First Responder Training and Geographic Response Strategy (GRS) Testing Exercise Series – Brewster/Dennis

After-Action Report/Improvement Plan

October 3, 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 Brewster/Dennis First Responder Training
Exercise Date	October 3, 2023
Scope	This was a full-scale exercise planned for approximately six hours at Sesuit Harbor East and upon the waters of Sesuit Harbor. Exercise play was limited to Sesuit Harbor and the adjacent shoreline.
Mission Area(s)	Prevention, Protection, Response
Capabilities	Environmental Response/Health and Safety, Operational Coordination, Operational Communications
Objectives	**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. **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. **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.
Threat or Hazard	Discharge of oil into a navigable waterway
Scenario	An oil spill has occurred that threatens Sesuit Harbor. The Brewster and Dennis Fire Departments and Harbormasters will utilize various common Geographic Response Strategy (GRS) tactics to protect sensitive resources in Sesuit Harbor and the surrounding area.
Sponsor	Massachusetts Department of Environmental Protection (MassDEP)
Participating Organizations	Participating organizations included: • Brewster Fire Department • Brewster Harbormaster • Dennis Fire Department • Dennis Harbormaster • Dennis Public Health • Barnstable County Incident Management Team (IMT) • Massachusetts Department of Fire Services Rehab Unit • MassDEP • U.S. Coast Guard Sector Southeastern New England • Moran Environmental Recovery (MER) • Nuka Research ***Note: See Appendix B for participant count***

Exercise Name	2023 Brewster/Dennis First Responder Training
Point of Contact	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

EXECUTIVE SUMMARY

Exercise Planning

In preparation for the Brewster/Dennis 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 many 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 and the deployment of 600-800 ft of boom in a cascading diversion array (see **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
- Available resources and resource limitations

Based on the results of this site survey, the following limiting conditions were noted, leading to modifications to the initial deployment plan:

- The original shoreline anchoring location was determined not to be ideal for configuring 600-800 ft of a cascading diversion array due to shallow waters in the surrounding area, and because the channel was narrower than initially anticipated.

As a modification to the initial deployment, the following deployment activities were completed:

- Deploy 200 ft of a shortened cascading diversion (DV) array from a shoreside anchor location further north along the beach on the eastern side of the harbor.

Participants practice throwing a heaving line

Participants learn about the different sorbent booms and their functions

Photos courtesy of Nuka Research & Planning Group

Participants practice configuring a double rebar shoreside anchor point

Participants learn about the different boom components and practice connecting sections of boom

