



CAN UNCLASSIFIED



DRDC | RDDC
technologysciencetechnologie

Exercise SALISH SEA 2017: Evaluation of Emergency Operations Centre/Command Post Exercise

Peter Dobias
Cheryl Eisler

DRDC – Centre for Operational Research and Analysis

Defence Research and Development Canada

Scientific Letter

DRDC-RDDC-2017-L311

September 2017

CAN UNCLASSIFIED

IMPORTANT INFORMATIVE STATEMENTS

Disclaimer: Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence ("Canada"), makes no representations or warranties, express or implied, of any kind whatsoever, and assumes no liability for the accuracy, reliability, completeness, currency or usefulness of any information, product, process or material included in this document. Nothing in this document should be interpreted as an endorsement for the specific use of any tool, technique or process examined in it. Any reliance on, or use of, any information, product, process or material included in this document is at the sole risk of the person so using it or relying on it. Canada does not assume any liability in respect of any damages or losses arising out of or in connection with the use of, or reliance on, any information, product, process or material included in this document.

Endorsement statement: This publication has been peer-reviewed and published by the Editorial Office of Defence Research and Development Canada, an agency of the Department of National Defence of Canada. Inquiries can be sent to: Publications.DRDC-RDDC@drcd-rddc.gc.ca.

This document was reviewed for Controlled Goods by Defence Research and Development Canada (DRDC) using the Schedule to the *Defence Production Act*.

© Her Majesty the Queen in Right of Canada (Department of National Defence), 2017

© Sa Majesté la Reine en droit du Canada (Ministère de la Défense nationale), 2017

CAN UNCLASSIFIED



September 2017

DRDC-RDDC-2017-L311

Prepared for: RAdm A. McDonald, Commander MARPAC/JTFP

Scientific Letter

Exercise SALISH SEA 2017: Evaluation of Emergency Operations Centre/Command Post Exercise

Background

The Commander of Maritime Forces Pacific (MARPAC)/Joint Task Force Pacific (JTFP) is also the Search and Rescue Region (SRR) Commander. It is his or her mission to prevent or minimize injury and loss of life through the expeditious and effective use of all available resources in the event of a major marine disaster (MAJMAR) in the Canadian Search and Rescue (SAR) area of responsibility [1][2][3]. Should a MAJMAR event involving a large capacity vessel such as a cruise ship or ferry occur, thousands of lives would be at stake. How the federal, provincial, and local authorities collectively respond to an event of this nature is critical to the successful response to such an incident. Exercise SALISH SEA 2017 (EX SASE 17) is intended to provide an opportunity to exercise this scenario, identify areas to refine the procedures and to build public confidence in a unified response to a MAJMAR event [4][5]. EX SASE 17 is designed in a series of progressive, smaller exercises based on the “crawl, walk, run” strategy: a Table Top Exercise (TTX), an Emergency Operations Centre Exercise (EOCX), and a Full Scale Exercise (FSX). MARPAC/JTFP Chief of Staff Plans and Operations (N3/J3) asked the MARPAC Operational Research Team (ORT) to lead the exercise evaluation for MARPAC/JTFP, as well as coordinate the evaluation between participating agencies.

The first exercise in the series, TTX SASE 17, took place on 16 May 2017 at the Canadian Forces Base (CFB) Esquimalt. The analysis identified a number of issues and areas of improvement recommended to improve the MAJMAR contingency plans and the execution of other EX SASE 17 components [1]. The EOCX SASE 17 was conducted on 19 September 2017; its scope was much smaller than that of the TTX, and was intended primarily to test communications and situational awareness between Emergency Operations Centres. This Scientific Letter documents the analysis and observations¹ from the EOCX. The details of the EOCX design and organization are summarized below. The EOCX-specific objectives were to [5]:

1. Validate compliance with existing plans for responding to a major maritime disaster and their interoperability. For the EOCX, this included:
 - a) The Joint Rescue Coordination Centre (JRCC) MAJMAR plan [2], and
 - b) The draft JTFP MAJMAR Contingency Plan (CONPLAN) [3].
2. Initiate casualty management process.
3. Identify methods of sharing Situational Awareness (SA) and maintaining a Common Operating Picture (COP).

¹ Under Article 2.5 of the Tri-Council Policy Statement 2 - Chapter 2, this project is exempt from review by the DRDC Human Research Ethics Board.



EOCX Design and Assessment Methodology

The EOCX was a functional exercise,² which included the following participants:

- British Columbia Emergency Health Services (BCEHS)
- BC Ministry of Environment (BC MoE)
- Canadian Coast Guard (CCG)
- Capital Regional District (CRD) EOC
- Emergency Management BC (EMBC)
 - Provincial Regional Operations Centre (PREOC), Vancouver Island (VI)
 - Provincial Emergency Coordination Centre (PECC)
- Galiano Island EOC
- Joint Task Force Pacific (JTTFP)
- Joint Rescue Coordination Centre (JRCC)
- Public Safety Canada (PS Canada), Pacific Region
- Salt Spring Island Emergency Operations Centre (EOC)
- Transport Canada (TC)

The EOCX employed a scenario that was consistent with the one used for TTX SASE 17 [1], as well as with the one that will be used on 25–27 October 2017 for the FSX. The scenario involved a simulated fire on board a BC ferry with the subsequent evacuation of 1,385 passengers and 26 crew, resulting in the overtaxing of shore authorities required to provide for the care of the passengers recovered from the stricken vessel. Real-time weather and asset/crew availability were used for 19 September 2017. Players from participating organizations were expected to perform the notifications tasks that they would normally perform during response operations. A small number of organizations chose to exercise internal processes for standing up of EOC's; however, most player actions were limited to actual or simulated communications functions. Refer to Annex A, Figure A.1 for a diagram that summarizes the participants roles and communications links and means during the EOCX.

