



First Responder Training and Geographic Response Strategy (GRS) Testing Exercise Series – Duxbury/Marshfield

After-Action Report/Improvement Plan

May 9, 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 Duxbury/Marshfield FR Exercise
Exercise Date	May 9, 2023
Scope	This was a full-scale exercise planned for approximately six hours at Marshfield Town Landing in Marshfield and upon the waters of Green Harbor in Cut River. Exercise play was limited to Green Harbor and the adjacent shorelines.
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 Green Harbor and the adjacent shorelines. The Duxbury and Marshfield Fire Departments and Police Department/Harbormasters will utilize various Geographic Response Strategy (GRS) tactics to protect sensitive resources in Green Harbor and the surrounding area.
Sponsor	Massachusetts Department of Environmental Protection (MassDEP)
Participating Organizations	<p>Participating organizations included:</p> <ul style="list-style-type: none"> • Duxbury Fire Department • Duxbury Police/Harbormaster • Marshfield Fire Department • Marshfield Police/Harbormaster • 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>

Participants prepare marine anchor systems and anchor line



Participants practice tossing a heaving line



Photos courtesy of Nuka Research & Planning Group and Sean Maiorano Photography

Participants practice connecting sections of boom



Incident Commander LaSelva reviews roles and responsibilities prior to deployment



Photos courtesy of Nuka Research & Planning Group and Sean Maiorano Photography

EXECUTIVE SUMMARY

Exercise Planning

In preparation for the Duxbury/Marshfield 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:

- Deploy 250 ft of boom in an exclusion (EX) configuration to test the EX02 strategy in the South Shore (SS08) GRS (see snapshot included in **Figure 1** below)

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, the following limiting conditions were noted, leading to modifications to the initial deployment plan:

- Shallow water depths around the inlet to Green River (tide-related), impacting vessel maneuverability in the immediate area
- Strong northerly winds that would have pushed any deployed oil surrogate southward and against the flood tide, making it impossible to effectively test the EX02 strategy

The following modified deployment activities were completed:

- Deploy 200 ft of a cascading diversion (DV) configuration from the Marshfield town landing boat ramp



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	Ratings
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 following sections provide an overview of the performance related to each exercise objective and associated capability, highlighting strengths and areas for improvement.

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.

The strengths and areas for improvement for each capability aligned to this objective are described in this section.

Capability 1: Environmental Response/Health and Safety

Strengths

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

Strength 1: Participants utilized a nearby concrete mooring system along the shoreline's high-water mark to effectively configure a shoreside anchor system in a location that was suitable for retrieving, towing, and deploying boom.

Strength 2: Despite encountering strong northerly winds and several potential obstructions (a nearby pier and boat traffic), participants appropriately adjusted booming tactics to deploy a modified cascading diversion array.

Areas for Improvement

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

Area for Improvement 1: Vessels and vessel crews initially anchored the first section of the cascade diversion array too closely to a nearby fishing pier and docked vessels.

Reference: MassDEP GRS Tactics Guide

Analysis: While engaging in boom towing operations, vessel crews initially positioned the western marine anchor too closely to the end of a nearby fishing pier, resulting in boom being impacted by current and catching a docked vessel at the end of the pier. After making several adjustments to the anchor to keep boom away from the pier, vessel crews were able to successfully configure the cascading diversion array. While this brief misstep did not have immediate impacts on the boom array or the movement of local boat traffic, participants should consider the effects of wind and current during future marine anchor deployment operations to expedite deployment of booming strategies and prevent potential impacts.

Area for Improvement 2: Vessel crews did not initially load the appropriate number of marine anchors onto their vessel prior to engaging in towing operations.

