

Alternative Response Technology (ART) Program

Final Report

MC252 Deepwater Horizon Response

September, 2010

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ALTERNATIVE RESPONSE TECHNOLOGIES (ART) PROGRAM

This report was developed to document the ART Program for the MC252 Deepwater Horizon response. This final document captures the actions, organizational structure/changes and lessons learned of the ART Program while meeting the goal and objectives established by the Unified Command.

Introduction

The use of new and improved technologies (often referred to as Alternative Response Technologies or "ARTs") in oil spills has long been considered an important part of the response "tool box." The need for research and testing of technologies was acknowledged in the Oil Pollution Act of 1990. Some states, such as California and Alaska, took the standard further by requiring the use of "best available technology" to meet a best achievable protection standard. Early on, the Unified Command recognized that the evaluation and testing of ARTs would be a critical component of the MC252 Deepwater Horizon Response. The scale and scope of the Deepwater Horizon Oil Spill, the expectations of the public and political decision-makers, and the changing operational needs of responders required an unprecedented need for "real time" technology review, evaluation and testing and the development of an expanded approach to address these needs within the Unified Command Structure. The ART Organization was stood-up to meet these needs in late April, 2010.

At this point, it is important to distinguish between the conventional use of the term ARTs and the scope and mission of the ARTs organization created in response to the MC252 Deepwater Horizon Response. Conventionally ARTs includes all non-mechanical chemical and biological countermeasures that can be used in response to oil spills including: chemical dispersants, *in-situ* burning, shoreline cleaning agents, as well as chemical solidifiers, herders, de-emulsifiers and bioremediants. Within the first day or two following the initial oil release, technical specialists for chemical dispersants and *in-situ* burning were activated to the Incident Command Post (ICP) and specific groups were established in both the planning and operations sections to evaluate and implement the use of these technologies. As a result, the ARTs organization did not have responsibility for the chemical dispersants or on water *in-situ* burning. The ARTs organization, however, did have responsibilities for evaluation of conventional and non-conventional mechanical methods, devices and products typically not covered by ARTs including: oil sensors, booms, skimmers, decontamination and waste minimization technologies, shoreline cleaning machines and technologies as well as source control technologies.

Finally, it is important to distinguish between the conventional use of the term ART and the newer application of the NOAA-developed ARTES concept, though both could and were used sometimes interchangeably on this spill. The Alternative Response Tool Evaluation System (ARTES) was developed by the National Oceanographic and Atmospheric Administration (NOAA) to assist in assessing whether a proposed countermeasure could be a useful response tool. ARTES was developed specially to aid in evaluation non-conventional alternative countermeasures. It is designed to evaluate potential response tools on their technical merits,

rather than on economic factors. ARTES is designed to work in concert with the National Contingency Plan (NCP) Product Schedule and the Selection Guide for Oil Spill Applied Technologies.

Under ARTES, an Alternative Response Tool Team (ARTT) would rapidly evaluate a proposed response tool and provides feedback to the Unified Command in the form of a recommendation. Command could then make an informed decision on the use of the proposed tool. For purposes of clarity in this report, the group in Houma responsible for the ART evaluation will be referred to as the ARTT-group Houma, although throughout the MC252 Deepwater Horizon Response, the group was referred to as the ARTES-group Houma.

Timeline

Initially, the staffing for ART (as a technical specialist in ICP Houma) was provided by the NOAA Scientific Support Coordinator on behalf of the Federal On-Scene Coordinator (FOSC) on April 25th. The demands of vendors, operations and the media required that staffing be quickly increased, and personnel from the Coast Guard R&D Center and the State of California were activated to the Houma ICP. Concurrently, the Unified Area Command developed plans for a comprehensive ART Organization to address operational, technological and political response needs while maintaining consistency within the overall response structure.

Attachment #1 contains a timeline of the significant milestones, actions and events for the ARTs Organization.