Due to the constrained nature and scope of the exercise, there were several unavoidable artificialities present. For example, not all organizations that would normally respond could play during the exercise, and so some organizations' responses were simulated. While the simulated actions detracted from the realism of the exercise, they were accepted as a means of facilitating the accomplishment of exercise objectives. Players were asked not to make any assumptions outside of the scope of their role (e.g., with respect to asset locations, timings, and/or availability). Players were also asked to complete a log of activity and use a provided template for emails. Copies of all emails were to be sent to the provided Exercise Control (EXCON) email address. This facilitated post-exercise analysis. [6]

Controllers and evaluators were co-located with players at each of the EOC's in order to monitor communications, log player actions, and record tasks completed with respect to the MAJMAR CONPLANS [7]. The task evaluations completed by controllers/evaluators were used to calculate the percentage of each plan completed. This quantitative component of the analysis

² Functional exercises are single or multi-agency activities designed to test and evaluate, in a simulated real-time environment, agency capabilities, multiple functions or activities within a function, or interdependent groups of functions. They focus on exercising plans, policies, procedures, and staffs involved in management, direction, command, and control functions, such as EOC personnel, controllers and simulators, and evaluators. Events are projected through a scripted exercise scenario with built-in flexibility that allows updates to drive activity at the management/operational level. Movement of personnel and equipment is simulated.



methodology was identical to the one used for the TTX [1], in order to facilitate direct comparison in achieving objectives between the two events. In addition, participant feedback forms were collected³ that captured observations and suggestions based on the exercise. The qualitative assessment was based on the direct observations by the evaluators and the collected feedback during JTFP Battle Update Brief, BWOC de-brief, and the post-exercise hotwash.

Results

Despite the reduced scope of the EOCX, the general observations were consistent with the observations made during the TTX [1]. It is important to note here again that the task compliance is dependent upon the record of such tasks as complete; if the controllers/evaluators were unable to assess if the tasks were completed due to the lack of information presented by the players or their logs, then the tasks were recorded as incomplete.

Figure 1 shows the recorded compliance with the JRCC and JTFP MAJMAR CONPLANS (EOCX Objective 1). While the relative compliance for the JRCC CONPLAN tasking's increased from 46% for the TTX to 56% for the EOCX, the EOCX covered less of the scenario (only two hours were played) compared to TTX, included fewer participants, and considered fewer tasks within scope to complete. Because of the large number of tasks outside of the scope of EOCX compared to TTX (approximately 50% vs. 15%), no definite conclusions can be made about the change in performance. As the JTFP CONPLAN was not drafted at the time of TTX, no comparison between the two events was possible. The relative compliance for JTFP's tasks within the scope of the EOCX was comparable with that for the JRCC CONPLAN; however, a far greater proportion of the JTFP CONPLAN tasks were out of scope for this event due to the limited duration of the exercise.

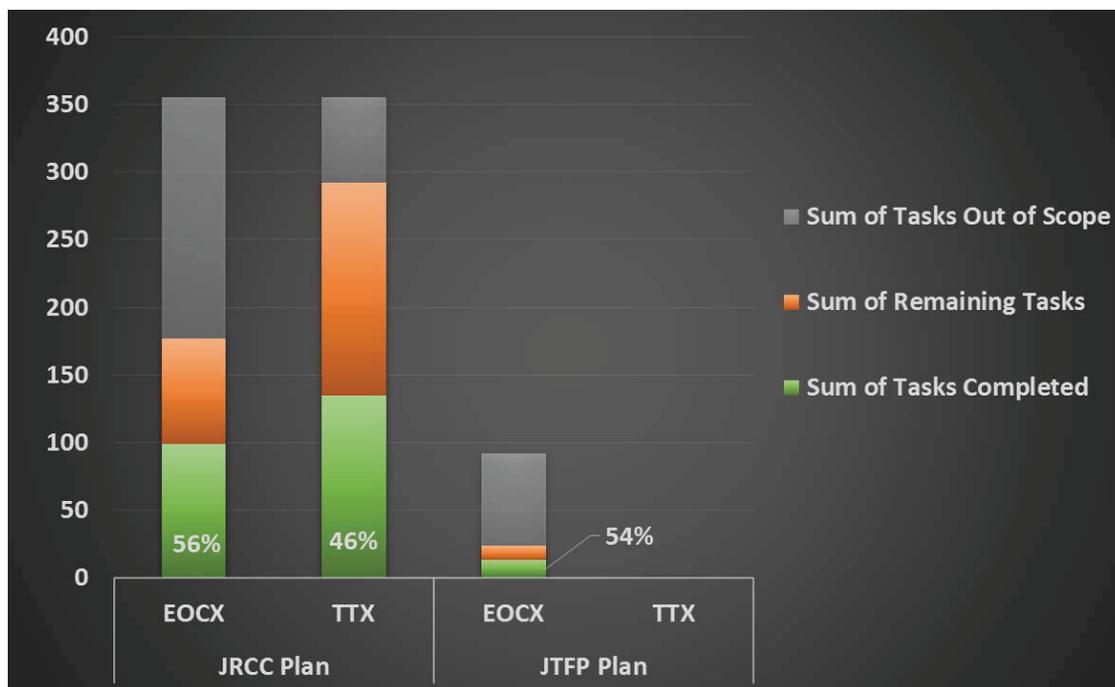


Figure 1: Compliance with MAJMAR Plans (% of the tasks within the EOCX scope).

³ Six forms from the JRCC, four from the JTFP, and five from the CCG.