Photos courtesy of Nuka Research & Planning Group

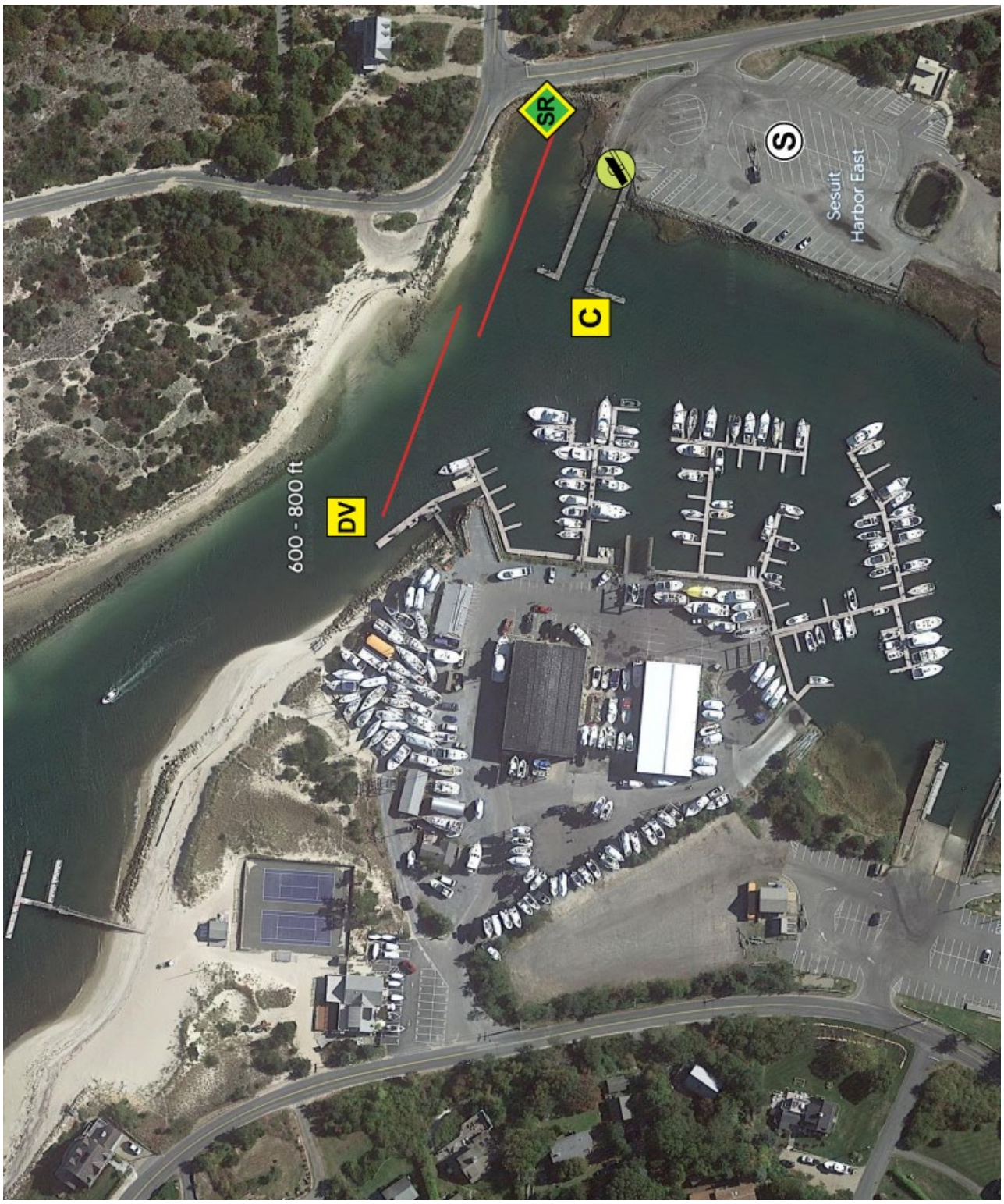


Figure 1. Exercise Tactics Map

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

Ratings Definitions:

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.

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.

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.

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).

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: Crews successfully conducted boom offloading operations despite several delays due to ongoing vessel trailering activity at the boat ramp, then successfully towed boom through the nearby channel despite vessel traffic in the area.

Strength 2: Participants utilized vessels according to their capabilities to tow boom, set marine anchors, and monitor safety.

Areas for Improvement

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

Area for Improvement 1: Vessel crews responsible for deploying the first leg of boom initially used heaving line to tow boom from the boat ramp to the shoreside anchor point.

Reference: MassDEP GRS Tactics Guide

Analysis: Heaving lines are meant to be used as an aid for transferring boom from a vessel to crews along the shore, and vice versa. They are not rated for towing operations, and therefore aren't safe to use as a towing line. For future responses and exercises, vessel and shoreline crews should coordinate the use of a towing bridle by connecting the bridle to the end of a section of boom and attaching it to the appropriate length of polypropylene towing line prior to engaging in towing operations.

Crews attach a towing bridle to one end of boom prior to attaching it to the shoreside anchor point

Vessel crew throws a heaving line to the shoreside crew to transfer the first boom section

Area for Improvement 2: Participants initially prepared too much polypropylene line for the marine anchor on the first section of the cascading diversion array and for the southern marine anchor on the second segment of the array.

