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Module 1 - Introduction

North Shore GRP Exercise Marblehead, MA

MassDEP

May 25th, 2016

Administrative Remarks

- Sign-In
- Restrooms
- Cell phones/Radios
- Coffee/Snacks/Lunch
- Safety and Emergency Information



Exercise Objectives

- Establish and maintain a unified and coordinated operational structure.
- Use tactics in Geographic Response Plans (GRP) to respond to an oil spill.
- Safely deploy oil spill containment boom.
- Communicate between agencies with VHF radios.
- Test and validate the MassDEP GRPs.



Schedule of Events









Classroom

- 1 Intro
- 2 Oil Spill Notification
- 3 Oil Spill Observation
- 4 Boom
- 5 Tactics
- 6 GRPs
- 7 Small/Land Spills
- 8 Ops Brief

Review ICS 201 Identify IC, SO, TF Identify Evaluators Distribute EEG

Trailer Familiarization

- Boom
- Sorbent
- Anchors
- Culvert Plugs
- Ancillary Equip
- Hands-on
 - Boom Connection
 - Anchor Set-up
 - Knot Tying

Field Exercise

- ICS 201 Brief
- Boom staging
- Anchor set-up
- Deploy boom/ strategy
- Deploy Surrogate
- Demobilize

Hot Wash

- ID
- Strengths
- Areas for
- Improvement
- **GRP** Modifications
- Participant Feedback
- Collect EEGs
- Certificates
- Adjourn



Program Background





Trailer Re-supply & Maintenance

Reporting (888-304-1133)

- Date and Time of release
- Location
- Brief description of incident
- Name, address and contact number of RP
- Amount and type of equipment used
- On-Line reporting form
 - http://grp.nukaresearch.com/faq.html
- Re-supply and Maintenance
 - Annual inspections of trailers
 - Re-supply after an event
- Contact
 - Julie Hutcheson, 617-556-1191
 - julie.hutcheson@state.ma.us





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Module 2 – Oil Spill Notification

North Shore GRP Exercise Marblehead, MA

May 25th, 2016





Notification Procedures

- MassDEP
 - 1-888-304-1133
 - MEMA routes call to DEP office or afterhours responder
- Land Spill
 - 10 gal petroleum
 - Oil to surface water creating sheen



- Oil/Hazardous Material Leaks/Releases/Spills
 Examples: 10 Gal. Petroleum or 25 Gal. Transformer Oil to Ground, Petroleum to Surface Water Causing Sheen
- Drinking Water Emergencies Examples: Contamination, Distribution/Plant Failures, Source Loss
- Wastewater Emergencies
 Examples: Bypasses, Failures, Overflows, Power Outages
- Other Environmental Emergencies
 Examples: Threats from Air Pollution, Industrial Wastewater, Large Quantities of Hazardous Waste



Notification Procedures

USCG

NRC 1-800-424-8802
Local Sector/Station
D1 Command Center

Any oil spill, chemical release, or maritime security incident





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Module 3 – Oil Spill Observation

North Shore GRP Exercise Marblehead, MA

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Objectives

Familiarize First Responders with:

- Observing/Characterizing spilled oil

 Accurately Reporting Spill Details to better inform clean-up and recovery efforts



Observation

- Goal
 - Characterize the Oil
 - Describe what you see in standard terms
- Observe and Report:
 - On-scene weather
 - Sea State Conditions
 - Location of Spill
 - Color and Structure/Distribution of Spill

Source: NOAA Open Water Oil Identification Job Aid



Checklist

- Spill Location(s)
- Spill Dimension(s)
- Orientation of spill(s)
- Distribution of oil
- Color and Appearance (silver/gray, rainbow, metallic, transitional, dark, mousse)
- Estimate of area with oil
- Is oil recoverable? (black and transitional oil, mousse, heavy metallic slicks from diesel or oil)
- Source



NOAA

Oil Color/Appearance

- Sheen (silver/ gray)
- Rainbow
- Metallic
- Transitional Dark
- Dark (or true)
 Color
- Emulsified



Sheen, Rainbow, Metallic





Diesel





Fuel Oil, Heavy Oil





Emulsion, Mousse





Quantification

- Computing Volume

 Area x Thickness
- Estimating Surface Area
 i.e. 100 yds x 10 yds...
- Estimating Thickness
 Color



 Quantification not as important as reporting detailed description of appearance and coverage



Review

- Oil Spill Notification
 In the event of an oil spill in the marine environment, who are you going to call? Mass DEP and the USCG
- Oil Color/Appearance
 This is an example of what type of
 sheening?
 Rainbow
- Checklist

Useful information when reporting an oil spill incudes: location, dimension, distribution of oil, color and appearance, estimate of area, is oil recoverable? source?

