



Massachusetts Department of
Environmental Protection

First Responder Training and Geographic Response Strategy (GRS) Testing Exercise Series – Dartmouth Fire Department (D1 & D2)

After-Action Report/Improvement Plan

September 22, 2023

The After-Action Report/Improvement Plan (AAR/IP) aligns exercise objectives with preparedness doctrine and related frameworks and guidance. Exercise information required for preparedness reporting and trend analysis is included; users are encouraged to add additional sections as needed to support their own organizational needs.

EXERCISE OVERVIEW

Exercise Name	2023 Dartmouth Fire Department (D1 & D2) First Responder Training
Exercise Date	September 22, 2023
Scope	This was a full-scale exercise planned for approximately six hours at Apponagansett Point Recreation Area and upon the waters of Apponagansett Bay. Exercise play was limited to Apponagansett Bay and the adjacent shoreline.
Mission Area(s)	Prevention, Protection, Response
Capabilities	Environmental Response/Health and Safety, Operational Coordination, Operational Communications
Objectives	<p>Objective 1: Demonstrate the ability of local first responders to conduct initial response activities within the first 4-6 hours of an oil spill incident by deploying MassDEP oil spill response equipment and implementing common Geographic Response Strategy (GRS) tactics in alignment with the MassDEP GRS Tactics Guide.</p> <p>Objective 2: Demonstrate the ability of local first responders to establish and maintain command and control in the first 4-6 hours of an oil spill incident response by identifying relative health and safety hazards, developing an initial response organization, and communicating response objectives, strategies, and tactics through the completion of an Incident Briefing form (ICS 201) and the facilitation of an Operations and Safety Briefing.</p> <p>Objective 3: Demonstrate the ability of local first responders to effectively communicate information and actions between multiple local, state, and federal agencies within the first 4-6 hours of an oil spill incident by identifying a common UHF or VHF radio channel that can be utilized by all participants.</p>
Threat or Hazard	Discharge of oil into a navigable waterway
Scenario	An oil spill has occurred that threatens Apponagansett Bay. The Dartmouth Fire Department (D1 & D2) will utilize various Geographic Response Strategy (GRS) tactics to protect sensitive resources in Apponagansett Bay and the surrounding area.
Sponsor	Massachusetts Department of Environmental Protection (MassDEP)
Participating Organizations	<p>Participating organizations included:</p> <ul style="list-style-type: none"> • Dartmouth District 1 Fire Department • Dartmouth District 2 Fire Department • MassDEP • U.S. Coast Guard Sector Southeastern New England • Moran Environmental Recovery (MER) • Nuka Research <p>Note: See Appendix B for participant count</p>
Point of Contact	<p>Julie Hutcheson, Marine Oil Spill Prevention & Response Program Coordinator Massachusetts Department of Environmental Protection Oil Spill Prevention and Response Program 100 Cambridge St., Suite 900 Boston, MA 02114 (617) 366-7424 julie.hutcheson@mass.gov</p>

EXECUTIVE SUMMARY

Exercise Planning

In preparation for the Dartmouth First Responder exercise, both an Initial and Final Planning Meeting (IPM/FPM) were held with members of the Exercise Planning Team (EPT), which was comprised of personnel from each of the participating organizations listed in the Exercise Overview section.

Based on general direction provided by the EPT, and the overarching exercise scope and objectives mentioned above, the following deployment plans were developed:

- Complete first responder deployment drills; including the configuration of a shoreline anchor point, the deployment of 600-800 ft of boom in a cascading diversion array, and the deployment of a containment boom array at a nearby dock or mooring.

Exercise Conduct

Upon arrival at the deployment site on the day of the exercise, exercise controllers and senior participant personnel conducted a pre-deployment site survey to identify any limitations or obstructions that may impact the deployment plan outlined above. The following factors are typically observed and evaluated during this process:

- Wind speed and direction
- Tidal conditions, water depth, current speed and direction, and other water flow patterns
- Vessel traffic, mooring field density, and other deployment area limitations or obstructions

Based on the results of this site survey, there were no modifications to the initial deployment plan.

