

JOINT INDUSTRY
OIL SPILL PREPAREDNESS AND RESPONSE
TASK FORCE



SECOND PROGRESS REPORT on INDUSTRY
RECOMMENDATIONS to IMPROVE OIL SPILL
PREPAREDNESS and RESPONSE

November 16, 2012

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LIST OF ACRONYMS

AC	Area Committee
ACP	Area Contingency Plan
APD	Application for a Permit to Drill
API	American Petroleum Institute
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CRRC	Coastal Response Research Center
DWH	Deepwater Horizon
EDRC	Effective Daily Recovery Capacity
EPA	Environmental Protection Agency
ESI	Environmental Sensitivity Index
FACA	Federal Advisory Committee Act
FDA	Food and Drug Administration
FOSC	Federal On-Scene Coordinator
GOMRI	Gulf of Mexico Research Initiative
IC	Incident Commanders
ISB	In-Situ Burning
IPIECA	International Petroleum Industry Environmental Conservation Association
JITF	Joint Industry Task Force
JIP	Joint Industry Project
LLIS	Lessons Learned Information Sharing
MOU	Memorandum of Understanding
NEBA	Net Environmental Benefit Analysis
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanographic and Atmospheric Administration
NPRM	Notice of Proposed Rulemaking
NRT	National Response Group
NTL	Notice to Lessees
OGP	International Association of Oil & Gas Producers
OOC	Offshore Operators Committee
OSHA	Occupational Safety and Health Administration
OSPR	Oil Spill Preparedness and Response
OSPRS	Oil Spill Preparedness and Response Subcommittee
OSR JIP	Oil Spill Response Joint Industry Project
OSRO	Oil Spill Removal Organization
OSRP	Oil Spill Response Plan
PHMSA	Pipeline and Hazardous Materials Safety Administration
PPE	Personal Protective Equipment
PREP	Preparedness for Response Exercise Program
R&D	Research and Development
RRT	Regional Response Team
SMART	Special Monitoring of Applied Response Technologies
SONS	Spill of National Significance
SPE	Society of Petroleum Engineers
TAD	Technical Assistance Document
US	United States

USCG United States Coast Guard
VOO Vessels of Opportunity
WCD Worst Case Discharge

1. Introduction

In the two years since the oil and gas industry (Industry) convened the Joint Industry Oil Spill Preparedness and Response (OSPR) Task Force (JITF), API's OSPR Subcommittee (OSPRS) and Technical Workgroups have progressed twenty five projects under seven work streams to address recommendations made by the JITF (see Appendix A for an overview of this project organization). This report is a follow-up to the November 2011 progress report, titled *Joint Industry Oil Spill Preparedness and Response Task Force Progress Report on Industry Recommendations to Improve Oil Spill Preparedness and Response*¹. The 2011 progress report detailed the JITF development and organization, collaboration with stakeholders, and the current status, at that time, of each project under the JITF. While 2011 largely involved getting organized and initiating work, 2012 saw significant progress on a number of projects/deliverables, many of which are nearing completion. 2012 also involved continued outreach/interaction with key stakeholders both domestically and internationally. Finally, in 2012 the OSPRS developed a communications plan and revamped the API website where deliverables and key information related to oil spill preparedness and response will be housed for public consumption. This 2012 report provides a progress update on the JITF's activities since the completion of the 2011 report. In addition to the JITF project updates, there is also a discussion of ongoing project work under API's Inland Oil Spill Response Program.

2. Oil Spill Preparedness and Response Joint Industry Task Force Coordination

The JITF continues to engage and coordinate with the Federal and state governments. API and members of the JITF continually brief agencies on JITF progress, and most of the JITF projects involve government representatives as either project team members or in an advisory capacity. In addition to seeking government input, the JITF continues to actively monitor, participate in, and/or comment on government Oil Spill Response (OSR) efforts in the wake of Deepwater Horizon (DWH), including:

- National Response Team (NRT) Subsea Dispersant Monitoring and Assessment Interim Guidance
- U.S. Government Accountability Office (U.S. GAO) report on dispersant research
- Revisions to the National Preparedness for Response Exercise Program (PREP) Guidelines
- NRT Volunteer Guidelines
- Interagency Coordination Committee on Oil Pollution Research
- U.S. Coast Guard (USCG) Equipment Surge Workgroup
- Bureau of Safety and Environmental Enforcement (BSEE) Notice to Lessees (NTLs) related to oil spill response planning

The JITF has also maintained close linkages to international efforts. In the past year, the JITF has engaged in extensive coordination with the International Association of Oil and Gas Producers (OGP) Oil Spill Response Joint Industry Project (OSR JIP). The OSR JIP has a program similar to the OSPR JITF, with several projects related to JITF recommendations. As some of the OSR JIP projects are similar in scope to JITF projects, the groups compared and aligned their projects to minimize duplication of efforts, and identified areas where one program can support the other. The JITF has also coordinated with another JIP specifically focused on the Arctic. While the API OSPR projects are broader in nature, great effort has

¹ <http://www.api.org/~media/Files/Oil-and-Natural-Gas/Exploration/Offshore/OSPR-JITF-Project-Progress-Report-Final-113011.ashx>

been made to ensure there is no duplication of work and the projects complement one another wherever possible.

In addition to maintaining linkages to other industry JIPs, the JITF is also coordinating with the Global Response Network (GRN) of Tier 3 oil spill response cooperatives. The GRN has formed operational teams to develop and share best practices in the areas of offshore recovery, nearshore/shoreline response, dispersants, in-situ burning, remote sensing, and response management.

3. Joint Industry Task Force Project Updates

Since the last JITF Progress Report published in November 2011, extensive work has been completed on many of the individual projects across all seven work streams².

3.1 Planning

3.1.1 Planning Guidelines for Oil Spill Response Plans

To address several of the response planning recommendations, a project team was formed to develop a guidance document on preparing more functional and effective Oil Spill Response Plans (OSRPs). The document focuses primarily on OSRPs for offshore facilities, but may, if appropriate, be applicable to other marine facilities as well. The group designed an OSRP outline and suggested content that is highly functional and effective while enhancing access to critical response information. The document is designed to comply with the content requirements of 30 Code of Federal Regulations Part 254 and the OSRP related NTLs.