The main gaps in compliance with the MAJMAR plans existed at a) the command level (e.g., formal issuance of orders), b) the interface to other organizations (e.g., notifications or requesting Liaison Officers (LOs)), and c) officially standing up the incident command centre. Communications between multiple agencies at various levels of government (federal, provincial, municipal) and private interests were fraught with organizational/cultural assumptions. As a result, it was often not clear what one organization was expecting another to do upon the delivery of certain pieces of information. In addition, there was a lack of coordination among participants when all possible assets were assigned to the problem without providing appropriate oversight to ensure minimization of duplication of effort. More detailed organizational- and plan-specific observations can be found in Annex B.

EOCX Objective 2 was only assessed to the point that it can be said that the casualty management process was initiated. The scenario did not progress far enough to provide any commentary on the casualty management process itself.

EOCX Objective 3 was only partially assessed. Shared situational awareness (SA) was captured in the form of major asset availability, movements, status, and persons on board. It was noted that there were some transcription errors in the data, as well as player-introduced “updates” that did not come from readily available knowledge or EXCON injects. Unfortunately, further assessment was not possible due to a lack of tactical logs from several participating organizations. Because of the decision to focus the EOCX at the operational vice tactical level (without simulating asset responses), there were insufficient inputs to maintain and track the normally complex flow of SA to various organizations. Again, refer to Annex B for more detail.

Participants’ feedback was collected in order to assess the utility of the exercise with respect to the overall understanding of individual organization’s and other organizations’ responsibilities and communications requirements. For the JRCC/JTFP, most participants agreed that because of the EOCX, they had improved understanding of:

- CONPLANS,
- Personal responsibilities and communications requirements, as well as
- Own organization’s responsibilities and communications requirements.

These results may indicate a lack of familiarity with the CONPLANS prior to the EOCX. In contrast, most participants were neutral or did not have an improved understanding of other organizations’ responsibilities or communications requirements. This may indicate either continued stove piping or a good familiarity with other organizations’ roles and responsibilities. Most CCG participants were neutral or had an improved understanding across the majority of personal, organizational and other organizational responsibilities and requirements. Refer to Annex C for more comprehensive participant feedback.

Recommendations and Conclusion

The findings from the EOCX below reinforce those from the TTX [1]. The recommendations from the lessons noted during the exercise can be grouped into three categories; the first category looks at the JTFP and JRCC MAJMAR plans and procedures, the second category looks at how to improve the FSX, and the third contains recommendations for possible future JTFP command post exercise (CPX)/EOCX implementations.



MAJMAR Plans and Procedures:

- Consider revising the CONPLANS for JRCC and JTFP to reflect best practices as identified during the series of exercises, as well as the legal framework and operational command of marine and air SAR assets as directed by CAMSAR [8] and the appropriate plan hierarchy as outlined in the CAF Operational Planning Process [9]. This would simplify coordination across JTFP components, limit duplication of effort, and avoid potentially conflicting tasks assigned by the two CONPLANS to the JTFP chain of command. Components, such as JRCC, could then develop appropriate subordinate CONPLANS or supporting plan (SUPLANS) for their respective elements that would support the overarching JTFP CONPLAN.
- Clearly map/define the C2 structure (tasking ability), reporting chains (communication lines/means) and required timelines over the duration of the MAJMAR event. For example, this should include the division of responsibilities between JTFP and MARPAC (“J” and “N” chains of command). This should be included as an annex to the CONPLAN.
- Develop a communications plan and notification checklists, and include it as an annex to the CONPLAN.
- Establish a simple, robust, platform-independent format(s) or system(s) for situational awareness, coordination of assets, and casualty tracking and reporting. This should include a vetted baseline data repository for major capabilities disposition, status, and availability in the SRR Commander’s area of responsibility.
- Explicitly integrate the involvement of Public Affairs early in the process to ensure that the potential impact that media (including social media) is not marginalized or ignored in scenario development. Consider the bottom up and lateral flow of information and its impact on the event.
- Develop and document an explicit data priority/trust scheme to ensure that inconsistencies in data from information transfers are handled in a rigorous manner.
- Develop a sync matrix across all main agencies that will include information sharing requirements, key expected events, and decision points, as well as explicit requests and tasking’s that should be passed between agencies.
- Establish a regular series of exercises (TTX or CPX with simulated tactical forces) and perform objective, qualitative and quantitative evaluations to determine if performance improvement is being made.

EX SASE 17 (FSX):

- Stand up a Simulation Cell to address requests for information (RFI) outside of the scope of play, represent organizations and actors that are not participating in the exercise but would likely be involved in real-life MAJMAR event, and possibly create additional injects outside the master scenario event list (MSEL) – should they be required).
- Train EXCON, controllers, evaluators, and players ahead of the exercise events to ensure compliance with data collection requirements, measures, and rules of conduct, and to prevent assumptions and injects being made outside of the players’ scope of play.

CPX/Game Design:

- Participants need to familiarize themselves with written instructions, plans, handbooks and checklists distributed prior to the event. It needs to be stressed during the initial brief that no additional assumptions are to be made by players; instead, they are to send an RFI to EXCON or the Simulation Cell.



- In order to reduce artificial assumptions made by participants, for operational-level exercises, a Simulation Cell should be employed to simulate non-participating forces and to provide responses to RFIs outside of the scope of individual players. In some cases, establishing a (stochastic) decision tree to provide feedback based on the actions of the participants may be useful to support the MSEL.

All organizations would benefit from conducting regular CPX training to address a variety of contingencies to ensure both the familiarity of the staff with the CPX planning and execution, and at the same time reinforce knowledge of respective CONPLANS and facilitate their improvements and continued relevance.

Prepared by: Dr. Peter Dobias and Cheryl Eisler (DRDC – Centre for Operational Research and Analysis).