Reference: MassDEP GRS Tactics Guide

Analysis: After initially dropping a series of marine anchors to secure both segments of the diversion array in place, participants noticed that each segment began to shift towards the shore. As a result, the cascading diversion array became ineffective for diverting oil to the designated recovery point (as shown in the picture above). After noticing this, Command Staff directed vessel crews to adjust several marine anchor systems with

the objective of decreasing the angle of each array relative to the current. What Command Staff didn't recognize is that the boom had shifted because marine anchors were not setting due to too much anchor line. After vessel crews adjusted the placement of each marine anchor, they discovered that the length of the anchor line was the root cause of the issue. For future response and exercises, vessel crews should discuss water depths and modify the length of anchor line according to this information. If there is still too much anchor line, crews can tie off any excess slack. Also, on-water conditions (such as water depths) should be briefed by Command Staff during the Safety and Operation brief.

Area for Improvement 3: Shoreside anchoring crews initially staged in the wrong location several hundred feet north of the intended shoreside anchor location.

Analysis: Although Command Staff discussed shoreside anchor crew roles and responsibilities during the Safety and Operations briefing and utilized a visual aid to guide crews towards the proper anchor location, there was miscommunication over where exactly these crews needed to stage. After Command Staff realized that shoreside crews staged north of the intended anchor location, they communicated with these crews to relocate to the proper location prior to configuring the shoreside anchor point. Although this minor misstep had no impact on the overall success of the exercise, it did influence the timely deployment of the boom array.

Capability 2: Operational Coordination

Vessel crew adjusts the angle of the first section of boom

Strengths

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

Strength 1: Incident Command and the Incident Management Team worked well together to coordinate and communicate the delegation of participant roles and responsibilities during the Safety and Operations briefing.

Strength 2: A safety vessel was designated to monitor operations for safety.

Areas for Improvement

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

Area for Improvement 1: Despite reminders from Exercise Controllers prior to the Safety and Operations briefing, there was no formal Safety briefing held.

Reference: IC/SO Position Guide

Analysis: A Safety briefing should be held prior to on-water deployment to ensure participants are made aware of all safety hazards and have an opportunity to discuss on-water conditions (i.e., current, wind, water depths) to ensure exercise operations are carried out both safely and effectively. During this briefing, the Safety Officer should identify and discuss how these local conditions and hazards may impact deployment activities to prepare participants for taking the necessary precautions prior to engaging in operations. If a Safety briefing was held, participants may have had an opportunity to discuss the role water depths play in preparing anchor line and any other precautions related to avoiding nearby recreational boating activity.

Area for Improvement 2: Vessel crews did not effectively coordinate adjustments to marine anchors once it was recognized that both segments of boom had shifted towards the shoreline.

Reference: MassDEP GRS Tactics Guide

Analysis: Although vessel crews were eventually able to conclude that the length of anchor line was the primary reason for boom segments not setting properly, this came after several failed attempts to identify and fix the issue through adjustments to marine anchors. For future responses and exercises utilizing drones, Command Staff should closely monitor drone footage to oversee operations and provide guidance based on these observations. If Command Staff had been monitoring drone footage at the time of the deployment, they may have had an opportunity to notice the anchors not setting and could have avoided unnecessary anchor adjustments made by vessel crews. Additionally, while working vessels are engaging in boom deployment and anchoring operations, support vessels should play an active role in monitoring these activities from afar to provide additional guidance and direction.

Capability 3: Operational Communications

Strengths

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

Strength 1: Participants coordinated with the Incident Management Team and Command staff to determine the appropriate radio frequencies to use during the exercise prior to engaging in on-water deployment activities, using two radio frequencies: one to communicate during the deployment, and another to monitor the radio activity of recreational traffic transiting in and out of the harbor.

