Defence Research and Development Canada
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Operational Research Support to Exercise SALISH SEA 2017

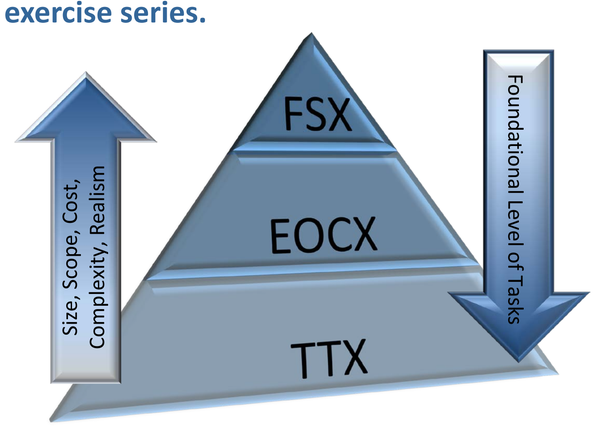
BACKGROUND

BC Ferries is the largest passenger ferry line in North America and one of the largest in the world, operating 36 vessels on 25 routes [1], serving 47 terminals along the coast of British Columbia (BC), Canada and over 14.5 million passengers annually. Passenger cruise ships also operate in the same waters. Thus, one of the most potentially dangerous events to occur in the Canadian territorial waters off the coast of BC would be a major maritime disaster (MAJMAR) involving a large capacity passenger vessel.

Inter-Agency MAJMAR Exercise Series

In order to exercise a multi-agency response to prepare for such an eventuality, key federal, provincial, municipal and other response partners met in 2015 to determine initial exercise scope and objectives. The result was a progressive series of exercises, dubbed Exercise SALISH SEA 2017 (EX SASE 17) [2]. On 25-27 October 2017, this series culminated in the largest multi-agency MAJMAR exercise in Canadian Coast Guard (CCG) history, with nearly 1,300 Canadian and United States emergency management and Search and Rescue (SAR) professionals from over 20 participating agencies, plus local volunteers, and nearly two dozen ships and aircraft. This live full scale exercise (FSX) concluded almost two years of planning effort that included a Table Top Exercise (TTX) in May 2017 and an Emergency Operational Centre Exercise (EOCX) in September 2017 (Figure 1).

Figure 1. Progressive "crawl, walk, run" exercise series.



Common themes that arose over the course of the exercise informed recommendations to shape the redefinition of both regional and federal contingency response plans.

Operational Research Involvement

The Commander of Maritime Forces Pacific (MARPAC)/Joint Task Force Pacific (JTFP) is also the SAR Region (SRR) Commander for the Pacific SAR Region. On his behalf, his Chief of Staff Plans and Operations requested the MARPAC Operational Research Team (ORT) to lead the exercise evaluation for JTFP [4], as well as coordinate evaluation between participating agencies.

MAJMAR EXERCISE ASSESSMENT FRAMEWORK

BC Ferry Motor Vessel (M/V) COASTAL RENAISSANCE declared a MAYDAY, reporting that it was carrying 1,385 passengers and 61 crewmembers. An evacuation order was issued. The ferry then stood station as one evacuation slide and one life raft was deployed. 97 live actors representing ferry passengers from JTFP were safely evacuated from the ferry. 200 additional volunteers simulated evacuated passengers on shore. The evacuated passengers were triaged and treated by first responders. SAR assets were engaged to simulate air, water, and ground SAR. Emergency Social Services were engaged to simulate the care and transport of non-injured passengers. Multiple federal, provincial, local and non-government Emergency Operations Centres coordinated information exchange in order to account for all ferry passengers.

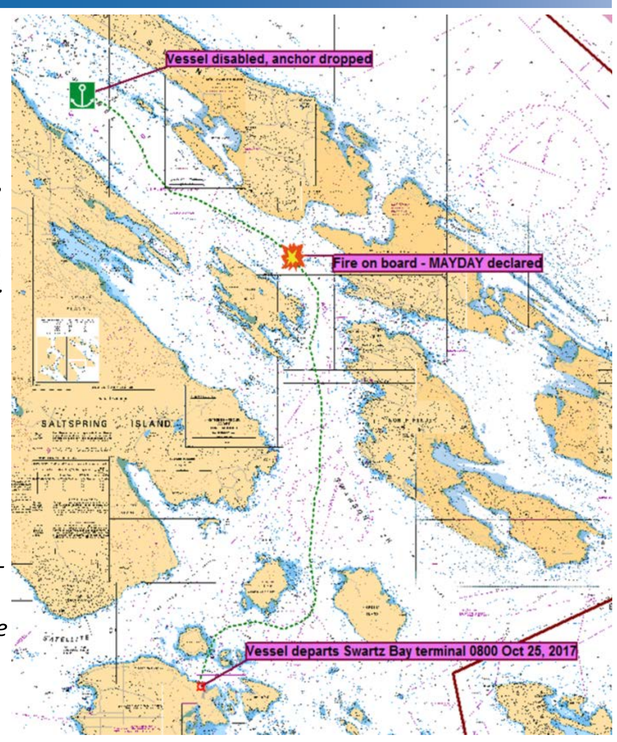


Figure 2. MAJMAR scenario [3].