References

- [1] C. Eisler and P. Dobias (2017), Exercise SALISH SEA 2017: Table Top Exercise, DRDC-RDDC-2017-L193.
- [2] Joint Rescue Coordination Centre (2 November 2015), JRCC Victoria Major Marine Disaster Plan (CONPLAN MAJMAR - CCG and CF RESPONSE TO A MAJOR MARINE DISASTER (MAJMAR).
- [3] Joint Task Force Pacific (5 September 2017), JTFP CONPLAN MAJMAR, Draft, 6435-3120-1 (J7/RDIMS 678588).
- [4] EX SALISH SEA 2017 (7 September 2017), Exercise Directive – SALISH SEA 2017, 6435-4500-1 (J7/RDIMS 704677).
- [5] EX SALISH SEA 2017 (30 Mar 2017), Exercise Specification – SALISH SEA 2017, 6435-3352-1 (J7/RDIMS 635518).
- [6] S. Hughes, C. Eisler, et. al. (18 Sep 2017), EMERGENCY OPERATIONS CENTRE EXERCISE (EOCX) SALISH SEA 2017: Player's Handbook.
- [7] C. Eisler, S. Hughes, et. al. (18 Sep 2017), EMERGENCY OPERATIONS CENTRE EXERCISE (EOCX) SALISH SEA 2017: Controller/Evaluator Handbook.
- [8] Chief of the Defence Staff and Commissioner Canadian Coast Guard (2014), CAMSAR: CANADIAN AERONAUTICAL AND MARITIME SEARCH AND RESCUE MANUAL (online), Available at: <http://ccga-pacific.org/training/manuals/CAMSAR-2014-english-signed.pdf> (Access Date: 24 September 2017).
- [9] Chief of Defence Staff (2008), Canadian Forces Joint Publication 5.0, The Canadian Forces Operational Planning Process, (B-GJ-005-500/FP-000).
- [10] Chief of Defence Staff (2011), Canadian Forces Joint Publication 3.0, Operations, (B-GJ-005-500/FP-001).
- [11] J. Anderson, and N.K. Slate (2003), The Case for a Joint Military Decision Making Process, Military Review, PB-100-13-9/10.
- [12] US Army FM 101-5: Staff Organization and Operations, Chapter 5: The Military Decision Making Process.



- [13] US Marine Corps MCWP 5-1 Marine Corps Planning Process, 2010.
- [14] Canadian Coast Guard (2015), National Incident Notification Procedure: Informing Canadian Coast Guard and Fisheries and Oceans Canada Senior Management of Significant Events, National Policy and Procedure (EKME # 3551394).
- [15] N. Stanton, C. Baber, and D. Harris (2008), Modelling Command and Control: Event Analysis of Systemic Teamwork, Ashgate Publishing, Ltd.
- [16] Government of Canada (2007), Emergency Management Act (online), Available at: <http://laws.justice.gc.ca/eng/acts/E-4.56/> (Access Date: 24 September 2017).
- [17] Public Safety Canada (2011), Federal Emergency Response Plan (online), Available at: <https://www.publicsafety.gc.ca/cnt/rsrscs/pblctns/mrgnc-rspns-pln/index-en.aspx> (Access Date: 24 September 2017).
- [18] Province of British Columbia (2017), BC Legislation and Regulations (online), Available at: <http://www2.gov.bc.ca/gov/content/safety/emergency-preparedness-response-recovery/emergency-management-bc/legislation-and-regulations> (Access Date: 24 September 2017).
- [19] Queen's Printer (2017), Emergency Health Services Act (online), Available at: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96182_01 (Access Date: 24 September 2017).
- [20] Emergency Management British Columbia (2012), The All-Hazard Plan (online), Available at: <http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/embc-all-hazard-plan.pdf> (Access Date: 24 September 2017).
- [21] Queen's Printer (2017), BC Emergency Program (online), Available at: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96111_01 (Access Date: 24 September 2017).
- [22] Queen's Printer (2017), (online), Available at: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/380_95 (Access Date: 24 September 2017).
- [23] Emergency Management in BC: Reference Manual (online), Available at: http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/embc/training/reference_manual.pdf (Access Date: 24 September 2017).
- [24] Province of British Columbia (2012), PECC/PREOC Deployment Support Annex (online), Available at: http://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/pecc-preoc-deployment_annex.pdf (Access Date: 24 September 2017).
- [25] Transport Canada (2011), Legal Framework (online), Available at: <https://www.tc.gc.ca/eng/emergencypreparedness/emergencypreparedness-108.htm> (Access Date: 24 September 2017).



This Scientific Letter is a publication of Defence Research and Development Canada. The reported results, their interpretation, and any opinions expressed therein, remain those of the authors and do not necessarily represent, or otherwise reflect, any official opinion or position of the Canadian Armed Forces (CAF), Department of National Defence (DND), or the Government of Canada.

© Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2017

© Sa Majesté la Reine (en droit du Canada), telle que représentée par le ministre de la Défense nationale, 2017