Appendix A: IMPROVEMENT PLAN

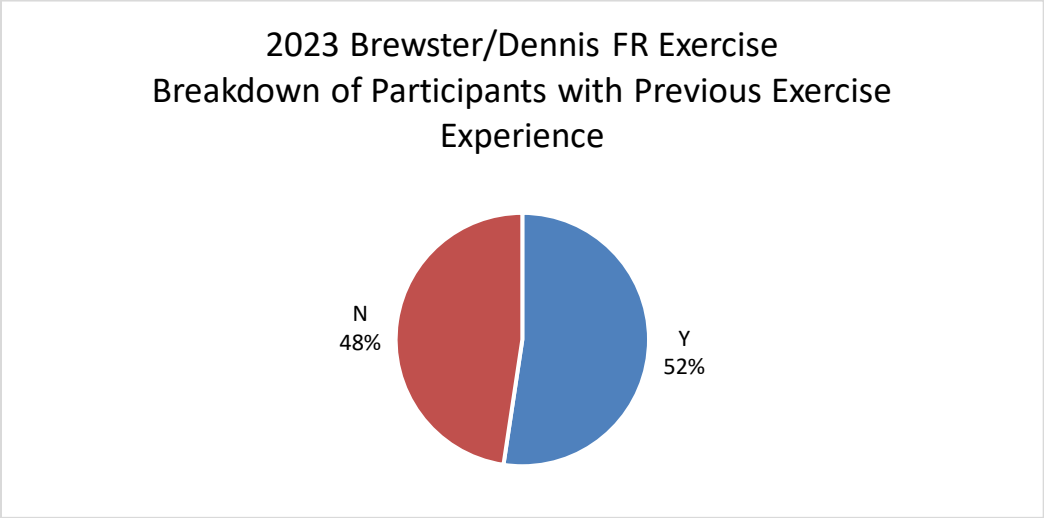
This IP is developed specifically for MassDEP, MER, Nuka Research and the Towns of Brewster and Dennis following the MassDEP First Responder Training and GRS Testing Exercise conducted on 03-Oct-23

Capability	Issue/Area for Improvement	Corrective Action	Capability Element[1]	Primary Responsible Organization
Capability 1: Environmental Response	1. Vessel crews responsible for deploying the first leg of boom initially used heaving line to tow boom from the boat ramp to the shoreside anchor point.	Deployment tactics and strategies (including resource needs) should be communicated during the Operations briefing.	Equipment/Systems	Towns/Cities & with oversight by Exercise Controllers
Capability 1: Environmental Response	2. Participants initially prepared too much polypropylene line for the marine anchor on the first section of the cascading diversion array and for the southern marine anchor on the second segment of the array.	During the Safety briefing, the SO should identify and discuss hazards and conditions that may impact deployment tactics and strategies.	Equipment/Systems	Towns/Cities & with oversight by Exercise Controllers
Capability 1: Environmental Response	3. Shoreside anchoring crews initially staged in the wrong location several hundred feet north of the intended shoreside anchor location.	Deployment tactics and strategies should be communicated during the Operations briefing.	Organization/Leadership	Towns/Cities & with oversight by Exercise Controllers
Capability 2: Operational Coordination	1. Despite reminders from Exercise Controllers prior to the Safety and Operations briefing, there was no formal Safety briefing held.	A Safety briefing should be held to ensure the safe and effective deployment of GRS tactics and drills.	Organization/Leadership	Towns/Cities & with oversight by Exercise Controllers
Capability 2: Operational Coordination	2. Vessel crews did not effectively coordinate adjustments to marine anchors once it was recognized that both segments of boom had shifted towards the shoreline.	Command Staff should actively monitor operations throughout deployment to 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 Brewster, MA	**Participant Count**
Brewster Fire Department	5
Brewster Harbormaster	3
Town of Dennis, MA	
Dennis Fire Department	11
Dennis Harbormaster	1
Dennis Public Health	1
TOTAL TOWN/CITY PARTICIPANTS	21
County	
Barnstable County Incident Management Team (IMT)	4
Federal	
United States Coast Guard Sector Southeastern New England	2
State	
Massachusetts Department of Environmental Protection (MassDEP)	1
Nuka Research and Planning Group, LLC (contractor for MassDEP)	2
Moran Environmental Recovery (contractor for MassDEP)	2
Department of Fire Services Rehab Unit	2
TOTAL	33

