2008 PREP Exercise
Mt. Hope Bay Boom Deployment Exercise
Summary of Training and Evaluation

Background

As part of the 2008 PREP Exercise in Mt. Hope Bay, three facilities (Seaboats, Dominion, and Somerset Power) planned to deploy boom to simulate protection of environmentally sensitive areas near their facilities. Boom deployment configurations and/or Geographic Response Plans (GRPs) were developed independently by each of the facilities as part of their Facility Response Plans. Evaluators from state and federal agencies were assigned to observe this boom deployment and use a standard Evaluation Form (Attachment A) to document whether the exercise objectives were met.

The purpose of this exercise was to *test the booming strategies, NOT to test the responders*. It was not intended to test or measure the response capability of any of the participating facilities or OSROs. The evaluation criteria focused on the exercise objectives as described below.

The information gathered through these evaluation forms was compiled by Nuka Research and Planning Group, LLC (Nuka Research) for the Massachusetts Department of Environmental Protection (MassDEP) to be used as part of ongoing programs to develop and test GRPs for environmentally sensitive coastal areas throughout Massachusetss.

Boom Deployment Exercise Objectives

For the purpose of this evaluation, the following objectives were measured:

1. Establish & follow safety plan.
2. Deploy booming strategies *as written* at each location, using the resource set (boom, anchors, vessels, personnel) identified in the booming strategy or GRP.
3. If booming strategy deployment requires modification, identify potential modifications or alternate deployment configurations and document modifications to strategy (i.e. more or less boom used, changes to anchor configurations, differences in numbers of personnel required to deploy).
4. Document exercise using written records, photographs, video tape, and/or other means. Documentation should include: environmental conditions on-scene (tide, wind, sea state, visibility, currents, precipitation, etc.); length of time required for deployment (under environmental conditions); observations on deployment configurations; list of participants.
5. Conduct post-deployment “hot wash” to review objectives and identify major take-away lessons.

Additional Considerations for Evaluation Team

6. Evaluate whether booming strategies can be effectively deployed *as written* using the prescribed resource set.
7. Evaluate whether the booming strategies as written were appropriate for deployment by first responders.
8. Make recommendations regarding possible improvements to booming strategies (i.e. equipment functionality, deployment techniques, anchoring techniques, etc.)
9. Identify areas where additional deployment tests would be useful for developing rules-of-thumb about boom deployment and/or GRPs.
10. Identify opportunities to improve future deployment tests.

Safety

Safety is always the highest priority. A safety briefing was presented by the Exercise Participants prior to the deployment.

Pre-Deployment Evaluator Training

Prior to the boom deployment, evaluators from the U.S. Coast Guard, MassDEP, and some of the participating facilities took part in a brief training session regarding the objective of the boom deployment evaluation. A copy of the training presentation is included in Attachment B.

Summary of Deployment Test – Dominion Energy

Due to extreme weather, the Dominion Energy boom deployment was the only one to take place as planned. Seaboats had an abbreviated boom deployment, but it was not evaluated by any of the evaluation team. The GRP developed by Dominion for testing during PREP is included as Attachment C. The tactic that was tested was EX-01, an exclusion boom array intended to close off the area in which Dominion's water intake is located. Protecting this water intake would be a top priority in the event of a spill in Mt. Hope Bay, because the water is used for cooling at the power plant. If the water intake were compromised, the plant could not continue to operate.

The testing began with a safety briefing provided by the Dominion spill responders (all employees of the plant). They then reviewed the operational plan, before moving to the deployment site to begin the deployment.

Boom was deployed from a shore-based reel located on the Dominion dock, and was fed out to a small skiff on the water, which then towed the boom across the opening to an anchor point at the other side. An existing signpost on the beach was used to tie off the distant end of the boom. The end closest to the facility was tied off on a piling on the dock. The GRP called for 500' of boom, but a total of 600' was deployed during the exercise. Otherwise, the GRP was deployed almost exactly as written. It was clear that the responders participating in the exercise had strong familiarity with deploying boom at this location. They completed the deployment very

efficiently, despite the conditions on-scene (high winds, front coming through the area).

Summary of Evaluator Comments – Dominion Energy

Evaluator comments on the Dominion Energy deployment were provided by MassDEP responders and Nuka Research staff. A debrief was held after the exercise, during which the evaluators discussed the exercise with the Dominion Environmental and Safety staff. The table below contains the actual input from the evaluation forms collected during the exercise.