Key design elements of the recommended OSRP organization include:

- Response information provided in the general order it is required during an incident.
- Primary focus on the first few days of an incident when response guidance is needed most.
- A Quick Guide that contains only the information required in the first few hours of an incident and designed such that it can be removed from the OSRP itself for use on the deck of a platform, rig, response vessel, etc.
- Key information presented in tabular or graphical formats whenever possible to provide quick access and enhance comprehension.
- Similar information is located in a single section whenever practicable to further facilitate quick access.
- Reference and non-response specific information is included in the Appendices.
- Guidance on escalating a response from a Tier 1 to a Tier 2 or 3 is included as is guidance on establishing a Vessels of Opportunity (VOO) program and calculating the oil budget as well as many other spill response components.

The draft OSRP guidance document was completed in July 2012 and has been submitted to both BSEE and the USCG for review and comment. Once comments have been received from these agencies, the document will be revised accordingly with additional minor changes made to address new recommendations in the recent BSEE NTL for oil spill response plans (NTL 2012-N06). Industry has requested that BSEE consider the content of this document in the development of its planned Notice of

² For the OSRP JITF Project Organization chart please see appendix A.

Proposed Rulemaking (NPRM) on response plans. The OSPRS is considering whether to eventually convert the guidance document into a formal API recommended practice.

Status: Expected completion by year end 2012

3.1.2 Sharing of Company Personnel

A project team was formed to identify key issues that must be considered in lending company personnel to support an Industry incident command post or field response operation. Issues identified include liability, compensation, safety, compliance, and human resources policies. The team also evaluated the range of legal approaches and instruments that could be employed to address these concerns.

The team, comprised of Industry members, held several meetings and drafted a model agreement that could be used for lending key personnel during an incident. This model agreement will be made available to members for their use during a response as desired. This model agreement was also shared with the OGP's OSR JIP which is looking to develop something similar for use in non-U.S. jurisdictions.

Status: Complete

3.1.3 Sharing of Oil Spill Removal Organizations' Resources

The OSPRS has held discussions with Oil Spill Removal Organizations (OSROs) and the Federal government on this subject. There are commercial and legal barriers to OSROs sharing resources with non-members. Moreover, the Federal On-Scene Coordinator (FOSC) retains the right to direct the obtainment of additional OSRO resources either through the Responsible Party or directly. Under the Oil Pollution Act of 1990 (33 U.S.C. § 2701, et seq., commonly referred to as "OPA 90"), the FOSC has clear authority to coordinate all Federal, state and private actions; order specific action and impose specific requirements; directly supervise implementation; and even assume control over all response actions, including the contracting of private resources (and seeking reimbursement later). In fact, the Federal government has a Basic Ordering Agreement in place with at least one major OSRO to facilitate Federal access to response resources.

The USCG recently formed an Equipment Surge Workgroup to address a variety of issues related to improved sharing of resources (both personnel and equipment) and the cascading of equipment across the country, particularly during a spill of national significance (SONS). Industry is providing input into this effort within the bounds dictated by the Federal Advisory Committee Act (FACA).

Both Industry and government view this as an important subject, and the API OSPRS will continue to stay engaged to identify new opportunities for greater resource sharing. Section 3.1.5 addresses the related issue of cascading resources across geographies.

Status: Continue to Monitor

3.1.4 Recommended Practice for Worst Case Discharge

This project was completed before the release of the 2011 progress report. Below is the summary from that report.

In response to the DWH incident, Bureau of Oceanic Energy Management, Regulation and Enforcement (now Bureau of Ocean Energy Management (BOEM)) issued NTL 2010-N06, which required information on estimated WCD be submitted to BOEM as part of an application for a permit to drill (APD). Initially, little direction on how to calculate the WCD was provided by BOEM, so the Offshore Operators Committee (OOC) asked the Society of Petroleum Engineers (SPE) to form a task force to develop consensus best-practice guidelines for calculating WCD.

The SPE Gulf of Mexico Incident Response Task Force worked with the OOC and the Offshore Technology Research Center to bring together Industry, academic, and government experts to develop consensus guidelines on how to calculate WCD in compliance with the NTL. This Task Force developed and published in the public domain a guidance document³, “Guidance for Complying with BOEM NTL No. 2010-N-06 on Worst Case Discharge for Offshore Wells” on September 8, 2010 to address this requirement.

The guidance document stated that it was not an endorsement of the methodology put forth by the NTL for WCD calculation, but it did provide clarity and consistency on what BOEM wanted to see in the WCD submittal. This clarity allowed operators to prepare WCD calculations that satisfied BOEM’s requirements, and allowed BOEM to accept APD applications and start the review and approval process.

The OSPRS felt that this guidance document fulfilled the immediate objective of enabling operators to comply with BOEM regulatory requirements for WCD calculation, and therefore decided to forego developing additional guidelines/recommended practice at this time. In the future, this issue may need to be revisited, as the SPE Task Force indicated they did not necessarily agree with the BOEM methodology. Any future efforts to change this methodology would need to be considered in the context of promoting changes/enhancements to existing regulations. Due to the technical nature of these calculations, and the potential global application of such a recommended practice, this effort may be better handled by an international advisory body, like SPE, as opposed to a US-based body like API.

Status: Complete/Continue to Monitor

3.1.5 Memorandum of Understanding for Cascading Equipment

Shortly after the September 3, 2010 report was finalized, Industry contacted the USCG about the prospect of developing a Memorandum of Understanding (MOU) between government and Industry to address cascading of resources in the event of an incident. This MOU would lay out general policies, procedures and responsibilities for public and private sector acquisition of resources from other geographic regions, including international regions, to respond to an incident.

While an approach to spill response based on cascading of resources is favored by Industry as most effective and realistic, there are substantial legal liability concerns as well as a need for relief/waiver from regulations at the Federal and state level that exist as potential barriers to promoting cascading of resources.

As discussed above, the USCG has formed an Equipment Surge Workgroup to address a variety of issues related to improved sharing of resources (both personnel and equipment) and the cascading of equipment particularly during a SONS. Industry is providing input into this effort within the bounds dictated by the FACA. The most recent USCG Equipment Surge workshop was held in August 2012. Industry representatives from API and the OSROs were in attendance, delivered presentations, and assisted in the brainstorming/development of possible next steps re: sharing resources across international borders, logistics, legal/regulatory barriers, and contingency planning.

Industry remains committed to exploring options with the government to promote enhanced cascading of equipment both domestically and across international borders.