Participants practice connecting two sections of boom



Participants discuss the appropriate length of anchor line needed for marine anchor systems



Photos courtesy of Nuka Research & Planning Group

Participants gather for a Safety and Operations brief, beginning with an overview of deployment tactics and strategies



Participants offload boom to prepare for deployment



Photos courtesy of Nuka Research & Planning Group



Figure 1. Exercise Tactics Map

ANALYSIS OF CAPABILITIES

Aligning exercise objectives and capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned capabilities, and performance ratings for each capability as observed during the exercise and determined by the evaluation team.

Objective	Capability	Rating
Demonstrate the ability of local first responders to conduct initial response activities within the first 4-6 hours of an oil spill incident by deploying MassDEP oil spill response equipment and implementing common Geographic Response Strategy (GRS) tactics in alignment with the MassDEP GRS Tactics Guide.	Environmental Response Health and Safety	S
Demonstrate the ability of local first responders to establish and maintain command and control in the first 4-6 hours of an oil spill incident response by identifying relative health and safety hazards, developing an initial response organization, and communicating response objectives, strategies, and tactics through the completion of an Incident Briefing form (ICS 201) and the facilitation of an Operations and Safety Briefing.	Operational Coordination	S
Demonstrate the ability of local first responders to effectively communicate information and actions between multiple local, state, and federal agencies within the first 4-6 hours of an oil spill incident by identifying a common UHF or VHF radio channel that can be utilized by all participants.	Operational Communications	P
<p>Ratings Definitions:</p> <p>Performed without Challenges (P): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.</p> <p>Performed with Some Challenges (S): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.</p> <p>Performed with Major Challenges (M): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s), but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.</p> <p>Unable to be Performed (U): The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s).</p>		

Table 1. Summary of Core Capability Performance

The sections below provide an overview of the performance related to each exercise capability and the associated objectives, highlighting strengths and areas for improvement for each. Refer to page 4 for an overview of the objectives associated with each capability.

Capability 1: Environmental Response/Health and Safety

Strengths

The Partial capability level can be attributed to the following strengths:

Strength 1: Shoreside crews identified a shoreline anchor location (by tying anchor line to two trees near the deployment site) in an area that was above the high-water mark and was easily accessible to Apponagansett Bay for transfer of the anchor line to a work vessel.

Strength 2: Participants effectively coordinated operations between multiple vessels, including using a nearby dock and boat ramp to load marine anchor systems onto each vessel, and utilizing each vessel according to its capabilities to tow boom and set marine anchors (the 450 hp vessel acted as the primary towing and anchoring vessel, while the 60 hp Rigid Hull Inflatable Boat (RHIB) prepared support anchors and conducted shore-to-vessel transfer operations).

Strength 3: Participants worked well to quickly identify and successfully achieve tactical adjustments to the boom sections to maximize the effectiveness of the cascade boom configuration.

Areas for Improvement

The following areas require improvement to achieve the full capability level:

Area for Improvement 1: Participants initially prepared too much anchor line for the southern marine anchor on the second segment of the cascading diversion array, resulting in an insufficient amount of tension on this section of the array, and allowing the array to be pushed by wind and current.

Reference: MassDEP GRS Tactics Guide

Analysis: After initially dropping a series of marine anchors to secure the boom in place, vessel crews were notified by Command Staff that both boom segments had been shifted by current and winds. As a result of these shifts, the angle of the array was no longer effective for diverting oil to a shoreline recovery point. Vessel crews had to act quickly to modify the length of anchor line used in both sections by tying off excess slack, and then adjusting the placement of each anchor to decrease the angle relative to wind and current. For future exercise and operations, Command Staff should

Shoreside crews utilize two trees as a shoreline anchor point



Vessel crews set the southern marine anchor on the second section of the cascading diversion array



brief participants during the Safety and Operation brief on local conditions (i.e., water depths, winds, and current) that may impact deployment tactics and strategies, and responders should consider the recommendation to prepare anchor line that is 3 - 5 times the water depth.

Area for Improvement 2: Participants did not utilize enough marine anchor systems to deploy containment boom around a floating dock, resulting in an ineffective containment array.

Reference: MassDEP GRS Tactics Guide

Analysis: It is important to consider the number of anchors needed prior to engaging in on-water deployment activities. Participants should use a minimum of at least four marine anchor systems to improve the effectiveness of containment booming around a dock or a significantly sized vessel, with one anchor positioned at each “corner” of the containment area.