Objective	Was it Met?	Comments
1. Safety		
a. Safety briefing conducted.	YES	Explained PPE, gloves, boat safety, positions. Good briefing.
b. Safety procedures followed and enforced by participants & observers/evaluators.	YES	There was one incident where a responder on the dock was in a potentially dangerous position and this was immediately pointed out & corrected.
2. Booming Strategies		
a. Written copies of booming strategies distributed to participants, evaluators & observers.	YES	
b. Booming strategies deployed *as written* (length of boom, angle, anchor configurations).	NO	GRP called for 500' of boom but 600' was actually deployed. However, this change was identified by Dominion ahead of time and discussed, so it was a planned deviation.
c. Booming strategies deployed using resource sets (vessels, response personnel) specified in written plan.	NO	600' of boom used rather than 500' – otherwise everything followed the plan. Boats and reel used as planned. EX-02 (marsh) not tested.
3. Booming Strategy Modifications		
a. Modifications to booming strategies tested.	NO	Modifications were discussed but not tested due to safety considerations with degrading weather conditions (winds gusting to about 25mph).

Objective	Was it Met?	Comments
b. Modifications to booming strategies documented by exercise participants and/or facilitators.	YES	Participants and evaluators discussed the potential benefit of changing booming configuration from straight leg to chevron, and agreed that this might give the boom more hold, because of the additional anchor point.
c. Modifications discussed during exercise debriefing.	YES	See above.
4. Exercise Documentation (by Participants/Facilitators) Note: This topic deals with the documentation kept by the Exercise Participants and Facilitators, and does not include the Evaluation documentation.		
a. Written documentation recorded by exercise participants and/or facilitators.	Y / N	This section was not completed, as it is intended for use in GRP exercises that are designed & conducted by MassDEP, not by a third party.
b. Photographs and/or videotape taken.	Y / N	
c. On-scene conditions documented.	Y / N	
d. Deployment configuration documented (including modifications).	Y / N	
e. Names of participants documented.	Y / N	
f. Start/stop times and length of deployment documented.	Y / N	
5. Debrief and After Action		
a. Debrief or "hot wash" held immediately following deployment exercise.	YES	
b. Debrief included major lessons learned, and take-away action items (i.e. changes to deployment strategies, need for additional planning or testing, etc.)	YES	
c. After action report to be developed.	YES	Documented in this report and other PREP documentation.

Open-Ended Evaluation Questions
Were booming strategies effectively deployed *as written?* Boom was deployed as shown on GRP but 2 bows in the boom that could have led to entrainment. It took more of a horseshoe shape than a straight leg. It was agreed that adding an apex anchor and changing the configuration to a chevron would make it easier to maintain the boom angle. This was noted to be especially important since there can be a strong current near the water intake, due to the large volume of water flowing into the pipe. A chevron would keep the boom further out from the intake, in a lower current area. Additional anchors or modifications may be needed during heavy wather.
If no, were modifications made? Were modified strategies effectively deployed? Modifications were discussed but not tested due to safety considerations as the weather deteriorated.
Based on your experience, can you suggest additional modifications to the strategies or their implementation that might make them more effective? Consider setting a permanent mooring buoy at the apex location. Also consider setting a permanent anchor on the beach side, since the integrity of the signpost used for the exercise was unknown (i.e. how deep was it anchored, was it in a cement footing, etc.). Evaluate strength/force of current around intake and establish safety practices to keep boom from getting caught in current/sucked into intake. Experiment with different anchoring conventions to keep boom in place for multiple operational periods.
In your professional opinion, were the booming strategies, as written, appropriate for the first responders who deployed them? If not, how might the strategies be revised to be more manageable by a first responder (as opposed to a professional spill responder)? Not applicable since the deployment team were trained spill responders. Noted that team performed their assignments very competently.
Based on your observations today, if you were to design future deployment tests, what would your testing objectives be? Test chevron configuration. Consider doubling up boom. Test under range of circumstances (wind, tide, sea state) Work through the process/implications of having to shut down intake in the event that oil enters it or boom is sucked into intake. Determine how intake would be effected if boom sucked in (would it be taken care of by grate, etc.?)
Do you have any suggestions for improving future deployment tests (in any respect)? No comments received.
Please share additional comments or suggestions regarding today's deployment test and the design/conduct of future exercises. No comments received.