Reference: MassDEP GRS Tactics Guide

Analysis: Prior to initiating on-water deployment activities, command staff was observed to be unclear on the number of resources needed to deploy the intended tactics. This resulted in some confusion following the Operations and Safety briefing over how many marine anchor systems were needed on each vessel. While command staff eventually recognized that an additional marine anchor was needed to effectively anchor the

second section of boom, and vessel crews were quickly able to transit back to the town landing to retrieve an additional anchor, this brief pause in towing operations could have ultimately been avoided.

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.

The strengths and areas for improvement for each capability aligned to this objective are described in this section.

Capability 2: Operational Coordination

Strengths

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

Strength 1: Command staff worked well to redirect exercise operations by coordinating modifications to boom deployment tactics and strategies to maximize the use of on-water resources.

Strength 2: The Incident Commander assigned a Resources Unit Leader to direct and oversee the utilization of resources during the deployment and during demobilization.

Areas for Improvement

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

Area for Improvement 1: Although a comprehensive operations and safety brief was held, some participants did not have a clear understanding of their role in the exercise or the intended tactics to be deployed.

Reference: Exercise Specific ICS-201

Analysis: It was shared during the exercise Hot Wash that there was some confusion pertaining to the intended deployment tactics, resource needs, and general roles and responsibilities of some personnel. As a result, the delivery of the Operations and Safety brief was identified as an area for future improvement. For future briefs, the exercise planning team should remain engaged with command staff to provide additional guidance pertaining to deployment resource needs and tactics, to further explain when and why adjustments need to be made, and to ensure a collective understanding of these plans prior to further communicating this information. Utilization of additional visual aids is also recommended.

Area for Improvement 2: Vessel crews initially struggled to identify the appropriate method to tow boom from the raised side of the town landing pier.

Reference: Exercise-Specific ICS-201

Analysis: There was some confusion amongst participants as to whether it would be best to tow the second section of boom with one end trailing through the water, or with both ends on board the towing vessel. After a lengthy debate, it was decided to tow boom with one end of trailing through the water. To avoid confusion relating to towing boom from raised pier surfaces, the exercise planning team should consider delivering additional classroom instruction further explaining the pros and cons of each towing method.

Objective 3: Demonstrate the ability to effectively communicate between multiple local, state, and federal agencies including fire, police and harbormaster departments using VHF and UHF communications

The strengths and areas for improvement for each capability aligned to this objective are described in this section.

Capability 3: Operational Communications

Strengths

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

Strength 1: Participants from all agencies coordinated prior to on-water deployment to determine the appropriate radio frequencies, then utilized radios appropriately to communicate deployment tactics and adjustments.

Shoreside anchor crews assist on-water vessels in towing boom to the deployment site



Vessel crews tow the second leg of boom towards the deployment site



Two vessel crews coordinate to position marine anchors on both sides of the second leg of boom



Participants adjust the positioning of a marine anchor to avoid interference with local boat traffic



Photos courtesy of Nuka Research & Planning Group and Sean Maiorano Photography

APPENDIX A: IMPROVEMENT PLAN

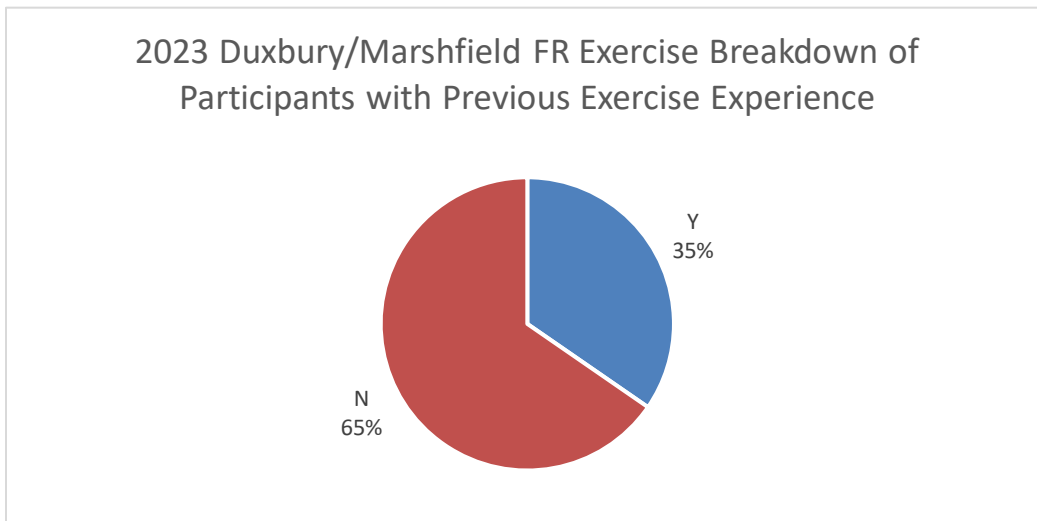
This IP is developed specifically for MassDEP, MER, Nuka Research and the Towns of Duxbury and Marshfield as a result of the MassDEP GRS Testing and First Responder Training Exercise conducted on 09-May-23.