Status: Ongoing

³ www.spe.org/notes/wp-content/uploads/2010/09/spe_wcd_final.doc

3.1.6 Deepwater Horizon Technology Evaluation

A team was formed to develop and implement a process for evaluating new, or new applications of, mechanical recovery technologies or systems used in the DWH response. The objective was to identify technologies or systems that were most effective in mechanical oil recovery as well as identifying the associated optimum range of operating conditions. An independent consulting firm was selected to assist with the project and prepare the report.

The following approach was pursued:

- A questionnaire on various mechanical recovery systems/technologies, their effectiveness and operating conditions, was developed and submitted, via an online survey, to representatives of several OSROs, regulatory agencies, and consultants who were intimately involved in the DWH mechanical recovery operations.
- The survey responses were then compiled and those respondents that appeared to have the most comprehensive knowledge of mechanical recovery effectiveness were targeted for verbal or face-to-face interviews to obtain additional information on DWH mechanical recovery operations.
- The data from the survey and interviews was to then be compiled and a report prepared summarizing the assessment process and results as well as highlighting any systems or technologies that could benefit from further research and development (R&D).

Due to ongoing litigation associated with the DWH incident, most survey recipients and individuals targeted for interviews declined to participate at this time. Legal concerns also precluded the USCG and BP from sharing DWH mechanical recovery information that they have compiled. An interim report will be prepared by the end of 2012 summarizing the limited information that was received. A second round of data gathering will be considered at a future date.

Despite challenges associated with formally evaluating and documenting mechanical recovery technologies/approaches utilized during DWH, evidence suggests that less formal information sharing on those technologies that worked well under particular circumstances (as well as those technologies that did not work well) has occurred. This knowledge sharing has helped inform response planning and equipment augmentation/replacement decisions by operators and OSROs.

Status: Partially complete

3.1.7 Lessons Learned Sharing

This project was completed before the release of the 2011 progress report. Below is the summary from that report.

In its effort to establish a protocol for systematic gathering and archiving of lessons learned, the OSPRS has identified the Federal Lessons Learned Information Sharing (LLIS) website⁴ as a suitable vehicle to collect and house this information. A quick guide and a Frequently Asked Questions document on how to register for the website as well as guidance for Industry on how to search for oil spill lessons learned has been developed and made available for use.

Status: Complete

3.1.8 Volunteer Guidelines

⁴ <https://www.llis.dhs.gov/index.do>

In April 2012, API commented on a draft set of Volunteer Guidelines created by the NRT. Overall, feedback was that the document was useful and highlighted a number of issues that Industry could support. While the OSPRS is supportive of coordination between public sector agencies as they determine how to use volunteers, it was not in a position to comment on the manner in which agencies communicate and coordinate with one another regarding use of volunteers. Moving forward, the Volunteer Workgroup and the OSPRS as a whole remain committed to providing feedback and input to the NRT as they continue developing their Technical Assistance Document (TAD) or other guidance documents related to the use of volunteers.

Status: Ongoing

3.1.9 Improvements to Training and Exercises

The project team is working to enhance training and exercises for incident response. In February 2012, The USCG, Environmental Protection Agency (EPA), Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA), and BSEE published a request⁵ for suggestions to revise the National Preparedness for Response Exercise Program (PREP) guidelines. The project team provided comments, and looks forward to discussing potential improvement opportunities to the PREP guidelines when the agencies schedule public meetings. Currently, the project team is sharing company best practices on training and exercise programs and is considering creating a guidance document or API Recommended Practice document for training and exercises.

Status: Ongoing

3.1.10 Area Contingency Plan Enhancements

Industry supports the government's ongoing efforts to review all Area Contingency Plans (ACPs) in the wake of the DWH incident and make changes as appropriate. The OSPRS formed a team to monitor government progress on revisions to ACPs and offer assistance/input to the review/update process. Industry representatives have and will continue to attend Area Committee (AC) meetings. To date, Industry has participated in the following AC activities:

- The New Orleans Sector AC has drafted an ACP development plan, which is currently under review by the State of Louisiana. The AC has asked for Industry input on a number of ACP aspects, including: Training and Exercises, Response Science and Technology, Salvage Marine and Firefighting and Worst Case Discharge (Onshore and Vessel).
- District 8 plans to convene a panel on Regional Response Plans and ACPs at Clean Gulf on November 15, 2012 with Industry participation
- Industry has participated in a number of Houston/Galveston AC meetings.

Status: Ongoing

3.2 Dispersants

3.2.1 Develop Improved Communication Tools

The project team is developing a series of risk communication tools aimed at a variety of audiences. This is being performed in concert with other dispersant-related oil spill response activities occurring around the globe (e.g. International Petroleum Industry Environmental Conservation Association (IPIECA) and the OGP).

⁵ <http://www.gpo.gov/fdsys/pkg/FR-2012-02-22/pdf/2012-4021.pdf>

Specifically, a contracting firm specializing in risk communications has prepared fact sheets on the following topics.

- Introduction to Dispersants
- Human Health and Safety Considerations for Dispersant Use
- Fate of Oil and Weathering
- Toxicity and Dispersants
- Dispersant Use Approvals in the US
- Assessing Dispersant Use Trade-offs
- Aerial and Vessel Dispersant Operations
- Subsea & Point Source Dispersant Operations
- Dispersants Use and Regulation Timeline
- Dispersant Use in the Arctic Environment

Final review of these fact sheets by the project team and other key stakeholders is underway.

In addition to the development of fact sheets, the need to communicate the basics of oil spill dispersants through materials that are not as in-depth as the fact sheets or other, more detailed sources of information was identified. As such, high level communications materials were created and will be used as educational materials as well as website and presentation content. The primary goal of this effort was to develop a product that can benefit the entire stakeholder community by providing a suite of mutually acceptable materials. The Dispersant Communications Project Team believes that consistency in message will be more effective in educating the broader public on the value of dispersant use. The end product has been reviewed by representatives from government agencies and industry and is currently in the stages of finalization.

The team is currently examining the best methods for sharing these work products as effectively as possible, e.g., internet-based and hard copy materials, presentations at meetings.