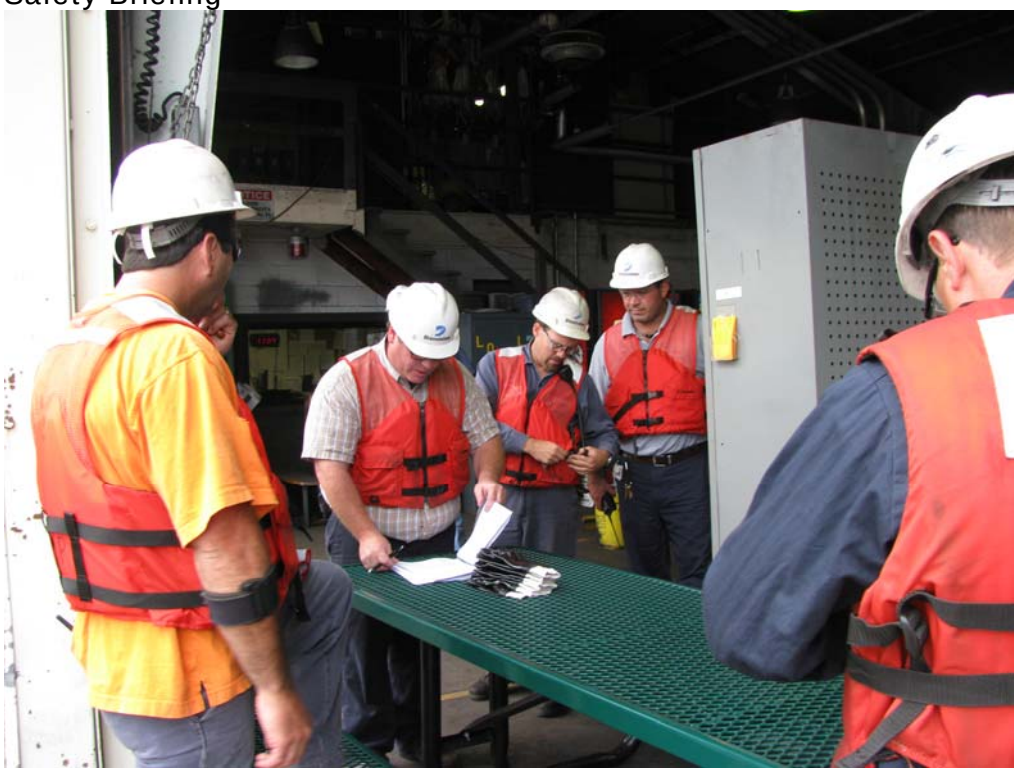
After-Action Items for Dominion Energy

The evaluator team, in consultation with the Dominion Energy staff, identified several after-action items for consideration by Dominion as they continue to refine the GRP for their facility:

- Consider an engineering study to determine how oil would impact water intakes, and to identify tolerance for boom getting sucked into intake.
- Consider doubling up chevron (one in front of the other) for additional protection.
- Consider an engineering study to identify whether the water intake (which is at depth) impacts the surface currents, and if so at what distance out from the intake. Booming should seek to keep oil away from the area where it could get sucked in, if this in fact happens.
- Consider using a chevron rather than a straight-across boom leg for additional hold and more efficient boom angles.
- Consider establishing permanent anchor points on the beach and at the apex of the chevron.
- Separate out the 2 EX tactics (intake vs. marsh) to emphasize that the intake is the first priority.

Photographs from Dominion Energy Boom Deployment

Safety Briefing



Deploying Boom from Reel

Towing Boom

Towing Boom

2008 PREP Boom Deployment Evaluation Form

September 9, 2008 12:00pm to 2:30pm

Evaluator Name: _____

Evaluator Organization:_____

Previous Experience with boom deployments, GRPs, field exercises:

_____

_____

_____

Directions for Evaluators: Please fill out the following evaluation to the best of your ability. If you cannot provide information on a given topic, please note it in the comments.

Objective	Was it Met?	Comments
1. Safety		
a. Safety briefing conducted.	Y / N	
b. Safety procedures followed and enforced by participants & observers/evaluators.	Y / N	
2. Booming Strategies		
a. Written copies of booming strategies distributed to participants, evaluators & observers.	Y / N	
b. Booming strategies deployed *as written* (length of boom, angle, anchor configurations).	Y / N	
c. Booming strategies deployed using resource sets (vessels, response personnel) specified in written plan.	Y / N	
3. Booming Strategy Modifications		
a. Modifications to booming strategies tested.	Y / N	
b. Modifications to booming strategies documented by exercise participants and/or facilitators.	Y / N	