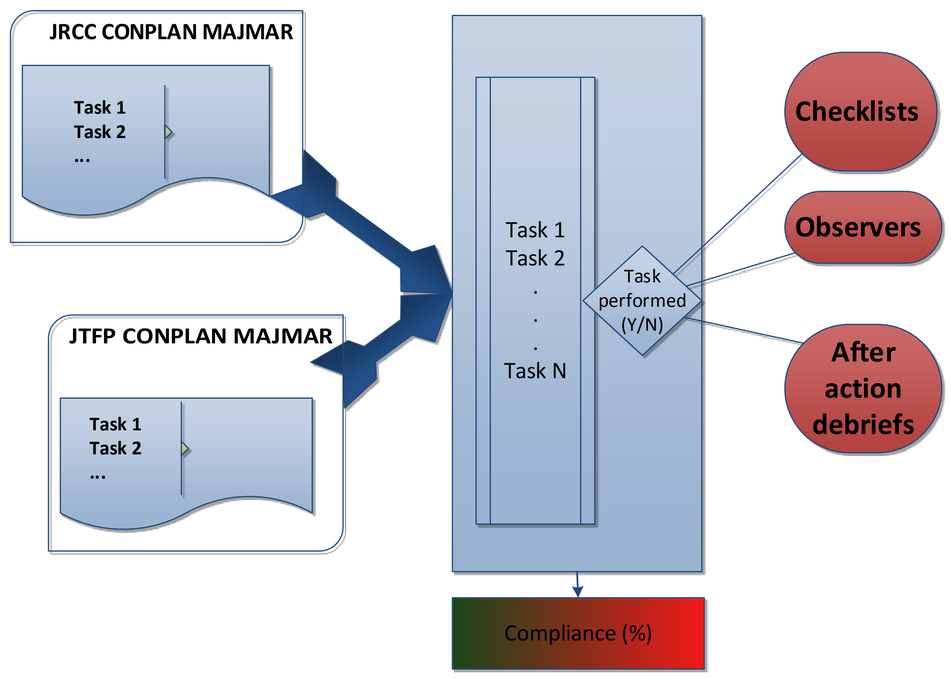
Assessment Framework and Observations

The following objectives were identified for the EX SASE 17 series [3]:

A. Validate compliance with following existing major marine disaster plans, and assess their interoperability.
B. Identify and validate casualty management processes;
C. Demonstrate ability to effectively share Situational Awareness (SA) and maintain a common operating picture (COP); and finally
D. Confirm the incorporation of lessons learned from previous major maritime disaster exercises or similar events.

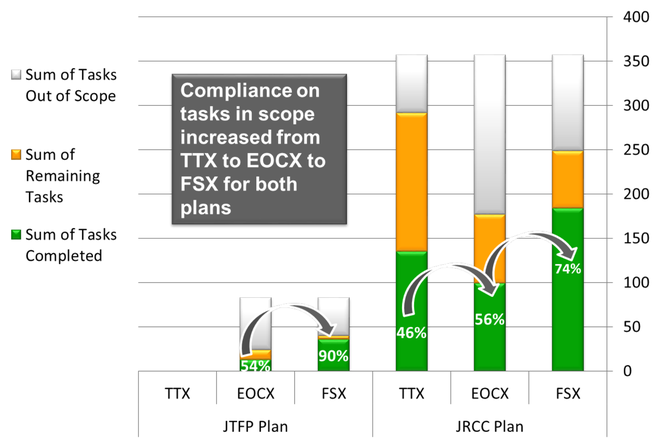
The ORT developed a quantitative assessment framework that mapped the participants' activities to the contingency plan (CONPLAN) mandated tasks (Figure 3). It also provided a framework employing pre-defined game cards for evaluating data flow, timeliness and COP coherence across the participating agencies. This assessment framework was incorporated into the actual scenario injects. This integration enabled robust assessment that was further strengthened by direct observations, as well as debriefing of participants. Lessons learned from these the TTX [4] and the EOCX [5] were then employed during the FSX.

Figure 3. Assessment of CONPLANS.



The exercise demonstrated that the need for a MAJMAR contingency plan was valid, and that the basic concepts outlined in the current plans provide a solid foundation for responding to a MAJMAR. On the other hand, the exercise also highlighted deficiencies and redundancies in the current plans. On a task-by-task basis, the compliance of the JRCC/JTFP with the existing plans between TTX, EOCX, and live FSX; as the participants became more aware of existing plans, the compliance increased (Figure 4).

Figure 4. JTFP*/JRCC compliance with MAJMAR plans (from [6]).



* JTFP CONPLAN not evaluated in TTX

This reinforces the overall observation that it is vital that this type of inter-agency exercises is conducted regularly.

FUTURE EXERCISE SUPPORT

The following were the recommendations made to the JTFP and JRCC organizations with regards to future exercises [6]-[7]:

- Deliver less detailed information ahead of FSX to participants in order to rely on information flow through appropriate communication channels.
- Maintain real-time/scenario timeline alignment by simulating any away time (e.g. overnight) in a multi-day exercise.
- Develop alternative scenario execution paths in case of events outside of exercise control.
- Utilize additional Table Top Wargames to examine highly challenging scenario variations that may be too difficult, expensive, or unsafe to perform in a live exercise, but are necessary to understand the full range of potential requirements.
- Use the same communications channels for any EOCX as the following FSX in order to test the communications plan.

The exercise series also proved the value of embedding the operational research team in the exercise planning from the initiation. The presence of the MARPAC ORT ensured that the defined objectives were specific and measurable, and that the assessment framework was aligned with the objectives. Hence it was recommended that future interagency exercises include integration of operational research support.

EX SASE 17 served to improve collective emergency management effectiveness, and building partnerships between principal agencies [3].

REFERENCES

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[4] Eisler, C. and P. Dobias, Exercise SALISH SEA 2017: Table Top Exercise, DRDC-RDDC-2017-L193, Jun 2017.

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