Participants configure containment boom around a floating dock



Capability 2: Operational Coordination

Strengths

The Partial capability level can be attributed to the following strengths:

Strength 1: The Incident Commander effectively coordinated participant roles and responsibilities and deployment tactics during the Operations briefing.

Strength 2: Despite resource limitations (no rebar available to configure a shoreline anchor system, and no heaving line to aid in shore-to-vessel transfer), shoreside crews successfully coordinated adjustments to properly anchor and transfer the boom to a nearby work vessel.

Shoreside crews assist with shore-to-vessel transfer



Areas for Improvement

The following areas require improvement to achieve the full capability level:

Area for Improvement 1: There was no formal Safety briefing held.

Reference: IC and SO Position Guides

Analysis: A Safety briefing should be held to ensure exercise operations are carried out safely and effectively throughout the on-water deployment. During these briefings, the SO can identify any relative safety hazards and coordinate the necessary safety measures and precautions with participants. Also, during this briefing, the SO can discuss local conditions (i.e., current, winds, and water depths) that may impact deployment tactics and strategies.

Area for Improvement 2: Coordination between Incident Command and work vessels was minimal after vessel crews completed the initial deployment of the cascading diversion array.

Reference: IC and SO Position Guides

Analysis: While the Incident Commander effectively coordinated participant roles and responsibilities and deployment tactics and strategies during the Operations briefing, additional guidance was needed throughout the deployment to help vessel crews coordinate the necessary adjustments to the marine anchors systems and modifications to the angles of the cascading diversion array to create an effective tactic. With more coordination from Incident Command, vessel crews may have noticed the shifting boom prior to leaving the immediate area and would have avoided any further delays in the deployment.

Capability 3: Operational Communications

Strengths

The Full capability level can be attributed to the following strengths:

Strength 1: Participants coordinated to determine the appropriate radio frequency to use during the exercise prior to engaging in on-water deployment activities.

Appendix A: IMPROVEMENT PLAN

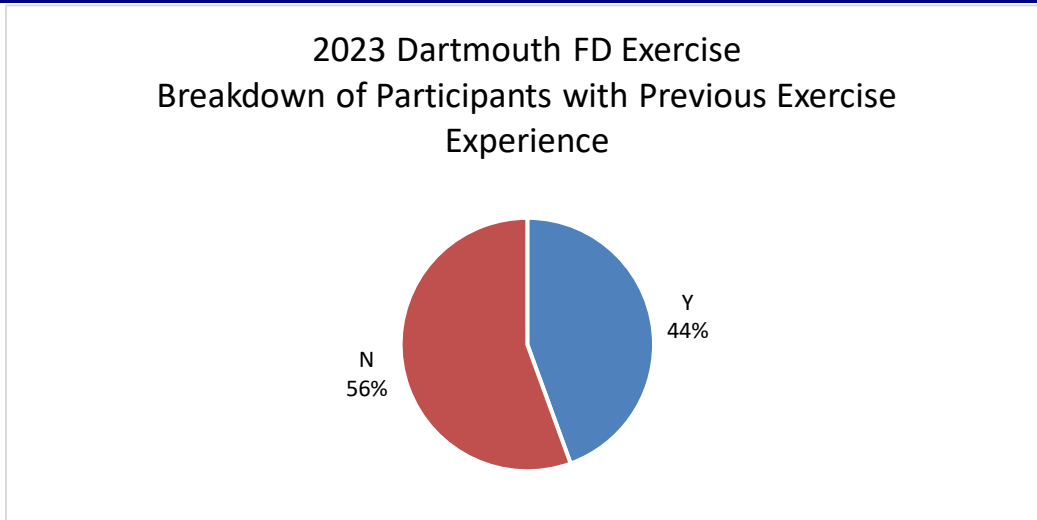
This IP is developed specifically for MassDEP, MER, Nuka Research and the Town of Dartmouth following the MassDEP First Responder Training and GRS Testing Exercise conducted on 22-Sep-23.