Objective	Was it Met?	Comments
c. Modifications discussed during exercise debriefing.	Y / N	
4. Exercise Documentation (by Participants/Facilitators) Note: This topic deals with the documentation kept by the Exercise Participants and Facilitators, and does not include the Evaluation documentation.		
a. Written documentation recorded by exercise participants and/or facilitators.	Y / N	
b. Photographs and/or videotape taken.	Y / N	
c. On-scene conditions documented.	Y / N	
d. Deployment configuration documented (including modifications).	Y / N	
e. Names of participants documented.	Y / N	
f. Start/stop times and length of deployment documented.	Y / N	
5. Debrief and After Action		
a. Debrief or "hot wash" held immediately following deployment exercise.	Y / N	
b. Debrief included major lessons learned, and take-away action items (i.e. changes to deployment strategies, need for additional planning or testing, etc.)	Y / N	
c. After action report to be developed.	Y / N	

Open-Ended Evaluation Questions

- Were booming strategies effectively deployed *as written?*
- If no, were modifications made? Were modified strategies effectively deployed?
- Based on your experience, can you suggest additional modifications to the strategies or their implementation that might make them more effective?
- In your professional opinion, were the booming strategies, as written, appropriate for the first responders who deployed them? If not, how might the strategies be revised to be more manageable by a first responder (as opposed to a professional spill responder)?
- Based on your observations today, if you were to design future deployment tests, what would your testing objectives be?
- Do you have any suggestions for improving future deployment tests (in any respect)?
- Please share additional comments or suggestions regarding today's deployment test and the design/conduct of future exercises.

Designing and Evaluating GRP and Booming Strategy Deployment Tests

2008 PREP Exercise – Taunton River

September 9, 2008

Elise DeCola, Nuka Research and Planning Group

http://grp.nukaresearch.com/

Developing GRPs and booming strategies: MassDEP Process

- Form Work Group (agency, industry, response organizations, stakeholders).
- Select GRP sites.
- Survey sites.
- Develop GRP (apply tactics to site).
- Test/modify GRP.

Why test booming strategies?

- Determine whether strategy can be implemented *as written.*
- Ground truth specific details – length of boom, configuration, anchor points.
- Work through deployment logistics – staging, vessels, personnel, deployment time.
- Identify limits posed by on-scene conditions.

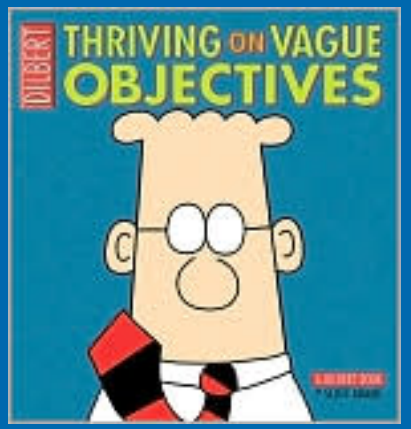
Designing GRP/Booming Tests

- Set measurable objectives.
- Test against objectives.

What is a “Measurable Objective”?

- Use specific and concrete terms to specify the desired performance:
  - Action verb!
- Identify the criteria that will be used to evaluate the performance.
  - Quantitative and descriptive.
- Make sure objectives are feasible and attainable.
  - Limited scope.
- Focus on results.
  - Outputs, not activities.

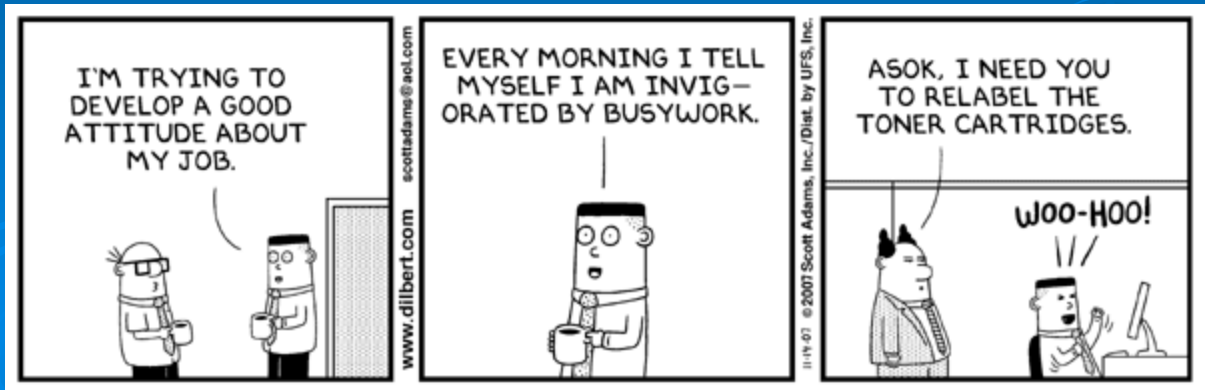
Examples of Measurable Objectives: Specific & Concrete Terms