Annex A Information Flow/Communications Diagram for the EOCX

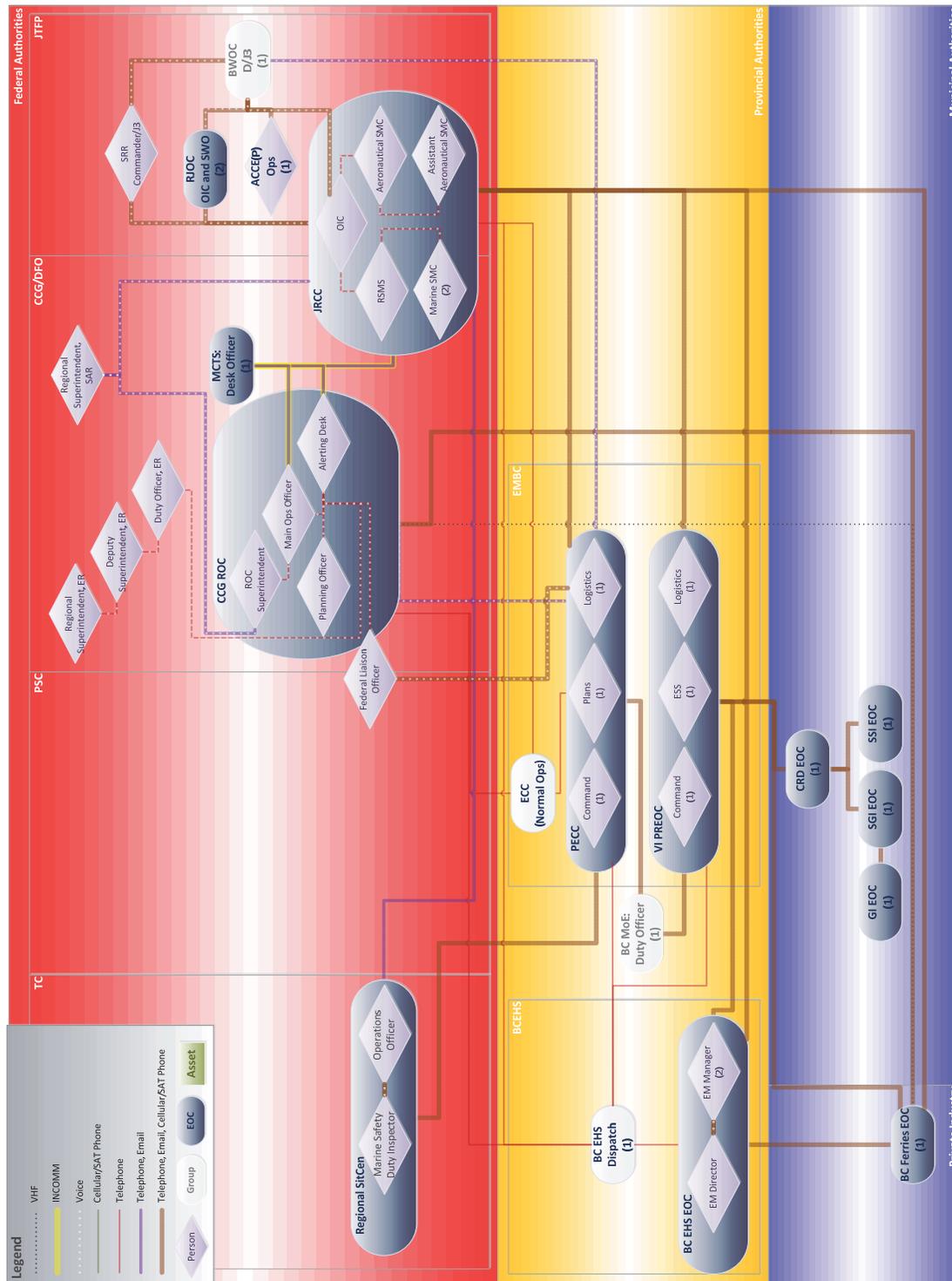


Figure A.1: Information flow/communications diagram for the EOCX.



Annex B JRCC/JTFP-Specific Observations

The purpose of this annex is to capture the organizational- and contingency plan-specific observations that were noted as a result of the exercise. The observations are broken down by exercise objective, as in the main body of the letter.

EOCX Objective 1: Compliance with JRCC/JTFP MAJMAR CONPLANS

Overall, the two CONPLANS overlap to a considerable degree; nearly half of the consolidated tasks listed appear in both plans. However, there are some tasks in each plan that are critical steps that should not be left out. Given that so many of the organizations, operations centres and primary actors in each plan appear in both, it is important that the two plans are either: updated at the same time with the same information and procedures, or entirely separated so that no overlap exists. There is a third option, to render both plans sufficiently generic that any changes to organizational commands, structure, or detailed procedure do not impact the plans. The disadvantage of such a course of action is that it renders the plans nearly devoid of any detail to be of use to operational and tactical units. Consequently, the following changes are suggested for incorporation.

At the command level, the JRCC MAJMAR CONPLAN [2] calls for the SRR Commander to contact the Government Operations Centre (GOC) and initiate notifications to a number of specific agencies and request initiation of a domestic events conference call with the Federal Coordination Group (FCG). However, at the Final Planning Conference (FPC), the Public Safety Canada (PSC) representative stated that the SRR Commander should request PSC to conduct the notifications, as representatives of the GOC, and set up the FCG call. This should likely be reflected in the updated plan, as it would reduce the notification demand on the SRR Commander and enable him or her to devote more time to the response.

Since the time of writing the JRCC MAJMAR CONPLAN [2], the JTFP/MARPAC command structure has undergone a significant organizational shift. The JTFP/MARPAC command structure is progressing towards a structure that is more closely aligned with the Canadian Joint Doctrine-prescribed continental (joint) command structure [10]. As a result, the tasks formerly allotted to particular staff are not necessarily applicable anymore. For example, the “J3 Land” position no longer exists, and the Deputy J3 (D/J3) reports to J3 (Operations), who is double hatted as MARPAC N3 (Chief of Staff Plans and Operations), who then reports to the JTFP/MARPAC/SRR Commander.

During the EOCX, the role of SRR Commander and J3 were designated to Acting J3 (A/J3) due to an unexpected absence, and navy-specific issues were to be addressed to Acting N3 (A/N3). Because the two acting roles were represented independently, this led to a split in the delivery of information. The confusion was possibly caused in part by the fact that it was not clear to the players whether the SAR responsibility fell under the navy or the JTFP chain of command. The confusion was strengthened by the JRCC MAJMAR CONPLAN reflecting the old command structure and directing staff to inform N3, despite the fact that the JRCC falls under the JTFP chain of command. Consequently, J3 should have been informed instead. However, the A/J3 was not informed about the incident until approximately 45 minutes into the event; in contrast, A/N3 was informed approximately 15 minutes into the play. This delayed some follow-on tasks that the A/J3 was responsible for conducting.