References

Terms of References

- Initial concepts establishing the Alternative Response Technologies Organization – April/May 2010
- Initial Concepts for the High Interest Technology Team (HITT) – May 17, 2010
- Terms of Reference: Interagency Alternative Technology Assessment Program (IATAP) June 6, 2010
- Terms of Reference: Biological and Chemical Strike Team – June 23, 2010
- Houma Incident Command Operational Objectives for the ARTT Group.
- Terms of Reference ART Transition Plan – July 27, 2010

Government Guidelines

EPA

- National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300)
- National Contingency Plan (NCP) Product Schedule

NOAA

- Alternative Response Technologies Selection Guide
- Alternative Response Tool Evaluation System (ARTES)

Regional Response Team Procedures

- Region IV & VI Regional Response Team Use of Chemical and Biological countermeasures Dispersants in Region IV – Regional Response Team IV's Policy for Use of Dispersants in Ocean and Coastal Waters.
- RRT-VI FOSC Dispersant Pre-approval Guidelines and Checklist
- RRT-IV Pre-Approval for the Use of Solidifiers
- RRT-VI Pre-Approval for the Use of Solidifiers

State Permitting Requirements

- Shoreline cleanup permitting requirements
- Air Emissions Variance
- Emergency Use Authorization

Federal Permitting Requirements

- Federal Endangered Species Act – USFWS and NMFS Section 7 Consultations
- US Army Corps

Other Reference Sources

ASTM Standards

- ASTM F 2008 - 00(2006) Standard Guide for Qualitative Observations of Skimmer Performance
- ASTM F 808 Guide for Collecting Skimmer Performance Data in Uncontrolled Environments
- ASTM F 1523 Guide for Selection of Booms in Accordance with Water Body Classifications
- ASTM F2709-08 Standard Test Method for Determining Nameplate Recovery Rate of Stationary Oil Skimmer Systems
- ASTM F1780 - 97(2002) Standard Guide for Estimating Oil Spill Recovery System Effectiveness

Authority

- Houma Incident Command Authorization (NOAA SSC and USCG FOSC – day 2)
- Unified Area Command and BP Program Establishment

Operational Requirements

1. RRT IV and VI approvals and limitations:
 - Use of loose sorbent and solidifying agents
 - Bioremediation Agents (on-water, shorelines)
 - Chemical Countermeasures (shoreline cleaners)
2. National Contingency Plan (NCP) Product Schedule Listing
3. State and Federal regulatory requirements (wetlands and sediment relocation)
4. Wildlife concerns and Section 7 consultations (under the Marine Mammal Protection Act and the Endangered Species Act) for turtles, marine mammals and nesting birds

5. Any operational requirements or limitation regarding testing technologies (e.g., weather, sea state)

Objectives

1. Vet new ideas from the public and match these technology ideas with defined operational needs of the MC252 Deepwater Horizon incident to improve oil spill response or source control.
2. To provide a safe, efficient, deliberative test and evaluation of products, equipment and applications proposed for use in the spill response and to document the capabilities and limitations of these items for consideration by the Operations and/or Logistics Sections of the ICP's.
3. Ensure that all testing and evaluations are in compliance with all applicable regulations including environmental requirements and health and safety standards.
4. To keep abreast of technologies and applications emerging in the field and provide coordination and feedback for their development.
5. Communicate effectively with Unified Area Command, the ICP's and other stakeholders
 - (a) Appropriately inform submitters of the status of their suggestion(s)
 - (b) Provide technical assistance to the public information officer and liaison office regarding ARTs and assist in public and community outreach efforts.

Goals

To improve the efficiency and effectiveness of response and cleanup operations through evaluation and testing of new and improved response technologies.