- **Objective #1a: Test GRP at Site A.**
  - **Measurable?**
  - **How would we measure this?**
  - **What are we measuring?**
- **Objective #1b: Deploy Site A GRP *as written* at each location, using the resource set (boom, anchors, vessels, personnel) identified in the booming strategy or GRP.**
  - **Measurable?**
  - **How would we measure this?**
  - **What are we measuring?**

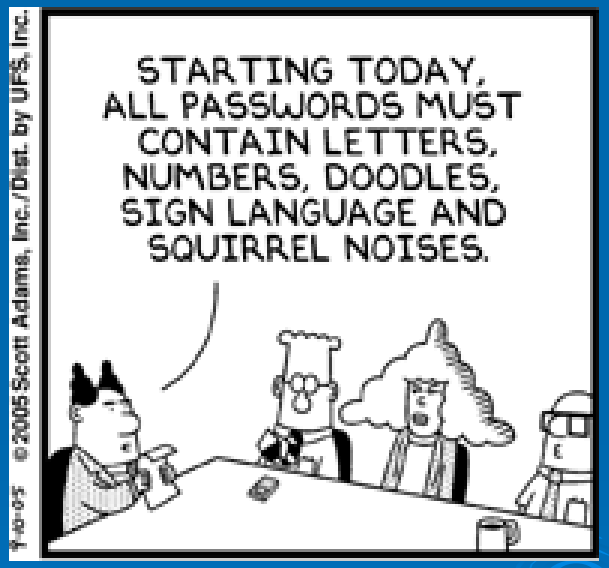
Examples of Measurable Objectives: Specific Evaluation Criteria

- **Objective 2a: Collect information about environmental conditions.**
  - **Measurable?**
  - **How would we measure this?**
  - **What are we measuring?**
- **Objective #2b: Document on-scene conditions, including weather, tide, visibility, sea state.**
  - **Measurable?**
  - **How?**
  - **What?**



Examples of Measurable Objectives: Feasible & Obtainable

- **Objective 3a: Ensure that no safety mishaps occur.**
  - Measurable?
  - How would we measure this?
  - What are we measuring?
- **Objective #3b: Establish and follow safety plan .**
  - Measurable?
  - How would we measure this?
  - What are we measuring?