The delay in notifying A/J3 led, in turn, to delayed notification of EMBC by the JRCC/JTFP. While EMBC received the initial notification of the incident at approximately 09:45 (start of the exercise), the information did not provide sufficient detail upon which to act. As was brought up by both the EMBC representatives and the representatives of local municipalities at the FPC, this would lead to the local municipalities acting upon incomplete and potentially erroneous information coming from passengers and local population via social media, personal phone calls, and calls to 911. In response to these calls, the local authorities would dispatch resources to the scene; while they would try to coordinate with the JRCC, it would still possibly lead to potential confusion on scene until JRCC assets arrive. However, this likely bottom-up flow of information was not considered by the EOCX participants at all.

JRCC later (at 10:36, or 51 minutes into the exercise) notified EMBC of the incident, with the JRCC incident log indicating that a briefing of all information was provided to EMBC and a request for assistance at the casualty reception point was made. EMBC provided feedback during the FPC that no indication of what type of support would be required was made during the call. This indicates an organizational/cultural gap that must be overcome to ensure that the notification process works as intended. JRCC completed their notification call as per procedure; however, they did not ask for specific support or resources – there was an assumption that EMBC would action with any and all resources as necessary. When EMBC received the call, they were expecting a specific request, supported with more information in order for them to action the call. The unstated assumptions and expectations led to a breakdown in process, indicating the importance of standardized procedures in such events.

There were a number of tasks assigned to the RJOC(P) that were outside their scope of responsibility or were worded inappropriately. These included considering forward base deployment (a task of D/J3) and standing up the Incident Command Centre upon notification (assuming that this refers to the Battle Watch Operations Centre (BWOC), the RJOC(P) is not responsible for standing up the BWOC; although it does perform the recall procedure and oversee the set-up for the physical support space for the BWOC). The RJOC(P) would also not normally be contacting Transport Canada for a Notice to Airmen (NOTAM) for restrictions to airspace, as that is the JRCC Air Coordinator's responsibility. Their list of actors/agencies to contact should also be updated.

An interesting observation made by the players was that RFIs were typically coming down the JTFP chain through the RJOC(P), while the most up-to-date information flowed into the JRCC. At the same time, there was limited information flow from the JRCC to the RJOC(P). This information flow could be significantly improved if there was a direct communications link between the JRCC and RJOC(P). Problems with the information flow would have been likely compounded by RFIs from Ottawa, had CJOC and other government organizations, as well as national media, been playing.

Lastly, it is important that briefers during updates (e.g., Battle Update Brief) are not necessarily selected based on function (i.e., RJOC(P) Senior Watch Officer) or position within an organization, but are well situated and can provide the most up-to-date (even if partial) information. For example, the Regional Supervisor Maritime Search and Rescue (RSMS) in the JRCC was well informed, considering he was pushing out the National Incident Notification Procedure (NINP) situational reports. In addition, it is recommended that visuals (such as maps of the areas), as well as situational background (e.g., what happened and why, terminology, or standard operating procedures) be provided, since not all in the audience and leadership might be familiar with these. During the EOCX, the A/J3 had to pull the information that should have



been provided by default (standard emergency procedures, number of passengers, if there were any injured, and the fact that the ferry had been evacuated).

EOCX Objective 2: Casualty Management Process

No further observations were noted.

EOCX Objective 3: Sharing SA / Maintaining a COP

It was identified by the JTFP staff that, with the exception of the air assets, they had insufficient information about the BLUE (own) force disposition (in terms of what was available, in what state, and how long it would have taken to get to the scene). This was especially true for army and base-wide capabilities. It was highlighted on at least two occasions that it is the type of information that the senior leadership (SRR Commander and J3) might require to make informed decisions. There was also some duplication of effort in trying to collect relevant information. This all speaks to the need to create and maintain up-to-date vetted baseline information about the BLUE force disposition, and available capabilities and resources.

There were some concerns about the lack of awareness of the responsibilities and requirements up the chain, as well as about the SA on the force disposition down the chain. US Army and Marine Corps planning doctrine introduces a principle that a unit needs to be aware of the intent and mission two levels above, and plan and be aware of force disposition two levels down the chain [11] (citing [12] and [13]). This could be called a “two up – two down” principle. While not explicitly included in the CAF operational planning doctrine [9], incorporating this principle in the JTFP standard operating procedure (SOP) and planning would address many of the voiced concerns.

After the EOCX, it was noted that the NINP (essentially, a situation report email with standardized formatting) was a useful tool among recipients. Normally the initial NINP is only passed from JRCC to CCG, and subsequent NINP are passed from the MSOC to CCG. However, nothing in the content prohibits further distribution and Annex E of reference [14] provides the conditions under which the notification can be forwarded. While the information in the NINP is only a snapshot in time, it is standardized and can be pushed out to federal, provincial and local authorities in a cascading distribution list that ensures that all partners receive the same information at the same time. As mentioned in [14], the NINP may include an MSOC amplifying product, which may include a visual product from the MSOC (such as, for example, a snapshot picture from their COP – the MSOC Portal). This would greatly enhance the utility of the product by illustrating the position of all pertinent ships and aircraft in the vicinity. While it would not include land-based assets and would not be dynamic, it could be the first step towards maintaining a common operating picture for emergency management across all three levels of government in Canada, as well as private industry or other interests.