Capability	Issue/Area for Improvement	Corrective Action	Capability Element ¹	Primary Responsible Organization
Capability 1: Environmental Response	Vessels and vessel crews initially anchored the first section of the cascade diversion array too closely to a nearby fishing pier and docked vessels.	Exercise facilitators encourage participants to designate personnel to monitor boom while deploying anchor systems or assign another support vessel to provide guidance to avoid obstructions and overcome challenges while conducting anchoring operations.	Organization/Leadership	Fire Departments and Harbormasters
Capability 1: Environmental Response	Vessel crews did not initially load the appropriate number of marine anchors onto their vessel prior to engaging in towing operations.	Exercise facilitators provide additional guidance to command staff prior to the Safety and Operational Brief so they can detail the equipment needed to properly deploy and configure the intended booming strategy.	Organization/Leadership	Fire Departments and Harbormasters
Capability 2: Operational Coordination	Although a comprehensive operations and safety brief was held, some participants did not have a clear understanding of their role in the exercise or the intended tactics to be deployed.	Exercise facilitators encourage command staff to assign roles and responsibilities during the Safety and Operational brief and assist command staff in the process of detailing the reasoning behind strategy and tactic adjustments.	Organization/Leadership	Fire Departments and Harbormasters
Capability 2: Operational Coordination	Vessel crews initially struggled to identify the appropriate method to tow boom from the raised side of the town landing pier.	Exercise facilitators revise classroom materials to include additional guidance for selecting the appropriate towing methods in a variety of scenarios.	Training	Nuka Research

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

APPENDIX B: PARTICIPANTS & RESOURCES

Participating Organizations	
Town of Duxbury, MA	Participant Count
Duxbury Fire Department	11
Duxbury Police/Harbormaster	3
Town of Marshfield, MA	
Marshfield Fire Department	5
Marshfield Police/Harbormaster	7
TOTAL TOWN/CITY PARTICIPANTS	26
Federal	
United States Coast Guard Sector Boston	2
State	
Massachusetts Department of Environmental Protection (MassDEP)	2
Nuka Research and Planning Group, LLC (contractor for MassDEP)	3
Moran Environmental Recovery (contractor for MassDEP)	3
TOTAL	36