In addition to the preparation of communications materials, the project team carried out several other key activities during 2012:

Outreach Workshops on the Eastern Shores of Virginia and Puget Sound, Washington State

These regional, public workshops involved participation by both Industry and government. They have provided structured opportunities for representatives responsible for developing or implementing policies and procedures related to response communications during oil spill incidents to focus on and discuss effective dispersant communications with stakeholders such as the media and general public, elected and appointed officials, local community members, fishermen and other government agencies (e.g., EPA regarding the dispersant listing process and the US Food and Drug Administration (FDA) for seafood safety). Attendance has been good and feedback has been positive. A summary of this work is to be presented during the Clean Gulf Conference, 2012 and will be housed on the API Oil Spill Website. A third workshop is planned for 2013 in either Florida or Alaska.

Workshop to Develop a Survey Template to Measure Effectiveness of Communications Activities

The primary goals of the workshop, which was attended by academic, Industry and government agency representatives, were to:

- Update the ecological effects of dispersant use on the marine oil spills decision model, and expand the scope to other aspects of oil spill response, including potential public health effects.
- Use this revised decision model to update survey tools that will be distributed to participants in workshops on dispersant use, and other oil spill response options. The surveys will also be shared with government (e.g., Regional Response Teams (RRTs)).

The completed surveys will provide substantive data about decision maker and key stakeholder perceptions regarding oil spill response options. This data will help inform the advancement of oil spill response communications (i.e., how to improve the content of science-based communications).

Status: Ongoing

3.2.2 Panel to Evaluate/Recommend Studies

A project team was formed to evaluate emerging studies from DWH and to suggest and evaluate additional research where appropriate. Two distinct R&D needs and assessment activities have been identified by the project team and include 1) interaction with research entities; and 2) published research evaluation.

Recognizing the need to interact with R&D consortia and other oil spill response-related research groups, members of the project team engaged in the planning and execution of a number of meetings during 2012 and in to 2013, the goal being to provide input and balance and to make broader contact with the wider R&D community. These included:

- American Chemical Society National Meeting – Symposium on the Environmental Fate of Dispersants Used in Oil Spills, San Diego, CA , April, 2012
- Clean Pacific Conference, Long Beach, CA, May, 2012
- Clean Gulf Conference, New Orleans, LA, November, 2012
- European Maritime Safety Agency- Workshop Addressing Oil Spill Dispersant Use Following the Deepwater Horizon Incident, Lisbon, Portugal, November, 2012
- Arctic Technology Conference, Houston, TX, December, 2012
- Gulf of Mexico Oil Spill and Ecosystem Science Conference, New Orleans, LA, January, 2013
- American Chemical Society National Meeting – Symposium on the Environmental Fate of Petroleum Oils and Dispersants in the Marine Environment, New Orleans, LA, April, 2013

Additionally, the project team has been actively engaged with specific research consortia that were formed in response to the Gulf of Mexico Research Initiative (GOMRI). In particular, an API-sponsored meeting between Industry, government and GOMRI consortia researchers was held on January 10-11, 2012, in Baton Rouge. This workshop, which was developed in conjunction with the Coastal Response Research Center (CRRC) and served as the first stage of an ongoing dialog aimed at providing input to new oil spill response research and development. The objectives included:

- Review previous and on-going R&D being conducted by academia, governmental agencies and Industry.
- Present newly funded projects for awareness of what types of research are being conducted.
- Evaluate mechanisms for scientific exchange and coordination of oil spill response R&D efforts going forward.

These efforts are seen as opportunities to solidify a working relationship with government, Industry, and academia that will be involved in Gulf of Mexico oil spill-related research in the foreseeable future. It is expected that there will be at least annual meetings of the key research community members coordinated by the project team. Attendees found the meeting to be effective with respect to the establishment of research contacts and a more focused meeting is being planned for the first half of 2013, again to be coordinated by the CRRC, to better understand the research that was initiated as a result of significant GOMRI funding.

In addition to direct interaction of researchers and the resultant exchange of ideas, there is a need to review, evaluate, and possibly address published research results in a timely manner. To this end, the creation of a review panel is considered to be an important step. The project team defined the following components as key elements of an ongoing process:

- Define key review panel members:
 - Industry;
 - Government Agencies; and
 - R&D Organizations (e.g., National Laboratories, Academia, etc.).
- Use a contractor to facilitate collection and dissemination of materials for review.
- Meet quarterly via teleconference to assess recent publications.
- Evaluate publications and make recommendations regarding response if warranted.
- Meet annually face-to-face to review actions, outcomes and determine paths forward.

Industry is actively seeking participation by government agencies and R&D organizations to participate on this panel. The project team is in the process of selecting a contractor to help organize and administer this work. In recognition of the importance of this activity, OGP has agreed to share the cost of this effort and are actively engaged in the proposal review process.

It is expected that outcomes from the panel will result in improved decision making, planning, models, and tools, as well as promising avenues for additional research.

Finally, open house opportunities are being planned for academic researchers at the BSEE-managed OHMSETT wave tank test facility in New Jersey. The goal of these three, one-day sessions is to allow academic researchers, especially those being funded by GOMRI, to see first-hand the manner in which dispersants work in a near real-world test setting. Past experience has shown that the ability to observe the action of dispersants in the large scale OHMSETT tank is an effective way to convey their ability to disperse oil slicks in a manner that small-scale, experimental tests cannot. Classroom sessions will also serve as an integral part of the day's activities. A proposal has been received from OHMSETT with a planned demonstration during the first half of 2013.

Status: Ongoing

3.2.3 Subsea Injection

Subsea dispersant injection is a novel technique that was used effectively during the DWH response and Industry has incorporated this tool in response plans for deep water wells. To support its use, Industry has developed a large-scale, multiple-year Subsea Dispersant Project to address all subsea dispersant JITF recommendations. The objectives for the project include:

- Effectiveness: Develop subsea injection methods and equipment and evaluate effectiveness

(laboratory and field experiments, if necessary).

- Fate and Effects: Evaluate the biodegradation, bioaccumulation and toxicity of dispersed oil on deep water communities.
- Modeling: Enhance existing numerical tools to track dispersed oil plumes resulting from subsea injection.
- Monitoring: Evaluate field monitoring criteria and provide a recommended monitoring plan.
- Communications: Conduct Net Environmental Benefit Analysis (NEBA) and perform regulatory outreach.

Activities completed in 2012 and planned for 2013 include:

Effectiveness

The goal of this task is to evaluate the effectiveness of subsea dispersant injection for a range of potential well control event scenarios and injection methods. The primary effort in this task will be the completion of scaled laboratory testing and potentially field testing. The need for field testing will be determined after completion of the scaled testing.