Capability	Issue/Area for Improvement	Corrective Action	Capability Element ¹	Primary Responsible Organization
Capability 1: Environmental Response	1. Participants initially prepared too much anchor line for the southern marine anchor on the second segment of the cascading diversion array, resulting in an insufficient amount of tension on this section of the array, and allowing the array to be pushed by wind and current.	During the Safety briefing, the SO should discuss water depths in the area surrounding the deployment location to assist responders with identifying and preparing the appropriate amount of anchor line.	Equipment/Systems	Towns/Cities with oversight by Exercise Controllers
Capability 1: Environmental Response	2. Participants did not utilize enough marine anchor systems while deploying containment boom around a floating dock, resulting in an ineffective containment array.	During the Operations briefing, responders should identify the appropriate number of marine anchors needed to deploy a successful containment array.	Training	Towns/Cities with oversight by Exercise Controllers
Capability 2: Operational Coordination	1. There was no formal Safety briefing held.	A Safety briefing should be held to identify and discuss local conditions and hazards that may impact the safety and effectiveness of deployment strategies and tactics.	Organization/Leadership	Towns/Cities with oversight by Exercise Controllers
Capability 2: Operational Coordination	2. Coordination between Incident Command and work vessels was minimal after vessel crews completed the initial cascading diversion array.	Command Staff should remain engaged through the deployment and provide guidance and direction as needed.	Organization/Leadership	Towns/Cities

¹ Capability Elements are: Planning, Organization and Leadership, Personnel, Equipment and Systems, Training, or Exercise

APPENDIX B: PARTICIPANTS & RESOURCES

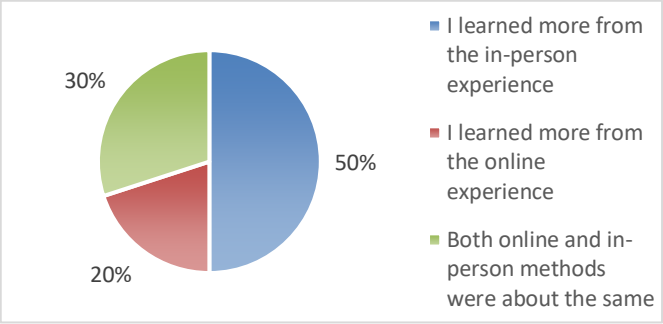
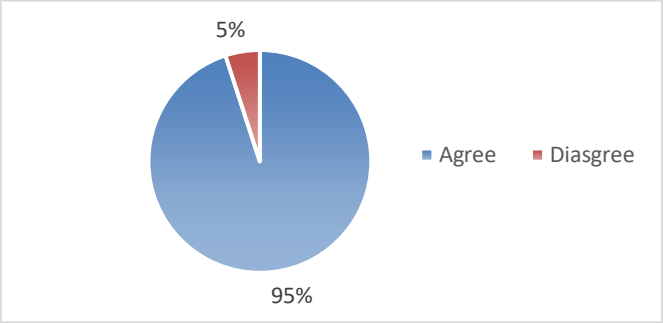
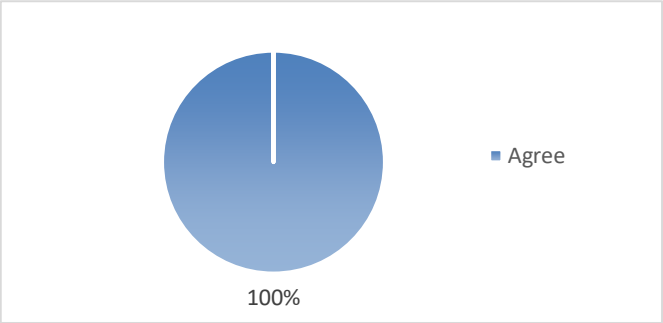
Participating Organizations	
Town of Dartmouth, MA	Participant Count
Dartmouth District 1 Fire Department	13
Dartmouth District 2 Fire Department	5
TOTAL TOWN/CITY PARTICIPANTS	18
Federal	
United States Coast Guard Sector Southeastern New England	4
State	
Massachusetts Department of Environmental Protection (MassDEP)	1
Nuka Research and Planning Group, LLC (contractor for MassDEP)	2
Moran Environmental Recovery (contractor for MassDEP)	3
TOTAL	28