Annex C Participants' Feedback and Additional Observations

With respect to the exercise design and execution there were a number of observations that were identified by the participants. Some common themes reported from the exercise execution (in many cases repeated from the TTX) were:

- INCOMM⁴ is a vital communications link; unfortunately it is currently not available to all relevant agencies.
- If INCOMM is down or not available, fully functional alternative measures need to be in place with sufficiently detailed usage procedures.
- MAJMAR response plans need to be updated with new roles/organizational structures and when absences occur, transfer of command/roles should be automatic and well defined.
- Plans and procedures exist and should be followed so that organizations receive appropriate notifications.
- Liaison Officers should be requested as mandated by the plans, as Liaison Officers (when used) were assessed as providing excellent utility.
- Plans require additional detail and clarification rather than relying on implicit assumptions, cultural norms, and/or current business practices as these can differ significantly among different organizations.
- MAJMAR response plans should call for additional augmentation of staff where required (e.g., JRCC).
- Briefings should be led by those with appropriate SA; appropriate liaison officers or representatives from other organizations should participate either in person or via VTC.
- Internal linkages should be strengthened between EOCs (e.g., points of contact between RJOC(P) and JRCC should be well defined so that the staff knows who to talk to if they require information).
- There is a strong need to eliminate duplication of effort in collecting information; for instance RJOC(P) and JRCC were often looking for the same information. This applies particularly to the on-scene situational awareness and information about force disposition within JTTF and MARPAC regarding:
 - Fleet readiness;
 - Logistics and available stores;
 - Additional assets from other agencies; and
 - Other CAF capabilities within the region (army and navy reserves, air force).
- There were multiple requests for a vetted baseline knowledge repository, especially for the disposition of the CAF and other SAR assets, which speaks to the need for a shared SA (possibly a common operating picture) for all the JTTF/CAF components, as well as at an inter-agency level.

The over-reliance on technology, and resulting claimed performance degradation if the technology is not available, indicates that either the existing systems must be made sufficiently robust and that there is some redundancy in case of system degradation due to the nature or location of a possible incident, or that the staff receives sufficient training to be able to function

⁴ INCOMM (formerly known as 1709) is a Voice over IP communications system employed by the CCG to connect various CCG operations centres and SAR response units.



without these systems or when they are degraded. In addition, it would likely be useful if RJOC(P), JRCC Admin, EMBC, and BCEHS had access to receive information over the same communication means (i.e., INCOMM) as JRCC and CCG to enable them to maintain common situational awareness without the need to send RFIs.

There were also some common themes related to the exercise design:

- There was insufficient read-in and use of player handbooks and communications plan; players were briefed prior to exercise, but the short brief could not cover all of the guidance in the handbooks.
 - In some cases the players' roles and responsibilities were not clear.
 - The scope and limitations need to be made clearer (e.g., bounds of play and when to contact EXCON for more information needs to be explained explicitly).
- Just as for TTX, players made assumptions outside the scope of their role. Many of these assumptions were overly optimistic, and tended to simplify the response. This was more common at lower echelon levels. However, as was highlighted in the TTX report [1], the lack of realistic consideration of potential modes of failure for the MAJMAR event enabled a false sense of control over the outcome.
- There was lack of inputs from various parties (e.g., SAR response units). This was largely caused by the decision to keep the exercise at the operational level. However, it would have been beneficial to have included a simulation cell (representing at the minimum the scene and first response assets) that would provide more realism to the play by simulating tactical forces.

Potential media pressure, social media impact, and the effect of conflicting or false information was completely disregarded during the EOCX. Public affairs was mentioned only in passing during the Battle Update Brief. However, in the case of a real MAJMAR, there would likely be multiple flows of information, demands for information from media, and families of passengers, and overall media and public pressure on the participating agencies and their representatives. This media pressure would likely become hostile if there were perceive lack of official information flow, not to mention the potential loss of public confidence in a major social institution should the situation turn negative. In addition, as was noted above, this bottom up/lateral flow of information was not considered during the EOCX. It could and should be incorporated in future exercises via a simulation cell.

As a whole, the multi-agency response still suffers from a lack of understanding of the command and control (C2)⁵ structure across organizations, information flow and communications requirements. One recommendation from the TTX was to map/define the C2 structure (tasking ability), reporting chains (communications lines/means), and required timelines over the duration of the MAJMAR event. To this end, Figure C.1 shows a proposed⁶ summary of the C2 structure for the SAR portion of the MAJMAR developed by the MARPAC Operational Research team on the basis of available references and discussions with the participants from other government organizations.

Additionally, a clear understanding of overarching governance, the participating agencies, and applicable plans for emergency management in BC is necessary for all participants in order to grasp the framework in which the search and rescue response, consequence management, and environmental response is occurring. Relevant documents are available online [16]–[25].

⁵ Where C2 is defined loosely as the exercise of authority and direction by a properly designated individual over assigned resources in the accomplishment of a common goal. [15]

⁶ Note that this diagram is still under review, and is subject to change.