Scaled testing was initiated in early 2012 using a SINTEF (a Norwegian research company) 6 meter (m) tall by 3 m diameter tower basin. The first phase test results have been received and are being reviewed. SINTEF has also been awarded a contract to initiate Phase II of the effectiveness testing effort, building on the data developed during the initial round of experiments. In response to recommendations noted in the GAO report, *Oil Dispersants: Additional Research Needed, Particularly Subsurface and Arctic Applications*⁶, the Effectiveness Team has begun researching facilities capable of evaluating the effects of subsea dispersant use under deep water pressures.

Industry has maintained an active dialogue with the Federal government at both the Headquarters and Regional level throughout the development of the project. The Subsea Dispersant Injection Steering Committee lead has presented the research plans to the Interagency Coordinating Committee of Oil Pollution Research (ICOPR) and to participants of the Clean Gulf Conference.

The project team is actively dialoging with Federal agencies through the ICOPR about the prospects for and challenges of conducting field trials.

Fate and Effects

The goal of this effort is to generate information on the biodegradability and toxicity of dispersants and dispersed oil in deep water environments.

The project team held a successful workshop in October 2012 to develop a framework for protocols to be used during biodegradation and toxicity testing. The workshop brought together subject matter experts in chemistry, deep water ecology, microbiology, and toxicity within academia, government, and Industry. Recommendations from the workshop will be incorporated into requests for proposals to conduct biodegradation and toxicity testing in support of the project's objectives. These studies should commence in 2013. Additionally, the findings from the workshop will be submitted to the Integrated Environmental Assessment and Management (IEAM) Journal for publication.

Modeling

Prior to the DWH response, existing deep water blowout models were not equipped to predict the

⁶ <http://www.gao.gov/assets/600/591232.pdf>

change in plume dynamics that occur when dispersants are injected. Under this effort, the team intends to upgrade existing deep water blowout models. This project is underway and a group of experts from Texas A&M University, Massachusetts Institute of Technology, and Temple University have been contracted to perform the work. This group will evaluate existing models for predicting droplet size distributions when an untreated and treated oil jet is discharged into water. They will then compare droplet size predictions from these algorithms to existing, well-known data. From this comparison, the group will determine which model most accurately predicted these results and identify areas in which the model could be improved. This model will be incorporated into an integrated plume model for predicting the trajectory of dispersed oil plumes generated in deep water both with and without addition of dispersants. The project team held a modeling workshop in October 2012 to initiate the project and identify promising droplet-size subroutines.

Monitoring

The project team developed an interim recommended monitoring plan that was submitted to the National Response Team to provide Industry's position on subsea dispersed oil monitoring. A key aspect of this interim recommended monitoring plan was to utilize existing monitoring tools that could provide immediate information to support operational decision making. Another key aspect of the monitoring plan is to stage the monitoring requirements to allow rapid implementation of easily deployable tools followed by placement of more complex monitoring tools as the event proceeds.

Another accomplishment was the completion of a report that describes existing and emerging monitoring tools that could be used to inform oil spill response decision makers. The project team intends to develop a final recommended monitoring plan after tools identified in the report have undergone further assessment and validation.

Communications

The team has developed a communications plan to keep the OSR community, regulators, other stakeholders, and interested parties updated with these efforts. This plan includes the establishment of technical advisory committees (including government officials), staffed by appropriate experts, for each technical project task. In addition, the Communications Team will continue to issue project newsletters as important research is generated. The first newsletter can be read online at <http://www.api.org/environment-health-and-safety/clean-water/oil-spill-prevention-and-response/api-jitf-subsea-dispersant-injection-newsletter.aspx>. The next newsletter is scheduled for completion in late 2012 or early 2013.

Status: Ongoing

3.2.4 Review Surface Application Techniques

Initial lessons learned from operational teams of the DWH response incident regarding targeting and application capabilities suggest that there were many complications to dispersant use that surrounded application. While aerial application technology was adequate and effective, protocols for targeting were evolving and cumbersome and delays often resulted in a less than optimal use of dispersant assets.

In response, a project team was formed to address improvements in this area and review surface application techniques and processes to validate safety margins and promote effective and efficient dispersant application. Existing Lessons Learned documents from the many participants of the DWH response were reviewed and analyzed in detail.

Based on this analysis, the project team has developed a draft *Aerial and Vessel Dispersant Operations and Management Plan*. This plan, structured in a fill-in-the-blank format, was submitted to the API

OSPRS in early October and is currently undergoing review. Following this review, the document will be provided to key government stakeholders for their review and comment. Upon finalizing the document in early 2013, it will initially be made available in the form of a guidance document. Consideration will be given to ultimately converting the guidance document to an API Recommended Practice.

Status: Ongoing

3.2.5 Improvements to Decision-Making and Use

Industry remains actively involved in efforts to improve dispersant decision-making and use. In addition to work on the four dispersant projects described above, Industry has maintained regular dialogue with Federal agencies on dispersant use and decision-making (surface and subsea). Industry has met regularly with officials from USCG, BSEE, National Oceanic and Atmospheric Administration (NOAA), and EPA at the Federal and Regional levels (i.e. RRTs) and provided data/studies/input proactively and upon request. For example, Industry has provided detailed input to the NRT in its efforts to develop appropriate monitoring guidelines for dispersant use. Industry also provided extensive information to the U.S. GAO to assist in developing its report titled *Oil Dispersants: Additional Research Needed, Particularly Subsurface and Arctic Applications*.

Industry plans to remain actively engaged in government efforts to promote efficient decision-making regarding dispersant use under appropriate circumstances.

Status: Ongoing

3.3 Shoreline Protection and Cleanup

3.3.1 Recommended Practice for Personal Protective Equipment

A team was formed to develop an API Recommended Practice document on Personal Protective Equipment (PPE) used during shoreline cleanup after a spill response. The team includes representatives from both Industry and Federal government (Occupational Safety and Health Administration (OSHA), National Institute for Occupational Safety and Health (NIOSH), and the USCG). The team has been meeting throughout the past year to develop and edit the document. Its content includes:

- Hazard Analysis and Risk Assessment
- Required Training
- Mitigation related to identified hazards for oil spill responders, such as:
 - Severe Weather
 - Fatigue and Stress of PPE
- PPE recommendations for:
 - Respiratory Protection
 - Skin Contact and Absorption
 - Hearing Protection
 - Slips, Trips and Falls
 - Wildlife and Vector-Borne Diseases
 - Responders near Traffic, Heavy Equipment and All-Terrain Vehicles
 - Water Safety

- In-Situ Burn

The document is undergoing final API review prior to being submitted for approval through the API balloting process. Upon acceptance (expected in early 2013) the document will be available for widespread use.