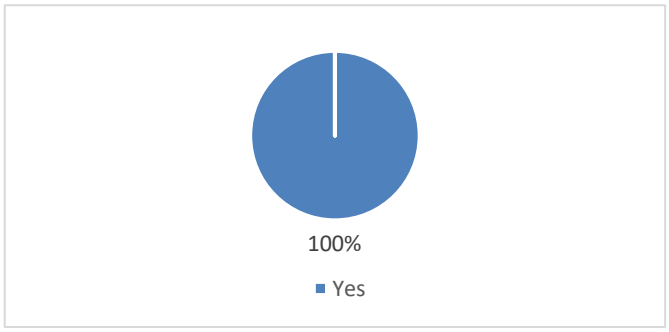
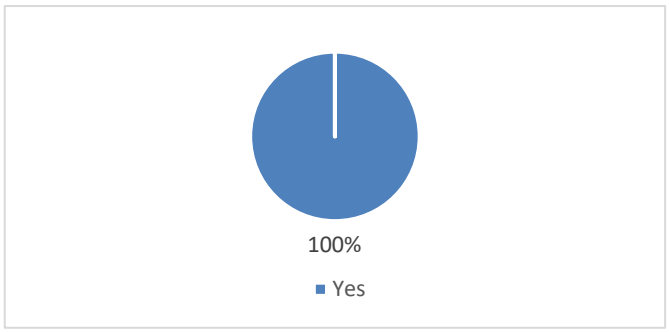
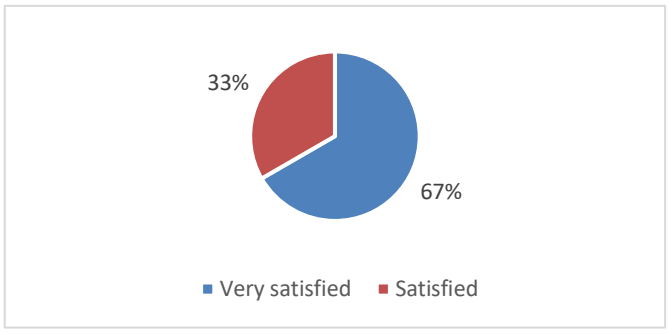


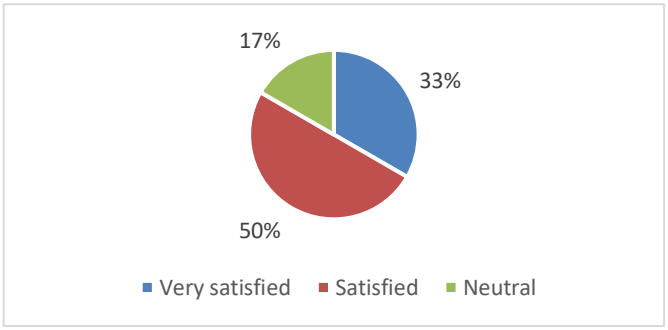
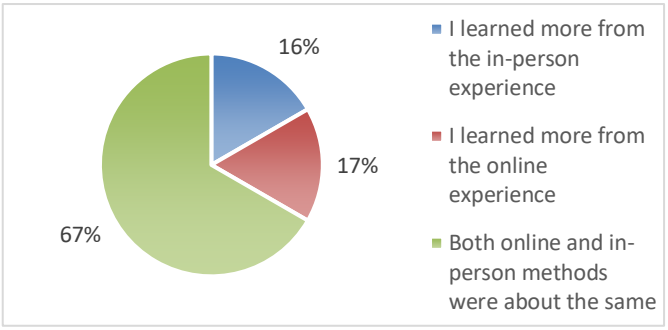
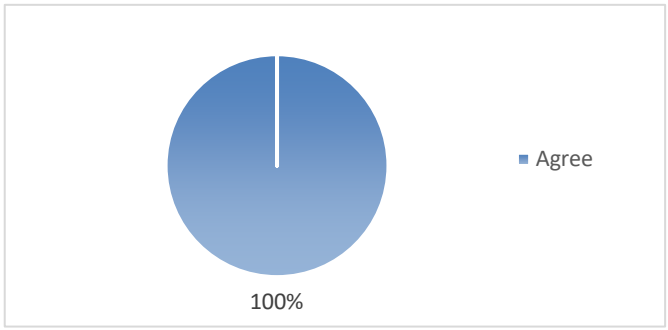
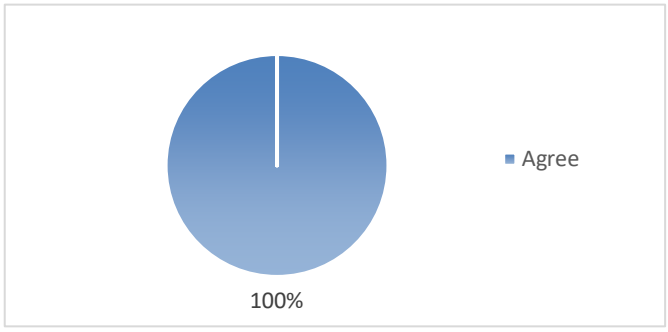
List of Resources			
Agency	**Resource**	**Kind**	**Exercise Function**
Dennis Fire Department	Trailer	Equipment	Trailer Demonstration
Brewster Fire Department	Trailer	Equipment	Boom Deployment
Dennis Harbormaster (#1)	20-25ft response boat	Vessel	Safety
Dennis Fire Department	25hp RHIB	Vessel	Support
Dennis Fire Department (#119)	Center console	Vessel	Boom Deployment
Brewster Fire Department (#246)	17ft Whaler	Vessel	Boom Deployment
Sandwich FD	Drone	Apparatus	Support
Barnstable County Incident Management Team	Exercise Support	Apparatus	Support
DFS Rehab Unit	Exercise Support	Vehicle	Support