Quantification

I should wait until I know exactly how much oil has been spilled before reporting it. False



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Module 4 - Boom

North Shore GRP Exercise Marblehead, MA

May 25th, 2016





Objectives

- Familiarize First Responders with:
 - Boom nomenclature/components
 - Common Boom Failures
 - Factors influencing use/strategy
 - Anchoring and Anchoring Systems
 - Towing Boom

Boom Deployment Safety and Safe practices



Boom

 Boom is a containment barrier used to intercept, control, contain, and concentrate spreading oil on water



Understand the goal prior to deploying



Boom Components





Bridle Components

Bridle End • Plate Bridle End (Universal Plate Ślide Float Shackle Connector) Bridle Pin- Bridle Pin Carabiner Float **Bridle Components** Shackle



Boom/Bridle Configuration





Common Boom Failures





Structural Failure





Entrainment Failure - Video





Boom Angle



Current speed is key limiting factor!



Factors Influencing Use & Strategy

Physical/Environmental Conditions

- Currents
- Waves
- Tides
- Wind
- Water Depth
- Debris
- Ice
- Weather Forecast







Boom Towing w/ Trip-Line



If trip lines are incorporated into anchor set-up, this method should be followed for both bow and stern towing



Anchoring

- Anchor line
 3-5 times
 water depth
- Anchor Buoy Never attach directly to end connector
- Must consider
 - Bottom type
 - Current Speed





Boom Towing & Anchoring





Shoreline Anchoring

- Rebar (in trailer)
- Anchors (in trailer)
- Piers
- Pilings
- Trees
- Rocks


Shoreline Anchoring - Rebar





Shoreline Anchoring - Anchor





Review

- Boom and Bridle structure/components
 The portion of the boom below the water surface is referred to as the Skirt .
- Boom Failures
 - **Entrainment** failure occurs when current speed exceeds .75 kts and boom is placed perpendicular to current flow.
- Factors influencing strategic use Name one physical/environmental factor that can influence boom deployment strategy.
 Current, Waves, Tides, Wind, Water Depth, Debris, Ice
- Boom Anchoring Anchor line should be **3-5** times water depth
- Boom Towing When towing boom, always use a Towing bridle





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Module 5 - Tactics

North Shore GRP Exercise Marblehead, MA

May 25th, 2016





Objectives

- Learn basics of protective booming tactics
- Selection Factors
 - Boom Selection Based on Operating Environment
 - First Responders 12" or 18"?
 - Boom Tactics



GRP Booming Tactics

• Three most common tactics:

- Exclusion
- Diversion
- Deflection
- Containment
- Free Oil and Shoreside Recovery tactics – Local First Responders not expected to implement
- Oil Recovery using available sorbent material will be discussed









GRP Tactics

- BB Beach Berm
- Culvert Block
- Diversion Booming
- PR Passive Recovery
- DF Deflection Booming
 - Exclusion Booming
 - Shoreside Recovery
- Free-oil Recovery
- 🔞 🚾 Tide Gate
 - Boat Ramp

Other symbols used in Mass GRPs

- Beach Berm Material
- Protected-water Boom (Flood Tide)
- Protected-water Boom (Ebb Tide)
- Snare or Sorbent Boom
- Booming Strategy Developed by Other Agency

Seasonal Booming Tactic Lock Outfall Mosquito Ditch U.S. Coast Guard Station Boston Harbor Co-op **Response Trailers** Boston Harbor Co-op I-Beams Pump Station Hurricane Barrier HB Water Intake Permanent Attachment \bigcirc Access Point (S) Staging Area Response Trailer Washover Area Lighthouse