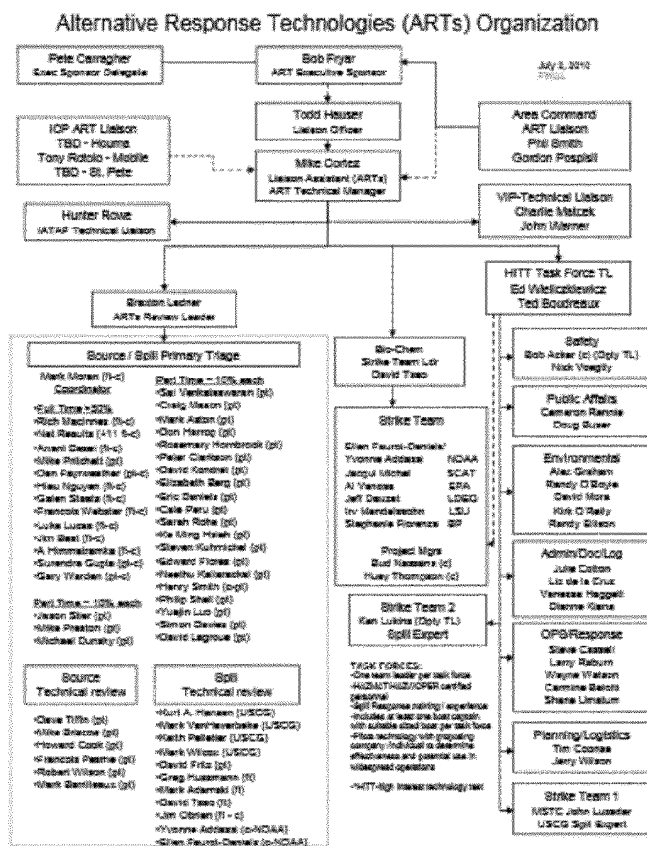
Priorities

- Establish consistent and effective process for gathering and assessing (or triaging) submissions.
- Develop process for categorizing, scoring and prioritizing submissions.
- Establish field testing teams to provide both qualitative and quantitative testing of identified technologies and provide timely feedback to meet operational needs. Ensure all testing addressed any wildlife or environmental concerns.
- Ensure that the submission and evaluation process is as transparent to submitters as possible.
- Establish Strike Teams and work groups to meet specific shoreline and long-term technology evaluation needs (such as bioremediation and sand cleaning).
- Support planning and operations with the Incident Command Posts and Unified Area Command, including public outreach, responsiveness to media, etc.
- Coordination with and support of the IATAP¹ (Interagency Alternative Technology Assessment Program). Please refer to **Attachment #3** for the IATAP terms of reference.

¹ Whereas the BP ARTs process involved BP, U.S. Coast Guard, State of California and BP-contracted personnel, the IATAP was a U.S. Coast Guard-led process (on behalf of all federal agencies). The call for proposals for the IATAP was announced June 6, 2010. Please refer to attachment #2.

ART Operational Organization

The ART organization is organized and coordinated out of the Houston Incident Command Post. It reports to the Unified Area Command in New Orleans, reporting to Robert Fryar, Executive Sponsor and Deputy Area Incident Commander. As the response evolved and the ART team responsibilities expanded and contracted, the organization evolved similarly. Early in the response the bulk of the ART personnel were focused on evaluating and progressing submissions while later in the response testing of high-graded proposals took precedence. It is important to note how quickly Team member numbers and skill sets were changed as the work load and priority evolved. While all ART Team organization charts are enclosed in **Attachment #46**, below is the organizational chart as of July 2, 2010².



Background information and sample work products for the functional units outlined in the organizational chart above are provided below.

² This organization chart represents a time of "peak staffing" for the ART Organization.

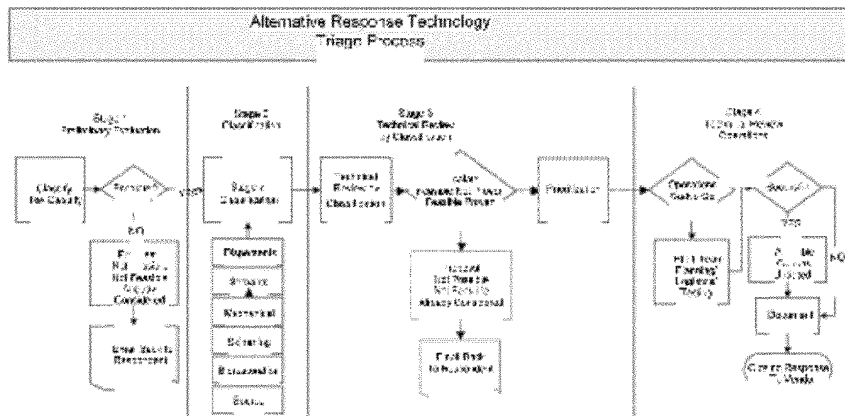
Horizon Response Center

ART Evaluation Process – Coordination in Houston

In late April, the online ART database was up and functioning and available to the general public. The web interface was designed to provide a simple mechanism for the general public and interested parties to submit ideas to the Unified Command regarding new and improved technologies to address the MC252 Deepwater Horizon spill response. **Attachments #4 and #5** are sample web site input and data capture forms, respectively.

Other web-based databases were established to address input from the public and interested parties on the use of technologies. Some of these include web-based databases established by the Louisiana Business Emergency Operations Center, the Federal Environmental Protection Agency (EPA) and the IATAP coordinated by the U.S. Coast Guard. Except for the IATAP process which remained discrete from the BP-ART's database, processes were implemented by late May and early June to integrate the information content from several discrete databases into the BP-ART database. When completed, this created a large back-log of submittals needing triaging and the organizational structure required to address this workload is the June 2 organizational chart outlined above.

