrics for Improved Emergency Preparedness Planning - Part 3: 'Unified' Baseline Value Focused Metrics Model", DRDC CSS CR-2013-022, November 2013

[14] Maxwell, D., Davis, D., KaDSci, "Value Focused Metrics for Improved Emergency Management Planning - Part 4: Evaluation of the Utility of Scenario-Based Mission to Task Analysis", DRDC CSS CR-2013-023, December 2013

[15] Chouinard, P., Genik, L., "TransLink Critical Infrastructure Analysis", DRDC CSS LR to TransLink, November 2013

[16] Genik, L. "Critical Infrastructure (CI) Assessment with the Corporation of Delta" (Protected A), DRDC-RDDC-2014-L17, February 2014