MASSACHUSETTS Geographic Response Plan Tactics Guide







VERSION: APRIL 2012

 Standard reference for GRP deployment methods

- Standardized terminology
- Defined resource sets
- Facilitates GRP deployment
- Training tool

http://grp.nukaresearch.com/CIGRP



| | Operating Environment | Significant Wave Height | Examples of General Conditions | |
|-------------|---|---------------------------------|--|---|
| | Open Water | ≤ 6 ft. | Moderate waves, frequent white caps | |
| | Protected Water | ≤ 3 ft. | Small waves, some white caps | - |
| Environment | OTING Calm Water ≤ 1 ft. Small, short no | Small, short non-breaking waves | | |
| | Fast Water | ≤ 1 ft. | Small, short non-breaking waves with currents exceeding 0.8 knots, including rivers | |

| | Boom Property | Calm Wa | ater | Calm Water-current (fast water) | Prote Wat | cted ter | Open Water |
|---|---|--------------------|------------|------------------------------------|----------------|-------------|------------------------|
| | Height (in) | 6 to 24 | | 8 to 24 | 18 to 42 | | 36 to 90+ |
| | Minimum reserve buoyancy to weight ratio | 2.1 | | 3:1 | 3 | | 7:1 |
| 12" boom suitable for Calm | Minimum total tensile strength (lbs) | 1,500 | þ | 5,000 | 5,0 | 00 | 10,000 |
| 18" boom suitable for Calm and Protected water | Minimum skirt fabric tensile strength (lbs/ in) 2TM=2 tension members; 1TM=1 tension member | 2TM - 3 1TM - 3 | 800 800 | 2TM - 300 1TM - 300 | 2TM - 1TM - | 300 400 | 2TM - 400 1TM - 400 |
| | Minimum skirt tear strength (lbs) | 100 | | 100 | 10 | 0 | 100 |

Consider operating environment when applying tactic/ equipment to site



Booming Tactics Applied-Video





Oil Spill Containment

Fixed-boom tactic to corral spilled oil on the water.



Considerations:

- Wind
- Current
- Tidal conditions
- Anticipated volume of spilled oil

Improper anchoring will not provide adequate containment and may allow oil to escape.





Oil Spill Containment

Place boom using secure anchor systems or mooring points to provide adequate containment area.

Anchoring systems often deployed first; then boom is set from one anchor to the adjacent anchor.

Site conditions will influence deployment configuration options.





Oil Spill Containment

Sunken vessels

- Current and tidal influences.
- Probably won't surface directly above vessel.



Greater depth + stronger current = increased oil displacement



Recovery Tactic - Sorbent





- Sorbent Pads and Boom
 - Absorbent
 - Most effective in lighter oils
- Snare (Pom-Poms)
 - Adsorbent
 - Most effective in viscous oils

Sorbent Material is generally <u>NOT</u> effective on oil sheens!

Oil sheens are typically <u>thinner than</u> <u>a human hair and in most cases</u> cannot be recovered













Achieving Strategic Purpose







Minimize "bellies" and pockets

Proper boom angle

Anchoring - will it hold?

Anticipate tide and weather changes Adjust and modify as necessary

Transfer of Responsibility

First Responder (First 4-6 hours) Response Contractor



Review

 Operational Environment – Boom Selection
 The 12" and 18" boom in MassDEP trailers are suitable for calm and protected waters.

• Common Tactics & Implementation Three most common booming tactics used in MassGRP implementation are exclusion, diversion and deflection.

• Containment Booming Effective containment can be achieved by proper employment of anchoring systems.

Oil Recovery – Sorbent
 Sorbent pads are most effective when used in heavy, viscous oil. True or False?