The flow chart below outlines the triage process for submittals received. A more detailed diagram of the data inputs for reviews at each stage of processing can be found in **Attachment #6**.



Stage 1: Primary evaluation of the technology is conducted at this stage. Proposals are reviewed by a trained team of evaluators comprised of individuals with various backgrounds. Evaluator degrees were primarily Bachelor level, although a number were Masters and a few Doctoral. Disciplines spanned petroleum, process, mechanical and civil engineering to water and waste water management, soil science and environmental areas. If a submittal was determined to be

“not feasible”, “not possible” or “previously considered”, the submittal was not escalated to stage 2 and an email was sent to the project submitter, thanking them for their submittal.

Stage 2: This stage categorized proposals in two ways: The first categorization determined whether the proposal addressed stopping the oil release at the “source”, or subsequent oil “spill” cleanup. The second categorization further delineated the “spill” proposals into the following-categories: dispersant, chemical, sorbent, mechanical, skimming, bioremediation, or other.

Stage 3: A review by more specialized technical expert(s) was conducted at this stage. The goal of this phase was to determine which project would assist in achieving response objectives most efficiently. A scoring method was used to facilitate the prioritization of submittals. The methodology, adapted from the Carver Scoring Method,³ provides rankings based on criteria derived for each category. **Attachment #7** is an example of the Carver Scoring Sheet used to score and rank all the spill categories, except for the scoring of bioremediation and biochemical products, which can be found as **Attachment #22**. Proposals were scored and prioritized in Stage 3B for testing based on operational needs.

Stage 4: This was the holding place for projects that were formally evaluated and/or tested.

A summary of the 5 month program is provided below.

- The ART team received and evaluated nearly 123,000 individual ideas, suggestions and proposals for ending the MC252 well flow (80,000 suggestions) or cleaning up the resulting spill (43,000 suggestions)
- Approximately 470 suggestions were found by the expert reviewers to meet the criteria for possible formal evaluation & field testing. The remainder generally fell into these categories:
 - Already considered / duplicate submissions – three-quarters of all suggestions were substantially similar to ones already submitted/identified
 - Not possible – e.g., ideas not physically feasible at 5,000’ water depth, 2240 psi and 39 degree F sea floor pressure and temperature, the well’s high flow rate or several thousand psi well flowing pressure
 - Not new technology (existing product, service, equipment) – these were sent to a database to be immediately available to response personnel
 - Adverse impacts – suggestions that had undesirable side effects, e.g. hay or hair (which sinks with time), introducing new bacteria (an act not allowed by regulatory bodies)
 - Non-engineered or invalid scaling – e.g., kiddy pool demos, kitchen demos, use of garden hose as simulated well flow
 - Not a solution – comments only, frivolous ideas, complaints, etc.
- Of the 470, approximately 170 suggestions were related to bioremediation and the other 300 addressed booming, skimming, mechanical equipment, sand cleaning, etc.
- Nearly 100 suggestions were formally evaluated and/or field tested, and 25 of these have seen significant use during the current response operations.

³ CARVER stands for Criticality, Accessibility, Return (or Recuperability), Vulnerability, Effect, and Recognizability. This is a scoring and prioritization method used by the military to evaluate projects in terms of their overall importance.

- The remainder of the feasible suggestions will be addressed by the ongoing, long-term biochemical testing program, by the new Gulf Coast Restoration Organization as part of its ongoing spill response R&D program, or by BP's Drilling and Completions Technology Group for source related submissions.

Products, Services and Equipment Database

When submitters of technology came to the website www.horizonedocs.com, they were presented with the choice to submit either a new idea needing testing and verification or an "existing" technology. For the latter they were directed to the Products, Services & Equipment (PSE) database where they entered all their details and were immediately acknowledged by the Deepwater Horizon Response. The acknowledgement stated that they were now in the database and available to be seen and used by responders throughout the incident command structure.

When items were entered into the PSE database, submitters were informed that their submission implied that the products, services or equipment were commercially and immediately available – including any required, experienced implementation resources. Submitters were able to attach a file (up to 2mB) in size to substantiate their claim of effectiveness and availability.

Some offers reach the PSE database through the ART triage process. If a technical reviewer in Stage 1 or Stage 3 believed the technology was not a new one that needed further evaluation, he or she could reclassify the submittal as an existing Product, Service or Equipment. In those cases the submitter received an automated email from Deepwater Horizon Response acknowledging the move. **Attachment #8** is a sample web-site input form for the PSE database.