Status: Pending Review and Publication

3.3.2 Assess Shoreline Protection Technologies

A project team formed to evaluate various technologies for shoreline protection and cleanup. This is a large scale, multiple-year project involving eight separate projects. The project team includes members from Industry, Federal and state government, and academia. The team has completed the research and developed best practices documents for:

- Berms and Tidal Barrier Strategies for Oil Spill Response- this study documents the lessons learned from the DWH incident and captures best practices and provides guidelines for utilizing berms and barriers in future spills.
- Improving Sandy Beach Cleanup- this study documents the lessons learned from the DWH incident and captures best practices and provides a field guide for key technologies to use in future spills in the area of beach sand cleaning.
- Detecting Subsurface Buried Oil on Beaches- this study documents the lessons learned from the DWH incident and captures best practices and provides a field guide for key technologies to use in future spills in the area of detecting subsurface oil on beaches.

The above studies will be submitted to the API OSPR Subcommittee for final review and comment in the near future prior to being made available for wider consumption.

Ongoing projects for the team include:

- Completing the research study of Enhancement of Nutrient Enrichment Knowledge & Exploration of Microbe Usage in Bioremediation;
- Completing a research study and developing a guidance document on oil spill response measures in coastal wetlands/ salt marshes;
- Completing a research study to develop technologies that detect and recover submerged tar mats in near shore areas; and
- Completing research on developing tidal inlet protection strategies (TIPs) & tidal flow baselines.

These projects are scheduled for completion in 2013. Upon completion, the project team will assess the need for a specific engagement plan to share and discuss the document with government entities.

Status: Ongoing

3.3.3 Environmental Sensitivity Index Mapping

Industry understands that there are a number of Environmental Sensitivity Index (ESI) Maps for the Gulf Coast that are either currently in the process of being revised or are planned to be rewritten once suitable funding can be identified. At this time, the OSPRS is continuing to work with NOAA to determine the best manner in which these funds can be committed as well as how best to apply the funds to ensure that they provide value. It is expected that this commitment will be made in 2013.

Status: Ongoing

3.4 Oil Sensing and Tracking

3.4.1 Assess Remote Sensing Technologies

The remote sensing technical working group, consisting of members from Industry and Government, has held routine face-to-face meetings throughout 2012 to share knowledge in the area of remote sensing technologies used during oil spill responses and to work on a variety of deliverables. One of the key deliverables for 2012 is the development of a planning guide, "Remote Sensing in Support of Oil Spill Response," to assist in the identification of surveillance technologies, sensors, and platforms that can enhance recovery efforts and assist in directing response resources to areas where they can provide the greatest value. The document will provide information related to both strategic and tactical response activities.

This guide, scheduled to be completed in early 2013, is designed to be a practical "Users Guide" as well as a planning and preparedness tool that supports oil spill preparedness. Also included in the document is an appendix that summarizes current commercial and academic efforts related to 1) scientific research and development activities, 2) published peer reviewed scientific papers, and 3) external "lessons learned" developed by others in the area of remote sensing and surveillance of oil spills. The group plans to continue meeting in 2013 to share recent experiences, collaborate on potential technology areas that need development, and to disseminate scientific findings in the field of remote sensing that will enhance the capabilities and readiness for response.

Status: Ongoing with expected completion in early 2013

3.5 In-Situ Burning

3.5.1 In-Situ Burn Program

The OSPRS created the In-Situ Burn (ISB) Program to encompass all OSPR JITF recommendations made regarding ISB. The overall Program objective is to provide information and tools to encourage Industry, responders, regulators, and other stakeholders to consider and use this response tool. This is a large scale, multiple-year program whose team members include Industry, state and federal government, responders, and external experts or advisors. The ISB Program has eight separate projects, of which six are active at present with the last two commencing in 2013:

1. Revision of two 2005 API Publications: *In-Situ Burning: A Decision Maker's Guide to In-Situ Burning* (#4740) and *In-Situ Burning: The Fate of Burned Oil* (#4735)

The breadth and scope of both API publications was examined to identify content preferences and set the desired expectations for the level of detail against user preferences plus updating the content on marine offshore burns and inland/upland burns. Operations information is being excluded and will instead be addressed in the Operations Manuals project, described hereafter. A contractor was selected and has submitted a merged, revised document for review by the project team.

2. Soil Heating from Inland/Upland Burns

Burning surface releases transmits a portion of the heat from combustion into the soil. The intensity of a burn and its elapsed time influence the amount of heat transfer and the potential for habitat impact. A Statement of Work (SOW) was developed with the US Forest Service's Fire Laboratory to measure soil heating with a variety of soils and conditions, and a few petroleum products. Wide diameter cores for triplicate testing are being collected. The experimental design for different soil moistures and oil layer thicknesses is being vetted. A procedure to simulate oil weathering was selected (ASTM D2892, *Test Method for Distillation of Crude Petroleum*) and crude oil is being acquired for testing. Deliverables will

include presentations, manuscripts, and reports. Analytical results, including vertical heating profiles, will be used to develop an addition to the First Order Fire Effects Model for ISB planning support.

3. Ignition Enhancement Evaluation

The potential distances to surface release sites, difficulty of access, and/or sensitivity of habitats make the use of aerial platforms for ignition devices valuable for ISB. Currently, the aerial platforms and ignition devices used in ISB have had various constraints and this has therefore limited use during spill response. The objective of this project is to evaluate ignition devices and aircraft to improve their safety, burn reliability, targeting precision and accuracy. Two advisory groups have been established and include: 1) burn experts from Industry and US Fire Services plus 2) aviation experts from Industry and US Fire Services. A formal liaison has been established with the OGP Aviation Subcommittee (ASC), which is the international group for the Industry's aviation guidance and expertise. The scope for this multi-year project was refined with the aid of the two Advisory Groups, and work will be conducted under a Cooperative Research and Development Agreement between API and the US Naval Weapons Station China Lake Team. Ignition devices will be evaluated for their performance with a variety of oils in small and lab-scale tests in advance of meso-scale tests with different launching platform options. The project entails outreach to manufacturers for possible prototype development to improve device function. A decision support tool will be developed to assist planners and operations staff with ignition device selection. Draft aviation guidance will be prepared for OGP's ASC consideration. Deliverables will include presentations, manuscripts, and reports.