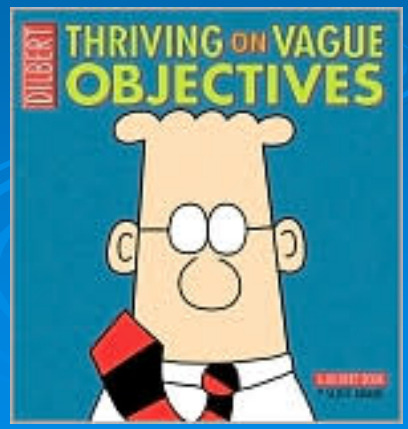


Examples of Measurable Objectives: Results-Oriented

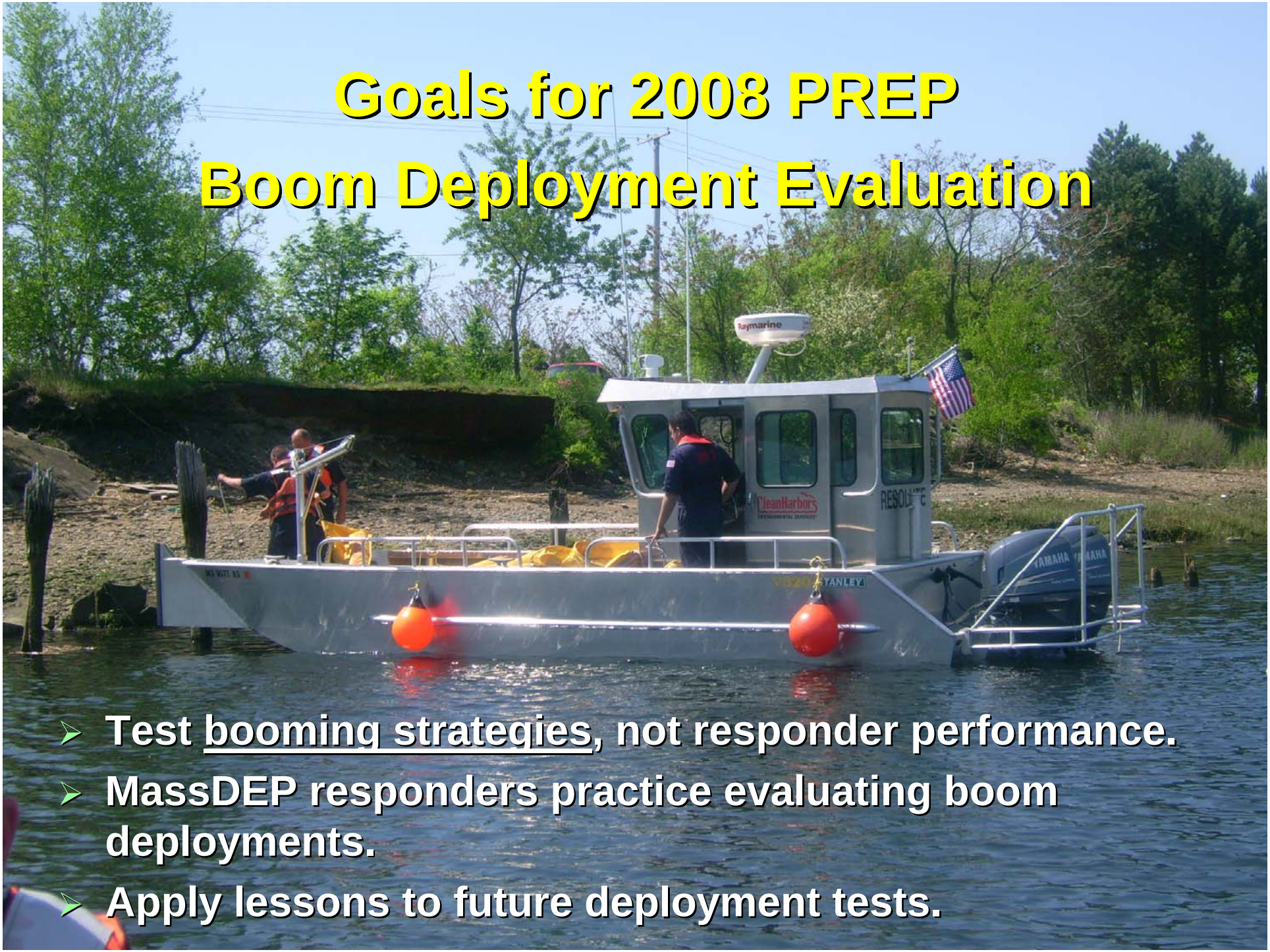
- Objective 4a: Incorporate lessons learned from deployment.
  - Measurable?
  - How would we measure this?
  - What are we measuring?
- Objective #4b: Conduct a hot wash to review objectives and take-away lessons.
  - Measurable?
  - How?
  - What?

Developing Evaluation Criteria

- Specific, observable actions.
- One or more criteria per objective.
- Keep it simple (yes/no, 1 to 5 scale).
- Opportunity for open-ended comments.
- Consider how information will be used.
- Consider databasing or data compilation needs.
- Use consistent terminology and measures.