More specific information can be found in the following attachments:

Attachment #9: Sample email responses sent to technology submitters at different stages of the triage process.

Attachment #10: Graph documenting the number of items submitted into the database and the stage of processing over time.

ART VIP Program

As the scope of the MC252 incident widened and the number of calls to the Call Center increased, a group of submitters began to surface who required an inordinate amount of time to handle. These usually were high profile, high maintenance individuals who were either politically connected or had close ties to BP executives. Sources included:

- Federal/State/Local government officials and their vendor constituents
- BP executives or their assistants who had been contacted
- BP Government and Public Affairs who had been contacted
- Walk Up vendors to UAC and ICP's
- Irate people at the Security Desk @ Westlake
- Individuals threatening legal action

Initially these requests were handled by the existing ART's Liaison Officer and Technical Manager. By early June, as overall call center activity ramped up dramatically, a significant

backlog of VIP requests had developed prompting the creation of the VIP Technical Liaison position. At the peak of activity in late June, approximately 30 new requests per day were coming in by email, phone or letter. At that time a second person was added to the team to ensure a timely response to each VIP submitter.

The VIP team provided as much special attention as possible to these individuals while remaining within the established, transparent and equitable ARTs submission process. Activities consisted of:

- Assisting the VIP with submission
- Researching status of submission in the ART or PS&E system
- Proactively communicating with the VIP
- Conducting teleconferences/meetings in special instances
- Providing a personal point of contact for the VIP
- Building relationships

An early decision was made by the VIP team not to communicate directly with politicians themselves, but to only work directly with the vendors. This was coordinated with the BP Government and Public Affairs group who in turn would communicate with the politicians.

By early September, the volume of VIP requests dwindled to 1-2 per day. Activities then turned more to continuing the relationships that had been established and supporting the Legal team investigating those parties threatening legal action.

ARTT Group – Houma Incident Command Post

Initially, the role of ART technical specialist in ICP Houma was staffed by the NOAA Scientific Support Coordinator and an administrative assistant on behalf of the FOSC beginning April 25. Within days, the demands of vendors, operations and the media required that staffing be increased and the Houma Unified Command approved additional personnel for establishment of an ARTT-group in the Environmental Unit. Coast Guard R&D Center and the State of California personnel were initially activated to the Houma ICP as was an industry technical expert⁴. Initially, the ARTT group was tasked with supporting the technological operational and planning needs (current and future) of the Houma ICP, meeting and coordinating with vendors, testing and evaluating technology, and providing recommendations for appropriate use of technology. As the Unified Area Command began establishing an over-arching ARTs Organization (managed from the Houston ICP) in early May, the ARTT-group in Houma took on additional reporting responsibilities to Houston, while maintaining the existing reporting structure within the Environmental Unit and meeting the ART objectives established by the Unified Area Command. ARTTS maintained alignment with the overall ART organization while continuing to report to the Houma Command Post via the Environmental Unit. Additional Coast Guard personnel were assigned to ARTT-group Houma in mid-May to meet growing operational needs.

⁴ This industry representative provided technical experts to the ARTTS group in Houma for the first couple of weeks of May and was subsequently demobilized.

Beginning late April and throughout mid-July, the ARTT staff spent significant time on the database triage process, both in the initial assessment (Stage 1) and scoring and prioritization (Stage 3) for all spill categories except bioremediation/biore Restoration (scoring of bioremediation entries in Stage 3 were completed by Dr. David Tsao and Dr. Mark Adamski). ARTT staff also consistently “mined” the ARTs and PSE databases, and outside technical sources, to find technologies to meet response needs identified by the Operations Section.

Staff also provided the following functions: (not a comprehensive list)

- liaison with the Regional Response Teams, ensuring that all projects meet all approval requirements;
- development and maintenance of a “operational needs” matrix;
- liaison with Wildlife Operations, Shoreline Cleanup Assessment Team (SCAT) and appropriate trustee agencies to ensure all projects met wildlife and habitat cleanup objectives and requirements with no unintended consequences;
- coordinate and conduct quantitative testing and evaluation of technologies;
- ART technical support for Community and Parish outreach meetings and events;
- conduct vendor meetings and provide follow-up reports, as needed.
- coordinate with ART-technical liaisons established in both the Houma and Mobile ICP Operations organizations.