This OSPRS project will be conducted in coordination with a related international R&D project under the OGP. The combined scope is intended to address the use of fixed- and rotary-wing platforms; potential development of new or modified igniters, meso-scale trials and possibly, field-scale testing. All reports are estimated to be completed by 2015.

4. Operations Manuals

Although there is a growing number of ISB guidance documents, there is a paucity of operations manuals. The objective of this project is to provide basic operational information and checklists for responders to better plan, train, and execute safe and successful burns. There will be two manuals, one each for inland operations and for on-water operations. An independent contractor was selected to support this project and has developed a draft of the manual that is currently under format and content review.

5. Guideline Development for Safety Officers and Industrial Hygienists

Outreach to ASTM Committee F20 on Hazardous Substances and Oil Spill Response and to the US National Response Team augmented the project team and helped with scoping. Requests for proposals were released and bids are under review. Contracting will be complete by the end of 2012. The work will include:

- Identification of burn scenarios which have the greatest safety and industrial hygiene concerns;
- Preparation of a safety guide for open water burns including air monitoring from vessels; and
- Identification of experience/knowledge desired for a safety officer.

The project team intends to engage RRTs via the NRT to facilitate alignment on technical content and policy, plus coordinate with the NRT's Worker Safety and Health Committee. Findings from this project will inform the conduct of both the Guideline Development for Selection and Training of Key In-Situ Burning Personnel and the Improvement of ISB Pre-Authorization Process projects.

6. Develop Guidelines for Selection and Training of Key In-Situ Burning Personnel

Outreach to ASTM Committee F20 on Hazardous Substances and Oil Spill Response and to the US NRT augmented the project team and helped with scoping. Response managers require certain information that includes their responders' skills and availability. Additionally, they must be cognizant of operational personnel training and experience requirements. A scope has been developed to:

- Examine known guidance and experience to produce new and relevant educational materials (e.g., 'job guides', guidelines, curricula, and/or standards);
- Develop consensus on selection and training of responders for ISB operations; and
- Identify and/or develop responder training opportunities.

Requests for proposal are being released; therefore proposal review and contractor selection is pending. The project team intends to engage RRTs via the NRT to facilitate alignment on technical content and policy. The vast amount of training materials from the US Fire Services and state counterparts provides excellent source material. Findings from this project will inform the conduct of both the Guideline Development for Safety Officers and Industrial Hygienists and the Improvement of ISB Pre-Authorization Process projects.

7. Improvement of In-Situ Burning Pre-Authorization Processes

Conduct of this project will benefit from the results of all the other ISB Program's projects. The scope is expected to include:

- Collaboration with the NRT and RRTs to update their pre-authorization processes;
- Support for any updates to the 2006 Special Monitoring of Applied Response Technologies (SMART) protocol⁷ for in-situ burning (e.g., USCG, NOAA, EPA, CDC, and BSEE) or other ISB guidance documents (e.g., ARPEL, CEDRE, IMO, etc.); and
- Development of burn scenarios and materials for use in spill response exercises to improve readiness.

This project will begin in 2013.

8. Revision of other API Publications

This project is not currently active. When new information or data indicates other API publications would benefit from technical and policy updates, a project team will be formed to conduct that work.

Status: 6 of 8 subprojects ongoing

3.6 Mechanical Recovery

3.6.1 Research & Development and Technology Tracking Program

The primary objective of this project is to develop a tracking spreadsheet or database for R&D activities that include, but are not necessarily limited to: 1) alternative response technologies; 2) shoreline protection; 3) mechanical recovery; 4) in-situ burning; 5) dispersants; 6) oil sensing and tracking; and, 7)

⁷ http://response.restoration.noaa.gov/sites/default/files/SMART_protocol.pdf

oil spill response planning⁸. The database entries focus on new, or newer, technologies and equipment and their application.

The project team has made good progress over the past year including refining the scope of work, issuing an RFP, and selecting a contractor to perform the work. Upon selection, the contractor developed the database and initiated a request for input from members of Industry, government, and academia. A large number of responses (approximately 120) have already been received and the contractor will provide the first round of data for API member review in December 2012. The project team is assessing the most appropriate means for sharing the database with all interested stakeholders. Data gathering will continue in 2013.

Status: Ongoing

3.6.2 Vessels of Opportunity Program

The Vessel of Opportunity (VOO) project team reviewed the VOO program used during Deepwater Horizon and other relevant information. The team then developed a VOO guideline document consisting of a set of high level principles for when and how to utilize VOOs vs. detailed procedures and contracting aspects.

After discussions with the JITF project team developing an Industry guideline for oil spill response plans, a decision was made by the OSPRS to include the VOO guidance information in the planning guidelines for offshore oil spill response plans (see 3.1.1). The VOO guidance information has been submitted to the Planning Guidelines for Offshore Oil Spill Response Plans project team for inclusion in the guidance document.

Status: Complete

3.6.3 Effective Daily Recovery Capacity Assessment

An Effective Daily Recovery Capacity (EDRC) project team formed shortly after the September 3, 2010 JITF report was issued. The project team continues to engage with USCG, BSEE, and the independent contractor chosen to evaluate the EDRC assessment process and provide recommendations. Industry understands the contractor has submitted a draft report to USCG and BSEE for review, and will be open to further discussion on the findings of the report. Industry has requested a copy of the draft report from the USCG and looks forward to the opportunity to review and comment on the draft upon its release.

Status: Ongoing

3.7 Alternative Technologies

3.7.1 & 3.7.2 Concurrent Incident Evaluation and Non-Incident Evaluation

The OSPRS formed a project team with members from Industry and government to optimize the process developed during DWH to evaluate alternative technologies that are offered at the time of a spill. Government team members include representatives from EPA, USCG, NOAA, and the California Office of Spill Prevention and Response. The team has completed the research and final document for the study of alternative technologies. The study includes recommendations for:

- Enhancing the existing Alternative Response Technologies Evaluation System (ARTES) process;

⁸ Note that these activities are not necessarily specific to mechanical recovery. The name of the API work group is a product of an earlier effort to scope OSR R&D in mechanical recovery, but the scope has expanded significantly to that illustrated in this proposal request.