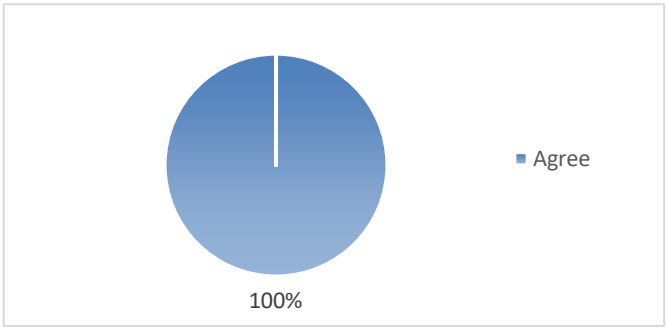
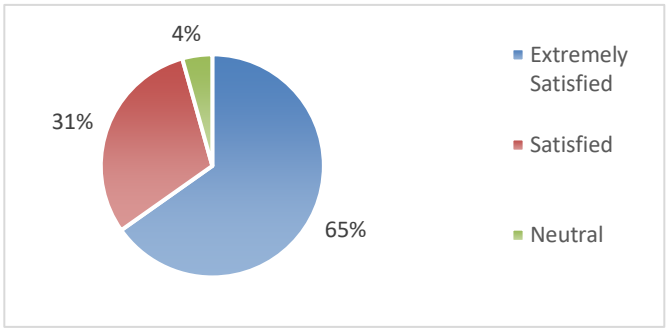
APPENDIX C: PARTICIPANT FEEDBACK

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?		
Do you feel more prepared to respond to an oil spill than you did before this exercise?		Need to have this training at least 1x per calendar year
Please rank your overall satisfaction with the structure and length of this training.		Need more practice and more evoluton time for deployment activities

Question	Results	Comments
How would you rate your overall learning experience?		Need more hands-on activities for those not directly involved in deployment
If you have previous experience participating in MassDEP GRS exercises, how would you compare your experience with classroom vs. online training?		
Please rank whether you felt the length and pace of the online curriculum was effective for learning and knowledge retention.		Classroom curriculum was very helpful
Information provided verbally in the online curriculum was both clear and concise.		

Question	Results	Comments
Information provided visually in the online curriculum appropriately supplemented verbalized content.		
Please rank your overall satisfaction with the online curriculum method and materials.		
In general, do you prefer in-person or online training?