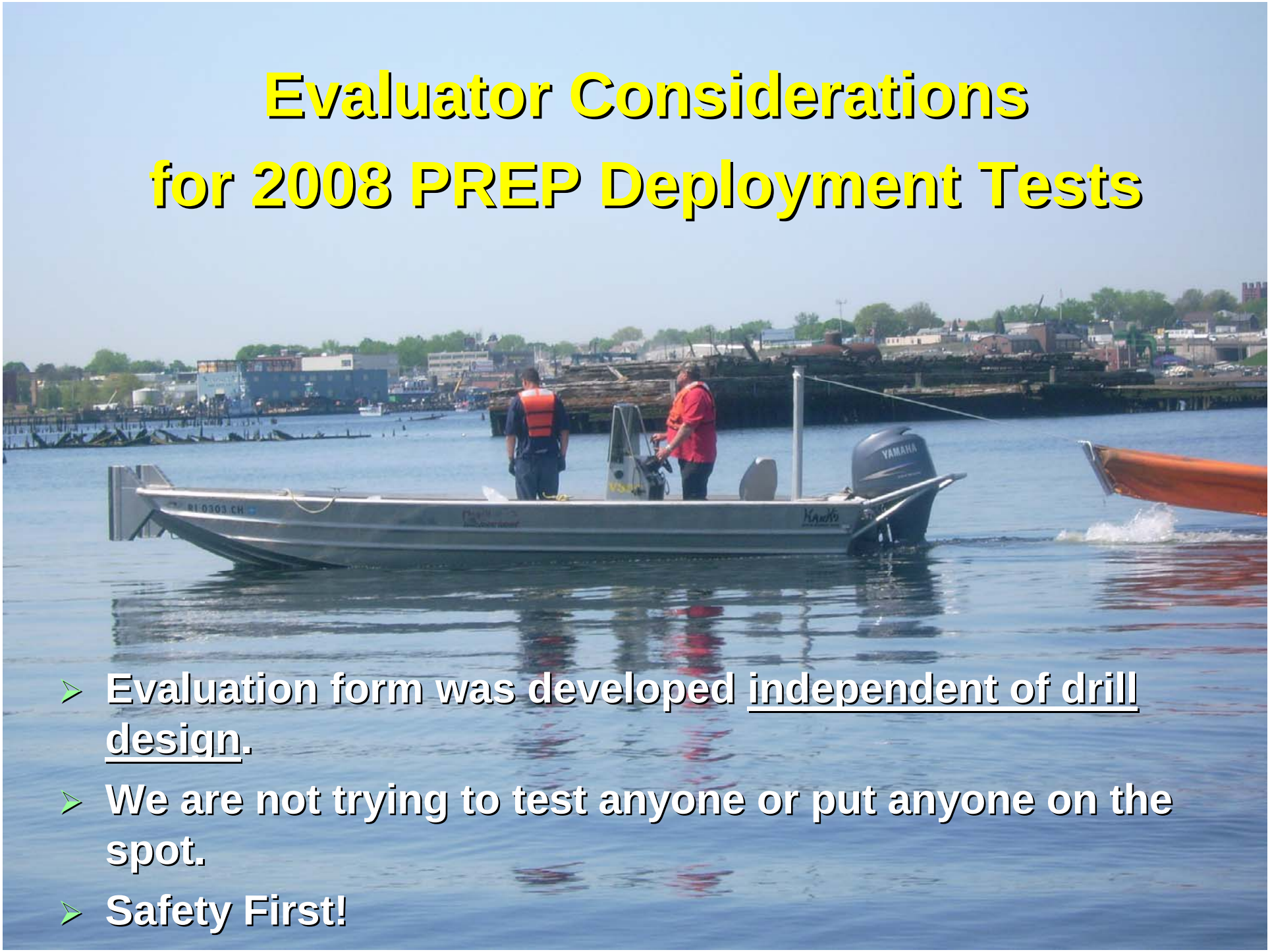


Goals for 2008 PREP Boom Deployment Evaluation



- Test <u>booming strategies</u>, not responder performance.
- MassDEP responders practice evaluating boom deployments.
- Apply lessons to future deployment tests.

Evaluator Considerations for 2008 PREP Deployment Tests



- Evaluation form was developed <u>independent of drill design</u>.
- We are not trying to test anyone or put anyone on the spot.
- Safety First!

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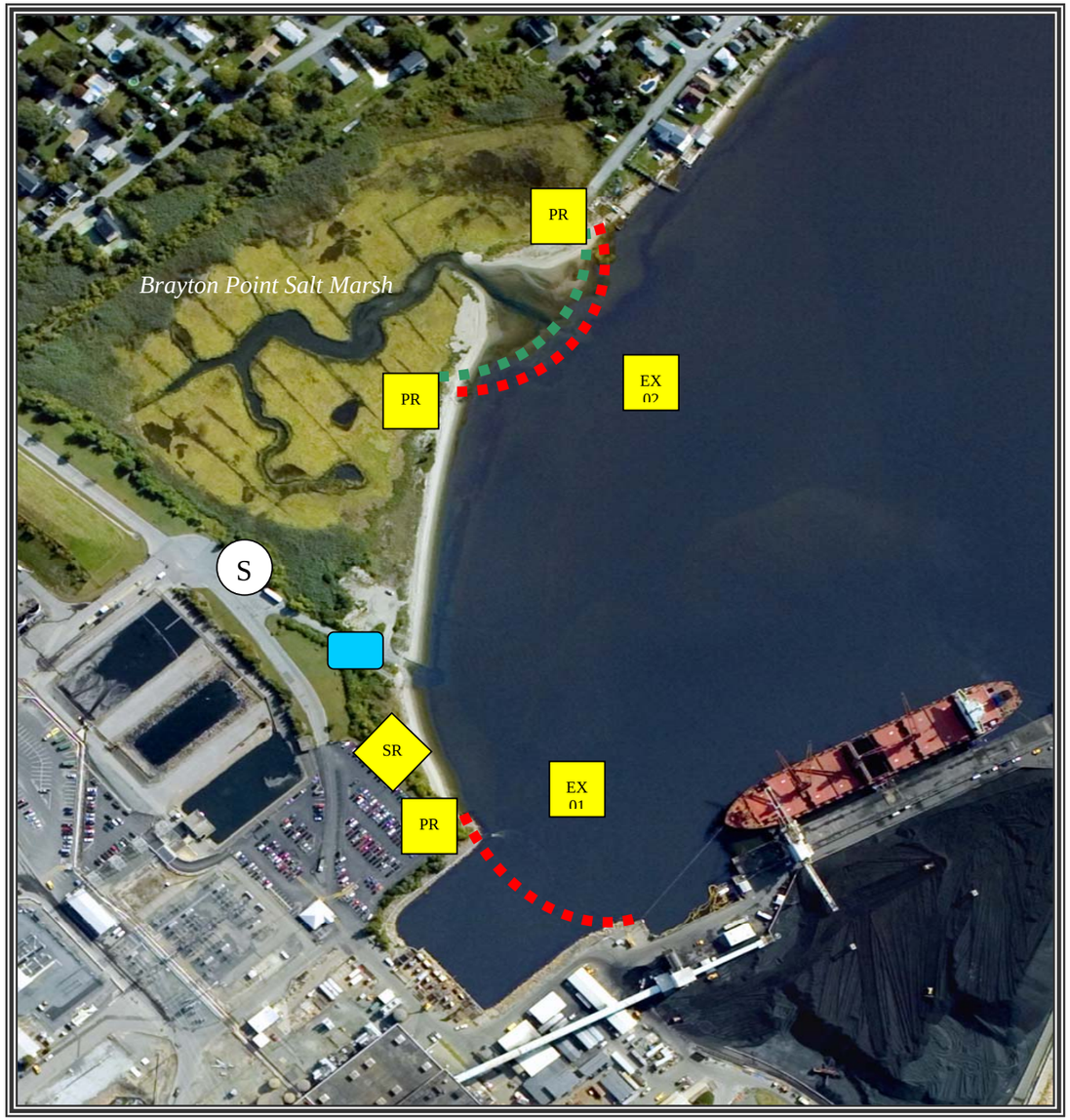
nuka RESEARCH & PLANNING GROUP, LLC.