- Documenting Interagency Alternative Technology Assessment Program (IATAP) lessons learned;
- Documenting other spill ARTES assessments;
- Recommending a clearinghouse and incentive program; and
- Developing an engagement plan with key government stakeholders.

The same project team which is reviewing concurrent incident evaluations also intends to engage in discussions for new technology incentives as well as mapping a way for information sharing across the different OSR entities.

In September 2012, the team completed the final study which documents the lessons learned from the DWH incident and recommends changes and alterations to the ARTs process for application in future spills. The study has been submitted to API for final legal review and publication.

Status: Pending publication

4. Inland Oil Spill Response Program

While not stemming from JITF recommendations (which focused on offshore response issues in the wake of DWH), API continues to support work in the area of inland oil spill response. At present, there are three projects being progressed under the Inland Oil Spill Response Program. For all three projects, the project teams have met several times throughout the year and have developed draft SOWs and RFPs. Each RFP is pending final review and release for bids. Most of the work will take place in 2013. The three projects include:

1. Air-Quality Monitoring and Associated Protective Measures

Liquid petroleum and petroleum products may contain volatile organic and inorganic compounds (VC) that could be released to the atmosphere during an oil spill. Exposure to some petroleum VCs might be an inhalation hazard to humans at certain concentrations over time. During a spill, incident commanders (IC) should establish a program to monitor air quality to facilitate public safety decision making. For example, when VC concentrations in the atmosphere are determined to exceed safe levels, ICs should take appropriate measures to warn and protect the public, who could be affected. Also, ICs would likely need to apprise the public of when VC concentrations in the atmosphere have returned to safe levels. The Inland Oil Spill Response work group will develop guidance on air-quality monitoring and protective measures for public safety during petroleum spill response.

2. Determining When Contaminated Soil Should Be Addressed

Petroleum released during a spill may contaminate soil. A variety of factors influence the transport rate of petroleum in surface soil—which for this project is from 0 feet to 5 feet below ground surface—to subsurface soil. During a spill an IC must prioritize various aspects of spill response, which would include cleanup of contaminated soil. Incorrectly prioritizing cleanup of contaminated soil could result in 1) prematurely tying up human and other resources that could be better utilized elsewhere in the spill response, or 2) excessive cleanup costs for addressing contaminated soil and other contaminated media (e.g., groundwater, buried structures, and so forth). Also, an IC would likely need to apprise the public of the measures being implemented to clean up contaminated soil. The work group will develop guidance for determining when contaminated soil should be addressed during petroleum spill response. This guidance will not address remediation techniques for petroleum-contaminated soil or other contaminated media.

3. Monitoring of Gasoline, Liquid-and-Vapor-Phase Trajectories

Responding to gasoline spills poses inherent risks to first responders and the public as a result of gasoline's volatility, toxicity, and flammability. These inherent risks can delay spill response until they can be qualified, quantified, and reduced to safe levels. Expedient situational awareness of these inherent risks would facilitate an IC's ability to make informed decisions regarding responder and public safety. Real-time, remote monitoring of gasoline liquid-and-vapor-phase trajectories during spill response, especially during the initial response phase, could enhance and expedite situational awareness. The work group will develop guidance on types of and implementation of available technologies for remote, real-time monitoring of gasoline, liquid-and-vapor-phase trajectories during spill response.

Status: Ongoing

5. Communications Strategy

In addition to the effort focused on individual projects, in the last year a great deal of emphasis has been devoted to the establishment of a communications strategy for the materials produced from the JITF. Specifically, project teams were asked to identify the audience for the various materials that have been or will be created. In some instances, these materials will be geared toward a very technical audience such as academia or government experts; while in others the audience may be less technical (e.g. media or general public). The OSPRS determined the best vehicle for housing these materials to allow for broad and sustained communication was a website.

API has had, for some time now, a website to communicate the basics of oil spill response (www.oilspillinfo.org), but it was not designed in such a manner to meet these new demands. As such, API is in the process of finalizing details of a new Oil Spill Response Website to replace its current version. In addition to providing basic information on oil spill prevention preparedness and response, the site will also house much of the materials developed throughout the entirety of the API Oil Spill Program detailed in this report. The intent of the site will be to provide technical information in escalating terms, depending on the level of review the reader chooses to pursue. In other words, information will be available in commonplace terms for broad audiences as well as technical terms for technical audiences. For those materials developed throughout this report, a specific tab has been established to allow the more technical reader direct access. The website is expected to be completed and available to the public within the next few months.

6. Conclusion

As described in this progress report, roughly half of the projects stemming from the initial JITF recommendations have been completed or will be in the next few months. A number of the remaining projects are part of large scale work programs (i.e., Dispersants, ISB, and Shoreline Protection) and while a number of milestones or subprojects have been completed there is still a substantial body of work to be performed over the next few years. A third category of projects essentially involve ongoing efforts by Industry to monitor and participate in government-led initiatives relating to:

- Cascading resources
- Use of volunteers
- ACP enhancement (including ESI mapping)
- Dispersant decision-making
- EDRC assessment

In addition to addressing JITF recommendation stemming from the DWH response, Industry is also progressing an active work program related to inland oil spill response.

In all cases, the API OSPRS and members of its technical project teams continue to work in collaboration with relevant stakeholders (including government agencies) both domestically and internationally. This collaboration includes:

- Regular briefings for agencies on JITF progress;
- Government involvement in project execution as either project team members or in an advisory capacity; and
- Government review/input on deliverables as they are completed.

API also retains close coordination with the parallel effort being undertaken by the OGP OSR JIP. There is cross representation at the governance level and a large number of technical representatives either lead or participate in corresponding projects under OGP's program. This high degree of coordination serves to identify and fill potential gaps in the combined work program, eliminate or minimize duplication of effort, and generate synergies to improve the overall result. Similar coordination is occurring with the GRN and its operational teams as well as with the Arctic JIP.

Industry believes key components to a successful oil spill response include actively engaging with stakeholders, using the most comprehensive and effective response tools, and successfully communicating response information to the public. To this end, API is developing a suite of outreach/educational materials to be housed on API's oil spill response website for use by all stakeholders involved in a response⁹. The website will also contain the various JITF deliverables described in this report. In closing, the API OSPRS looks forward to proactively working to further advance Industry's preparedness and response capabilities and to continued coordination with Federal and state agencies to achieve our common objectives.

⁹ www.oilspillinfo.org

Appendix A

OSPR Project Organization