Additional information on projects and products coordinated and developed by the ARTT group in Houma can be found in the following attachments:

Attachment #11: RRT approval for solidifiers – May 9, 2010

Attachment #12: Proposal for Use of Organic Sorbents – Pilot Project – June 2010

Attachment #13: Sample operational needs matrix – July 2010

Attachment #14: Checklist for New Technology Proposal Review – July 2010

Attachment #15: Evaluation of Alternative Cleanup Alternatives for use with Booms – May 2010

Attachment #16: Results of Evaluation of Alternative Boom Products – June 2010

Handout Materials for Public Expos and Response Web-site

Attachment #17: Fact Sheet: Sorbents and Solidifiers – June 2010

Attachment #18: Fact Sheet: Surface Washing Agents and Bioremediants – June 2010

Attachment #19: Oil Removal in Marshes – July 2010

Attachment #20: Questions and Answers for ARTs – June 2010

Attachment #21: Outline for Plaquemines Parish President meeting – June 3, 2010

Attachment #22: Notes and Attendees for March Cleanup Techniques Meeting – June 30, 2010

Attachment #23: Example vendor meeting follow-up report – June 12, 2010 – Rigid Pipe Boom

Attachment #24: Sample ARTT – Coast Guard Situation Report – June 3, 2010

Attachment #25: Sample Daily Report & IAP Input – July 28, 2010

Attachment #26: Draft Sand Cleaning Matrix – July 27, 2010

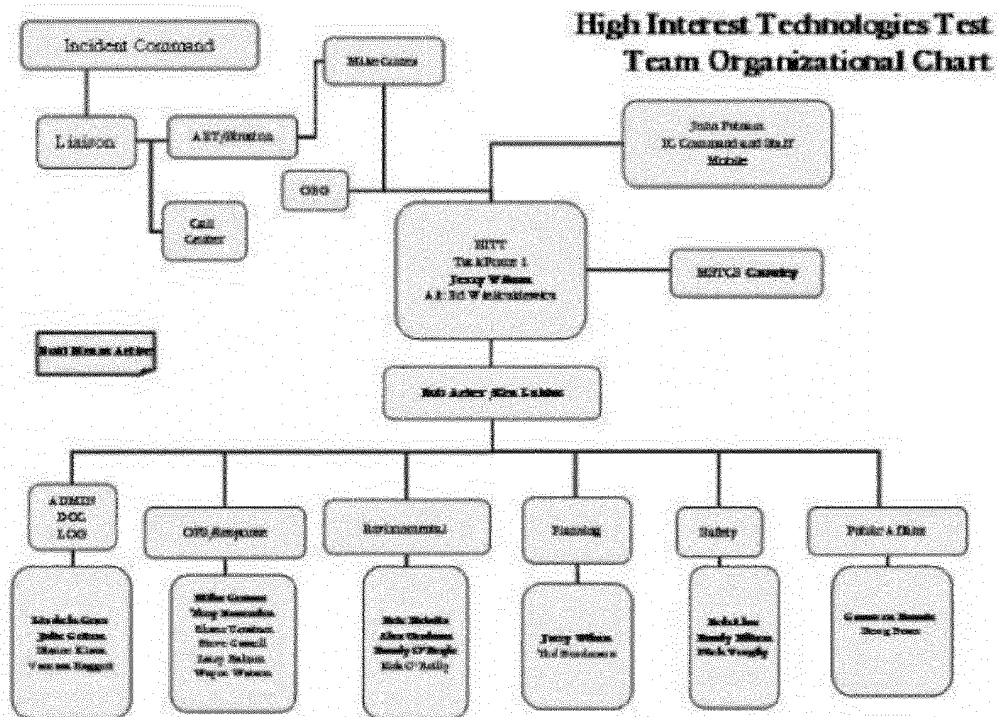
High Interest Technology Testing (HITT) Team – Field

By early May 2010, thousands of ideas were being submitted to the ART database for evaluation. After primary and secondary triage of these ideas were completed, there was a need to determine both the appropriateness and effectiveness of a submission with regard to operational needs. It was determined that Operations Section personnel did not have the ability to break away from emergency response tasks to field test the effectiveness of any particular technology.

To address this field testing and evaluation objective, a separate HITT (high interest technology test) team was established as part of the ART organization. The HITT task force team was tasked with conducting real time, qualitative field evaluations of equipment presented for recovery, containment or protection. The team did not address chemical or *in-situ* burning proposals. The final evaluation would be brief, utilizing P-50 criteria, meaning a basic understanding of successful operation and effectiveness. Evaluation would be qualitative in nature and based on direct observation of equipment testing. All evaluations were against a standard and not against another product.