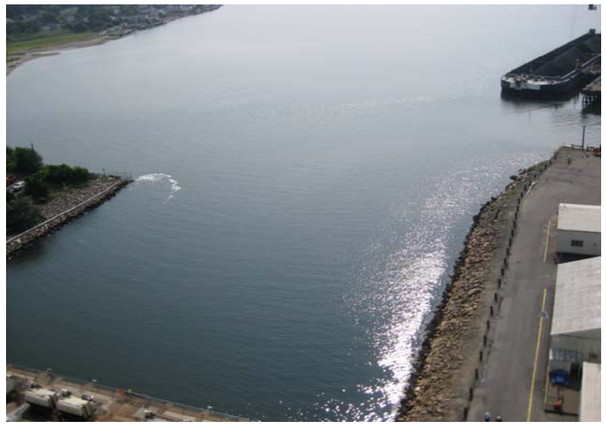
Geographic Response Plan for

Dominion Energy Brayton Point Station, Somerset, MA

ESI Map 55



Brayton Point Station Intake Structure looking east



Brayton Point Salt Marsh looking northeast

Protected-water Boom

Snare or Sorbent Boom

EX — Exclusion Booming

PR — Passive Recovery

SR — Shoreside Recovery

S — Staging Area

Boat Ramp

Local Contact Numbers

Somerset Fire Department
508.646.2810

Dominion Energy Brayton Point - Watch Engineer
508.646.5246

ID	Location & Description	Response Strategy	Implementation	Response Resources	Staging Area Site Access	Resources Protected	Special Considerations
01 EX	**Brayton Point Intake**	**Exclusion** Exclude oil form entering intake Structure	**Deploy boom** - North anchor to beach sign boom above high tide mark - South anchor to pipe along dock to allow for tide changes	**Deployment** ***Equipment*** 500 ft 21" boom ? Anchor Sytems ? Anchor Stakes ***Vessels*** 1 boat ***Personnel/Shift*** 5 total (1 supervisor, 2 slick bar operators, 1 vessel operator 1 responder) **Tending** ***Vessels*** 1 boat ***Personnel/Shift*** 2 Total (1 vessel operator, 1 responder)	Brayton Point Facility Brayton Point Boat Ramp	**Power Plant operation**	
02	**Brayton Point Salt Marsh**			**Deployment** ***Equipment*** 600 ft 21" boom ? Anchor Sytems ? Anchor Stakes ***Vessels*** 1 boat ***Personnel/Shift*** 5 total (1 supervisor, 2 slick bar operators, 1 vessel operator 1 responder) **Tending** ***Vessels*** 1 boat ***Personnel/Shift*** 2 Total (1 vessel operator, 1 responder)	Brayton Point Facility Brayton Point Boat Ramp Neighborhood access from east		
PR							