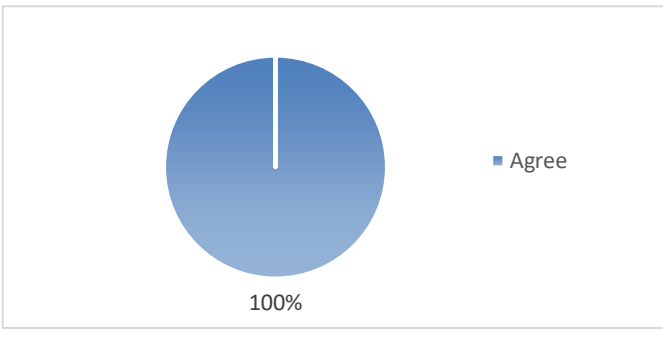
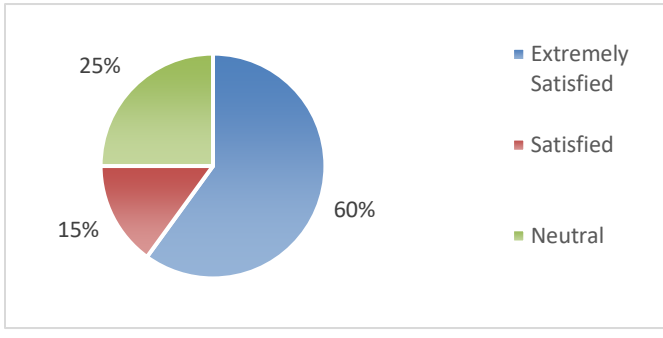
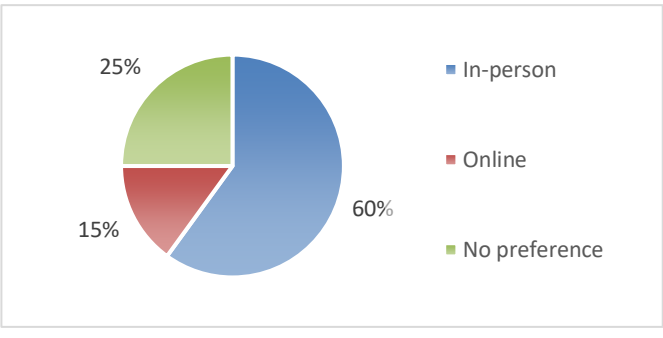


List of Resources			
Agency	Resource	Kind	Exercise Function
Dartmouth D1 FD	450 hp fire boat	Vessel	Boom Deployment
Dartmouth D1 FD	60 hp RHIB	Vessel	Support
Dartmouth D1 FD	MassDEP trailer	Equipment	Trailer Demonstration
Dartmouth D2 FD	MassDEP trailer	Equipment	Boom Deployment
MER	Drone	Equipment	Support

APPENDIX C: PARTICIPANT FEEDBACK

No participant feedback was collected at the conclusion of the exercise, however, with the online delivery of classroom training materials, participants were provided an online curriculum feedback survey. Online feedback survey questions and their associated feedback are included below.

Question	Results	Comments
<p>If you have previous experience participating in MassDEP GRS exercises, how would you compare your experience with classroom vs. online training?</p>	 <p>A pie chart with three segments: a blue segment representing 50% (I learned more from the online experience), a green segment representing 30% (Both online and in-person methods were about the same), and a red segment representing 20% (I learned more from the in-person experience).</p>	<p>N/A</p>
<p>Please rank whether you felt the length and pace of the online curriculum was effective for learning and knowledge retention.</p>	 <p>A pie chart with two segments: a large blue segment representing 95% (Agree) and a small red segment representing 5% (Disagree).</p>	<p>N/A</p>
<p>Information provided verbally in the online curriculum was both clear and concise.</p>	 <p>A pie chart with one segment: a blue segment representing 100% (Agree).</p>	<p>N/A</p>

Question	Results	Comments
<p>Information provided visually in the online curriculum appropriately supplemented verbalized content.</p>	 <p>A pie chart with a single blue slice representing 100%. A legend to the right shows a blue square next to the word 'Agree'.</p>	<p>N/A</p>
<p>Please rank your overall satisfaction with the online curriculum method and materials.</p>	 <p>A pie chart with three slices: a large blue slice (60%), a red slice (15%), and a green slice (25%). A legend to the right lists 'Extremely Satisfied' (blue), 'Satisfied' (red), and 'Neutral' (green).</p>	<p>N/A</p>
<p>In general, do you prefer in-person or online training?</p>	 <p>A pie chart with three slices: a large blue slice (60%), a red slice (15%), and a green slice (25%). A legend to the right lists 'In-person' (blue), 'Online' (red), and 'No preference' (green).</p>	<p>N/A</p>