False. Sorbent Pads are effective on lighter oils



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Module 6 – Geographic **Response Plans**

North Shore GRP Exercise Marblehead, MA



May 25th, 2016



Objectives

- Familiarization with MassDEP Geographic Response Plans (GRP)
 - Basic information
 - Format
 - Content
 - How to use



MASSACHUSETTS Geographic Response Plan







North Shore GRPs

- 32 GRPs for the North
 Shore Region
- Incorporated into the Plymouth to Salisbury, MA Area Contingency Plan (ACP)



North Shore, Mass. **GRP** – Sites NS-01 Upper Merrimack River NS-02 Newburyport NS-03 Merrimack River Entrance NS-04 Plum Island River NS-05 Parker River NS-06 Egypt River NS-07 Rowley River NS-08 Eagle Hill River NS-09 Inswich River NS-10 Plum Island Sound Entrance NS-11 Essex River NS-12 Essex Bay NS-13 North Annisquam River NS-14 Rockport Harbor NS-15 Long Beach NS-16 Good Harbor Beach NS-17 South Annisquam River NS-18 Gloucester Inner Harbor NS-19 Gloucester Outer Harbor NS-20 Black Beach NS-21 Manchester Harbor NS-22 Beverly Shoreline NS-23 Danvers River NS-24 Beverly Harbor & Salem NS-25 Salem Harbor NS-26 South Salem Harbor NS-27 Marblehead Harbor NS-28 Swamnscott Shoreling NS-29 Lynn Harbor NS-30 Saugus River NS-31 Pines River NS-32 Nahant

version: November 19, 20





Cape and Islands Geographic Response Plan Barnstable CI-03



GRP 101: The Basics

Response Tool

- Pre-planned
- Quick Decisions
- Initial Actions

Version: September 2009

Page 1 of 4

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GRP

Program

GRP Process





GRP Basics

A GRP is...



A map-based response tool to protect sensitive areas from oil spills

A GRP is NOT...

 \bigcirc

Not a mandate for protection or response

- A consensus plan developed in a non-emergency setting



- A tactical plan for use by first responders and...
- Unified Command Staff
- Spill Response Contractors and Oil Spill Removal Organizations

Not a performance standard

Not the only sites that will or should be protected

Not a substitute for best professional judgment

Not final until field verified



GRP Basics

ick on the links below to downloaded the individual GRPs for the Cape and Isla



GRP updated based on results of field testing.

Cape and Islands GRP Site Selection Information

For the purpose of selecting and surveying GRP sites, the Cape & latands GRP (CIGRP) Zone was divided into four Jaob-zones: Warth's Vingers, Hanculate, Upper Cape and Middle Cape , Lower Cape, and Oxfer Cape. A total of 29 sites were selected from writhin these born sub-zones for CIMP development, based on priorities expressed by load, sites, and federal agencies, local communities, states and care public of the public.



MassDEP GRP Website http://grp.nukaresearch.com/2-uncategorised/54-capecod-and-islands-geographic-response-plan-grpproject.html



http://www.mass.gov/eea/agencies/massdep/cleanup/ marine/massachusetts-geographic-response-plan.html

MassDEP GRP Online Viewer







GRP Layout

Standard format throughout 6 geographic regions in coastal Massachusetts.