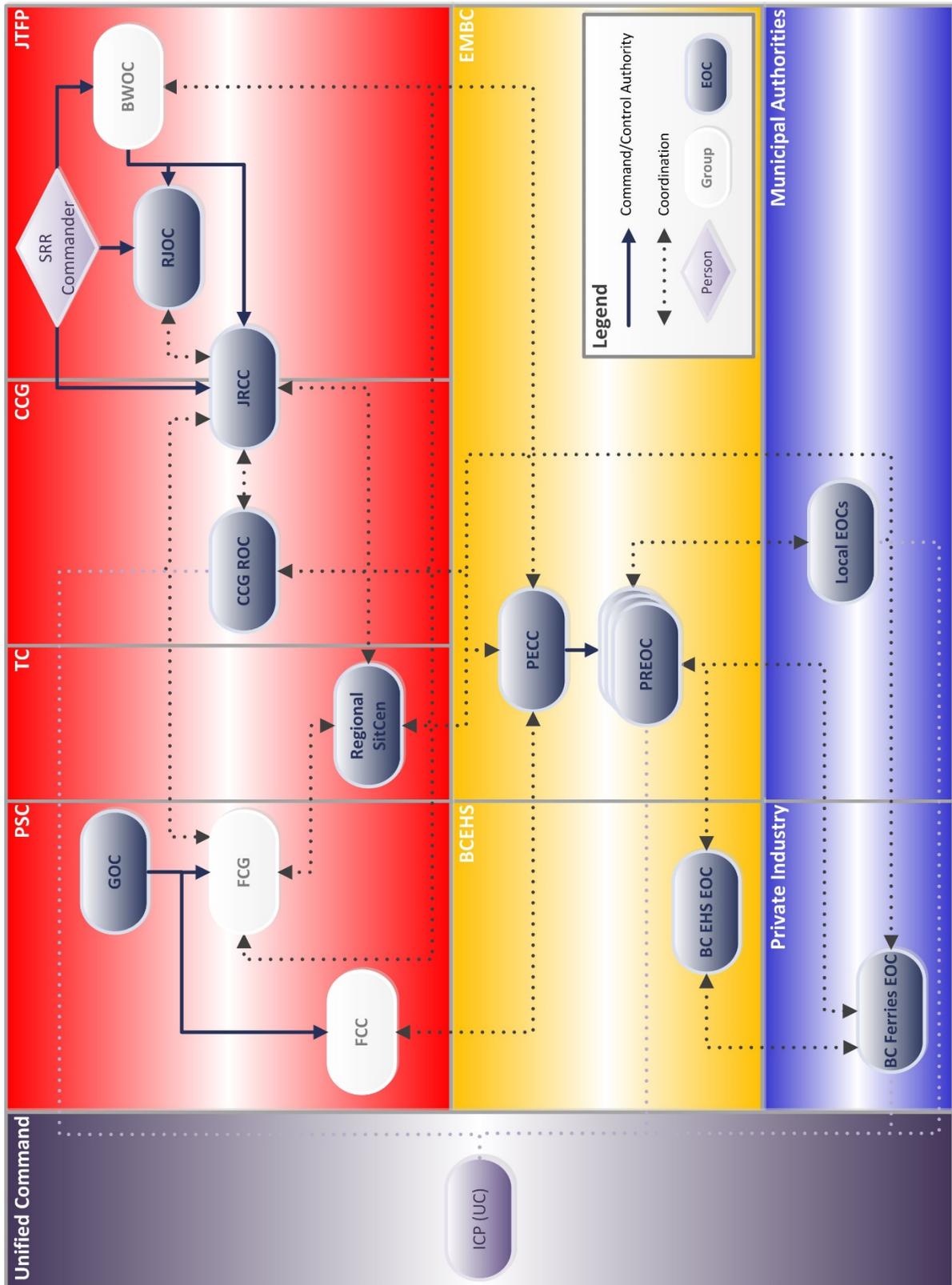


Figure C-1: Command and control relationships during the SAR phase of a major maritime disaster involving a BC ferry.

CAN UNCLASSIFIED

DOCUMENT CONTROL DATA		
(Security markings for the title, abstract and indexing annotation must be entered when the document is Classified or Designated)		
1. ORIGINATOR (The name and address of the organization preparing the document. Organizations for whom the document was prepared, e.g., Centre sponsoring a contractor's report, or tasking agency, are entered in Section 8.) DRDC – Centre for Operational Research and Analysis Defence Research and Development Canada 101 Colonel By Drive Ottawa, Ontario K1A 0K2 Canada	2a. SECURITY MARKING (Overall security marking of the document including special supplemental markings if applicable.) CAN UNCLASSIFIED	2b. CONTROLLED GOODS NON-CONTROLLED GOODS DMC A
3. TITLE (The complete document title as indicated on the title page. Its classification should be indicated by the appropriate abbreviation (S, C or U) in parentheses after the title.) Exercise SALISH SEA 2017: Evaluation of Emergency Operations Centre/Command Post Exercise		
4. AUTHORS (last name, followed by initials – ranks, titles, etc., not to be used) Dobias, P.; Eisler, C.		
5. DATE OF PUBLICATION (Month and year of publication of document.) September 2017	6a. NO. OF PAGES (Total containing information, including Annexes, Appendices, etc.) 19	6b. NO. OF REFS (Total cited in document.) 25
7. DESCRIPTIVE NOTES (The category of the document, e.g., technical report, technical note or memorandum. If appropriate, enter the type of report, e.g., interim, progress, summary, annual or final. Give the inclusive dates when a specific reporting period is covered.) Scientific Letter		
8. SPONSORING ACTIVITY (The name of the department project office or laboratory sponsoring the research and development – include address.) DRDC – Centre for Operational Research and Analysis Defence Research and Development Canada 101 Colonel By Drive Ottawa, Ontario K1A 0K2 Canada		
9a. PROJECT OR GRANT NO. (If appropriate, the applicable research and development project or grant number under which the document was written. Please specify whether project or grant.)	9b. CONTRACT NO. (If appropriate, the applicable number under which the document was written.)	
10a. ORIGINATOR'S DOCUMENT NUMBER (The official document number by which the document is identified by the originating activity. This number must be unique to this document.) DRDC-RDDC-2017-L311	10b. OTHER DOCUMENT NO(s). (Any other numbers which may be assigned this document either by the originator or by the sponsor.)	
11a. FUTURE DISTRIBUTION (Any limitations on further dissemination of the document, other than those imposed by security classification.) Public release		
11b. FUTURE DISTRIBUTION OUTSIDE CANADA (Any limitations on further dissemination of the document, other than those imposed by security classification.)		

CAN UNCLASSIFIED

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

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

command post exercise; communication flows; major maritime disaster' search and rescue