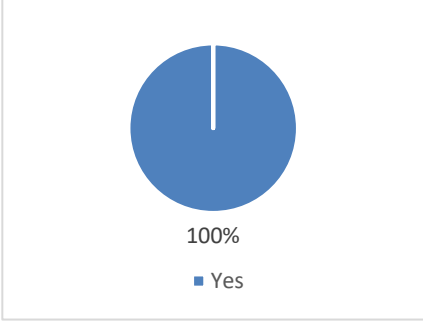
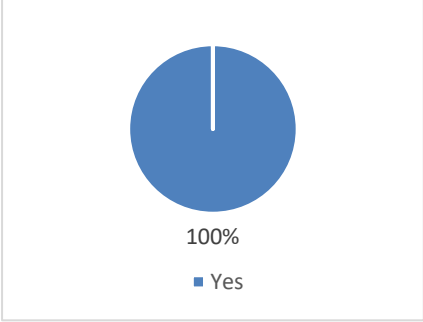
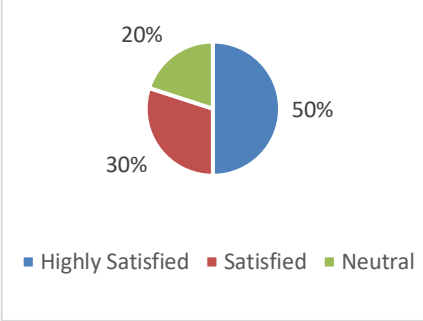


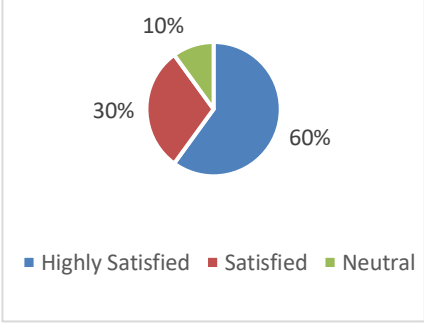
List of Resources			
Agency	Resource	Kind	Exercise Function
Marshfield FD	12' Inflatable	Vessel	Safety
Marshfield HM	23' Utility boat	Vessel	Boom Deployment
Duxbury FD	18' Center Console	Vessel	Boom Deployment
Duxbury FD	14' Inflatable	Vessel	Support
Duxbury HM	23' Carolina Skiff	Vessel	Demo
Duxbury FD	Oil spill response trailer	Trailer	Demo
Marshfield FD	Oil spill response trailer	Trailer	Deployment

APPENDIX C: PARTICIPANT FEEDBACK

Participants are encouraged to provide their feedback at the conclusion of each exercise by completing a participant feedback survey provided through Google Forms. The first two yes/no questions, as seen below, gather feedback from participants on the perceived success and effectiveness of the exercise. The following two questions use a satisfaction scale (Very Satisfied, Satisfied, Neutral, Unsatisfied, Very Unsatisfied) to gather feedback on each participant’s level of satisfaction with the course and the training experience.

In some instances, participating exercise towns/cities may opt for the online delivery of classroom training materials. In these instances, exercise participants will be provided with an online curriculum feedback survey. Online feedback survey questions and their associated feedback are also included in this section if applicable.

Question	Results	Comments
Do you have a better understanding of spill response techniques and tactics than you did before this training?	 <p>A pie chart representing 100% of responses. The entire circle is colored blue. Below the chart, the text '100%' is displayed, followed by a legend with a blue square and the label 'Yes'.</p>	
Do you feel more prepared to respond to an oil spill than you did before this exercise?	 <p>A pie chart representing 100% of responses. The entire circle is colored blue. Below the chart, the text '100%' is displayed, followed by a legend with a blue square and the label 'Yes'.</p>	
Please rank your overall satisfaction with the structure and length of this training.	 <p>A pie chart showing three segments: a blue segment for 50%, a red segment for 30%, and a green segment for 20%. Below the chart, a legend identifies the colors: blue for 'Highly Satisfied', red for 'Satisfied', and green for 'Neutral'.</p>	<ul style="list-style-type: none"> • Need more time for on -water training • Need more staff to direct shoreside operations

Question	Results	Comments								
<p>How would you rate your overall learning experience?</p>	 <table border="1"> <caption>Survey Results Data</caption> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Highly Satisfied</td> <td>60%</td> </tr> <tr> <td>Satisfied</td> <td>30%</td> </tr> <tr> <td>Neutral</td> <td>10%</td> </tr> </tbody> </table>	Category	Percentage	Highly Satisfied	60%	Satisfied	30%	Neutral	10%	
Category	Percentage									
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