Page 1 – Tactics Map Cape and Islands Geographic Response Plan Barnstable CI-03







Pages 2 & 3 – Tactics Tables

| ID | Location and Description | Response Strategy | Implementation | Response Resources | Staging Area Site Access | Resources Protected | Special Considerations |
|----------------|---|--|---|---|--|---|---|
| CI-03-01 DV | Barnstable Harbor Lat. 41°42'28.6"N Lon. 70°17'58.2"W | Divert and Collect - Shoreside During a flooding tide with oil entering the harbor, place the boom in a chevron pattern and divert oil to shoreside collection locations on the boat ramp and onshore across the channel. | Deploy anchors and boom with skiffs. Place 400ft of 16 to 18" boom in chevron aray at the proper angle to divert incoming oil to the collection sites. Set up shoreside recovery and tend throughout the tide. | Deployment Equipment 400 ft. 16 to 18" boom 3 anchor systems 2 anchor stakes 2 anchor stakes 2 shoreside recovery system Vessels 2 skiffs Personnel/Shift 8 total (1 vessel operator + 1 responder per vessel, 2 responders for each shoreside recovery site) Tending Vessels 2 skiff Personnel/Shift 6 total (1 vessel operator + 1 | Barnstable Harbor Boat Ramp. (Rte 6, left on Millway to the Boat Ramp) Road access is available on each shore. Boat ramps may not be useable at low tide. Chart 13251-1 | Fish-shellfish, finfish Birds-waterfowl concentration Marine mammals- seals Habitat- marsh, sheltered tidal flats Human Use- Commercial boat harbor, 50+ aquaculture grants, high-use recreational area Land mgt: ACEC | Vessel master should have local knowledge. Entire site surveyed: 10/09/07. Tested: not yet |
| | CI-03-03 Barnstable Harbor Various Locations PR Barnstable Harbor Nearshore waters in the general area of: Lat. 41'43'41.3"N Lon. 70"16'19.1"W | Pasive Recovery Place passive recovery factics to recover oil and provent if from entering sensitive areas. Deploy at locations that are fixely to be impacted and adequately secured. Free-oil Recovery Maximize free-oil recovery environment of Scorton Creek depending on spill location and trajectory. | 125 250 500 Feet | | Same as CI-03-01 Same as CI-03-01 Same as CI-03-01 Same as CI-03-01 | Same as CI-03-01 Use snare by persistent of boom for no oils. Same as CI-03-01 Vessel mast local knowly Use extreme waters with rocks & con sand bars. C winds are lo and can crea operating en operating en | om for Is and sorbent n-persistent rshould have rdge. : caution, shoal numerous reefs, timaally shifting urrents and cally variable te dangerous wironments. |
| | Version: September 2009 Page 2 of 4 | Nuka Research and | | PR | Nuka Rese | arch and Planning Group, LLC | |







Cape and Islands Geographic Response Plan

Site Photographs and Contact Information



Inner boat harbor looking east.



Barnstable boat basin and bridge looking east.

Version: September 2009 Page 4 of 4

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Contact Information: Barnstable Harbormaster: (508) 790-6272 Barnstable-Fire: (508) 362-3312 Yarmouth-Fire: (508) 398-2211 Yarmouth-DNR: (508) 760-4800 Yarmouth-Oil Spill Coordinator: (508) 760-4800 USFWS: (413) 539-3194

Page 4 – Site Photos & Local Contacts



Review

 Purpose of GRP GRP tactics and strategies are intended to be implemented prior to oil spill impacts to protect sensitive resources. True or False?

GRP tactics and strategies must be implemented as written and in accordance with MassDEP and U.S. Coast Guard requirements. True or False?

False

GRP Content & Structure
 GRP provide recommended response resources that will be
 needed to implement listed booming strategies. True or False?
 True

• Role of GRP in Spill Response GRP are intended for use by local first responders, Spill Response Contractors and Unified Command Staff.



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Module 7 – Small/Land-**Based Spills**

North Shore GRP Exercise Marblehead, MA



May 25th, 2016



Land-Based & Gasoline Spill Response

- Land-based spills and GRP implementation
- Fixed Facility Spills
- Mobile Facilities/Fueling
- Tank Truck Rollovers



Gasoline Spills

- Considerations
- Precautions







Culvert Blocking

Culvert Plugs

- 3 sizes in trailer
- Containment Boom
 - At culverts or outfalls
 - Supplement culvert plugs











Vessel Spill Prevention

- Vessels
 - Containment Boom
 - Prevent spread of spilled oil
 - Allow for oil recovery
 - Removing fuel cans, oil, paints, etc.
 - Vent plugging to prevent spill (in event of sinking)
 - Only if safe to do so!





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Module 8 – Exercise Brief

North Shore GRP Exercise Marblehead, MA

May 25th, 2016





Objectives

- Learn basics of protective booming tactics
- Practice handling equipment
- Deploy Boom
 - Towing
 - Connecting
 - Anchoring
- Coordinate among multiple agencies/vessels
- Use CH-17 (VHF) to coordinate operations
- Demobilize boom
- Hot wash/identify additional preparedness needs
 - After Action Report



Safety First!

Safety

- Review ICS 208 Safety Message/Plan
- This is NOT a RACE!
 - Methodical, deliberate approach
- PFDs
- Lines Under Tension
- Pinch Points
- Safe Lifting
- Vessel Loading/Balance
- Hydration, Sunscreen

SAFETY MESSAGE/PLAN (ICS 208)

| 2016 Marblehead Harbor GRP Exercise Period: Time From: 0900 Time | To: 1500 |
|--|----------|

3. Safety Message/Expanded Safety Message, Safety Plan, Site Safety Plan:

KNOWN SAFETY HAZARDS

- Lines under tension (boom towing and shoreside anchoring)
- Pinch points (connecting boom, boom towing, vessel operations)
- Heavy lifting (boom and anchors) Observe safe lifting practices.
- Entanglement Personnel, lines/rigging, and boom. Personnel, lines, propellers. Maintain situational awareness
 when working around lines, anchors and boom during shoreside and on-water deployment operations to ensure
 that entanglement does not occur. Do not stand in the bight of lines or where boom is faked out for deployment.
- Loose clothing and jewelry Refrain from wearing loose clothing that may snag or become entangled on
 equipment. Jewelry including necklaces and rings should be removed while engaged in equipment deployment
 operations.
- Slips, trips, and falls Exercise caution in wet, muddy, and rocky areas and when working on piers or bulkheads
 near water to avoid falling. During boom deployment and retrieval when working in, on, or near the equipment
 trailers and ramps, special precaution must be taken to avoid injury when working on trailer ramp and around trailer
 ramp cables. Caution tape provided in trailer should be attached to trailer ramp cables to mark their location.
- Crushing injuries Use caution when working with anchors, driving shoreside stakes with sledgehammer, and when working alongside other vessels to avoid crushing injuries.
- Vessel Operations Working in close proximity to other vessels; Boom deployment and towing, and rigging near
 outboard motors and vessel screws/propellers.
- Flotsam and debris Conduct shoreside walkdown (Exercise Safety Officer) to identify and remove dangerous
 objects including glass, sharp objects, or debris washed up on shore that may endanger participants and/or impede
 exercise activities. Medical waste should only be retrieved by on-scene medical personnel. Flotsam should only
 be removed if it can be done safely and only if it impedes exercise activities.
- Hypothermia Dependent on water temperature. If participant is immersed in water, extricate safely and quickly and treat as appropriate.
- Heat Stress/Stroke Dependent upon air temperature and humidity. Exposure to extreme heat may put
 participants at risk for heat stress. Heat stress can result in heat stroke, heat exhaustion, heat cramps, or heat
 rashes. Participants exhibiting heat stress related symptoms must be treated immediately IAW participating agency
 protocols.

SPECIFIC PRECAUTIONS

- An Exercise Safety Officer will be identified and be responsible for participant safety.
- FIRST AID equipment is available. Atlantic Ambulance will be available on-scene
- Personal Flotation Devices (PFDs) are required for all vessel personnel and all shoreside personnel working along shoreline, bulkheads or piers.
- Steel-toe boots and safety glasses should be worn.
- Hearing protection should be worn when working around generator and air compressor.
- All vessel operators will conduct a safety brief with passengers to review vessel-specific safety precautions.
 During vessel operations, a spotter should be assigned to provide guidance to vessel operator. Utilize fenders when mooring alongside pier/dock and when rafting with other vessels.
- Man overboard Assigned vessel spotter must maintain constant visual contact with man overboard and provide position and direction to vessel operator. "Emergency" phrase must be communicated to all exercise participants. Incident Commander or Exercise Coordinator will halt all exercise activity.
- Vessel load balancing Each vessel operator must ensure that personnel and equipment are stationed and distributed appropriately on deck.
- Hydration Participants must ensure they remain properly hydrated based on their level of exertion and on-scene weather conditions (heat, humidity). Water is provided.
- Sunscreen Participants should ensure proper sunscreen application based on weather conditions. Sunscreen is provided.

4. Site Safety Plan Required? Yes No

| Approved Site | | | | |
|-----------------|-------------------|---------------------------------|------------|--|
| 5. Prepared by: | Name: M. Popovich | Position/Title: Exercise Coord. | Signature: | |
| ICS 208 | IAP Page | Date/Time: 5/19/2016 12:00 AM | - | |


Organization





Questions?

Massachusetts GRP Home Page grp.nukaresearch.com/

MassDEP Oil Spill Training & Equipment Resources mass.gov/eea/agencies/massdep/cleanup/ marine/oil-spill-training-and-equipmentresources.html