Members were selected for the HITT team based on past testing and oil spill response experience and technical competencies. Care was taken to ensure that teams were well balanced with members from different agencies, industry, and the Coast Guard. A safety officer and environmental unit specialist were included on the team to ensure compliance with all human health and safety and environmental standards.

Below is the HITT Team Organizational Chart (July 19, 2010)



Additional information on projects and products coordinated and developed by the HITT team can be found in the following attachments:

- Attachment #27:** Sample HITT Report – July 18, 2010
Attachment #28: HITT Team Check List
Attachment #29: HITT Technology Evaluation Form – July 8, 2010
Attachment #30: HITT Guidelines Manual – July 26, 2010
Attachment #31: Invitation to Demonstration of Shoreline Protection Technology June 21, 2010
Attachment #32: Vendor Check-In Sheet – June 21, 2010
Attachment #33: Guidelines to Vendors – June 21, 2010
Attachment #34: Sample Tactics Template
Attachment #35: Sample HITT Project Summary – July 7, 2010
Attachment #36: HITT Critique Summary – July 26, 2010

BioChemical Strike Team (BCST)

Questions regarding the use of bioremediation agents as a primary response option, by both vendors and local officials, began hitting the Mobile, Houston and Houma Command Posts as early as late April, with increased political pressure for the evaluation and use of these products both on water and on shorelines. The use of any bioremediation product requires approval of the Regional Response Teams (RRT) and the Regional 4 RRT policy does not allow the use of bioremediation products as an on-water response tool. This policy was reaffirmed early in the MC252 Deepwater Horizon response. Almost concurrently, the HITT Team in Mobile and the ARTT-group (subsequent to a meeting with the Plaquemines Parish President, several public expos and high-level meetings coordinated by the liaison officer) each requested that a bioremediation/biore Restoration strike team be stood up within the ARTs organization to address both short and long-term needs of the response. Todd Hauser, Houston ICP Liaison Officer approved the formation of the team on June 23rd. Terms of reference for the establishment of this team is in **Attachment #37**.

Objectives for the BCST were:

- A) Make determination of which chemical and biological technologies best meet the needs of Unified Command in oil spill cleanup, and warrant testing
- B) Determine which technologies should undergo laboratory and/or field testing, with ARTs management approval
- C) Establish the testing protocols and define successful completion of objectives
- D) Summarize the results of testing, and
- E) Recommend to Unified Command the best technologies for use

The BCST has representatives from industry, federal and state trustee agencies, United States Coast Guard, U.S. EPA, and the academic sector.

Additional information on projects and products coordinated and developed by the BCST can be found in the following attachments:

- Attachment #38:** GoM Related Bioremediation Activities – July 1, 2010
- Attachment #39:** Final BioChem Score Criteria
- Attachment #40:** Remediation Product Test Protocols
- Attachment #41:** ART Database Results: Bioremediation

Current status of the BCST effort is documented in the ART Organization Status and Tasking Section below.

Unified Area and Incident Command Post Technical Liaisons (TLs)

As the roles and responsibilities of the ART Organization increased to meet the changing complexities of the response, "ART-TL" positions were developed and staffed for each of the ICPs as well as the UAC beginning June 30, 2010. These positions functioned as liaisons between the different command functions and within the ARTs organization to ensure efficient and effective communications flow. Roles and responsibilities for the ART-TLs varied between the Command Posts and with the Houma ICP, many of these duties were shared with the larger ARTT-group in Houma. General duties for each of the UAC and ICP "ART-TLs" are provided below.

General duties for UAC Technical Liaison:

- Work with ART Technical Manager and UAC to prioritize field trials
- Coordinate with USCG to consolidate ART/IATAP project inventories & potential field testing
- Create and manage overall communications framework for ART field testing activities
- Consolidate ICP ART Group success stories
- Develop strategic messages and communications channels
- Work through JIC to educate/inform wider response organization regarding activities and successes
- Support UAC leadership regarding ART
- Maintain awareness of program status & outcomes
- Respond to special requests
- Monitor overall ART implementation program for effectiveness

General Duties for Houma and Mobile Technical Liaison (Operations Section Chief or Deputy) ICP position duties as follows:

- Identify local response operations needs
- Consult with ART team in Houston to identify best solutions
- Network within ICP for endorsement of proposed solutions
- Enable ART Strike Force field trials by enlisting appropriate aid (eg Form 213 approvals) from local operations (Forward Operating Branches)
- Assure field trials respect all local prescribed work procedures, regulations, safety rules, etc.
- Assist as needed to organize and plan demo fairs and media events in local areas. Work with UAC TL to share success stories
- Regularly assess effectiveness of program and work with UAC TL on continuous improvements
- Own local ART VIP contacts, tours and other activities

Communication with Stakeholders

Developing and maintaining good communication with stakeholders, interested parties and the general public is a critical component of the ARTs organization. Focused and targeted methods were developed to ensure adequate and effective communications. Key stakeholders included:

- Proposal submitters
- Vendors
- Command Post Sections: Operations and Planning
- Unified Area Command and the National Incident Command (NIC)
- General public
- Local, state and federal elected officials
- Media

Communications were accomplished primarily through public expos and town-hall meetings, focused meeting with local and state elected officials, daily and weekly reports, staffing liaison (TL) functions in the ICPs and UAC, sponsoring and participation in vendor testing and demonstrations, and creation of public outreach materials for the web site.

Some of the key communication steps taken were:

- ART Stage 4 Summary Report (spreadsheet) and ART Technology Success Stories (slide pack) were updated weekly and shared with UAC, Houma, Houston & Mobile Command & Operations.
- Documents were stored in 3 separate share points (ART site in Houston, Houma ICP site, Mobile ICP site).
- List of ART Technology take-up and ART Summary Message documents created.
- High Interest Technology Test Team's communication blog created and updated regularly.

It is recommended that for any future spill a pro-active communications strategy with stakeholders be developed and implemented from all levels of the ART program. The ART program Technical Manager (or his delegates) should create both an internal and external communication strategy. Internal to promote success and uptake of the technologies tested external to tell submitters and the public what is being done. Any communications strategy should consider following items:

- Create a common site (sharepoint or Website) where documents can be stored and shared as needed in an organized manner such as by use of cloud computing technology or other efficient means.
- On a regular basis (weekly), capture technology items deployed in Operations and the impact made.
- Develop and implement a strategy to pro-actively communicate with key external stakeholders on technology deployed and impact made (Local, state and federal elected officials, UAC and NIC, General Public) via presentations, videos, blogs and by other means.

- Communicate by use of social media such as podcasts or blogs on new alternative response technologies tested and deployed.

Reporting and Documentation

The ART program has developed standardized reporting requirements for this response that are directed to various groups. These reporting requirements included:

Report Name	Intended Audience	Periodicity	Initiation date
ARTES Daily Report	Coast Guard Command	Daily	May 5
ARTs Weekly Report	UAC, NIC, Houma, Houston & Mobile Command	Weekly	June 10
Field Testing & Evaluation Reports	UAC, NIC, Houma, Houston & Mobile Command & Operations	Upon test completion	Early May
ART Stage 4 Summary Report	UAC, NIC, Houma, Houston & Mobile Command & Operations	Weekly	Mid-June
ART Technology Success Stories - Powerpoint	UAC, Houma, Houston & Mobile Command & Operations	Weekly	Late June
ART Operational Period Objectives	ART Team Members, UAC, Houma, Houston & Mobile Command & Operations	Weekly	Mid-July

ART Organization Status and Tasking

As the Unified Area Command began laying plans for "Phase II" following complete plugging of the MC252 well, ART examined its structure and practices to assure complete alignment with current and remaining response needs. Given this, an ART transition plan was adopted on July 27 (see **Attachment #42**) and is described in more detail in a following section below. Included in the transition plan were forecasted staffing levels and the recognition that suggestion evaluation needed to be focused and completed.

As a way of prioritizing outstanding suggestions, a long-range needs assessment of associated technology investigations was developed (refer to **Attachment #43**). It divides response evolution into six phases based on those described in the UAC Transition Plan:

- All-zone response
- Near-shore and shoreline cleanup
- Shoreline cleanup only
- Detailed cleanup to endpoint level
- Remediation & monitoring
- Long term monitoring



"Operational need" categories were created based on input from the HITT and the ARTT-group representing their respective ICPs. Categories that spanned multiple, remaining phases were

considered the highest priority. Suggestions falling into these “operational needs” categories rose to the top for evaluation during the remaining time for the ARTs program. Five 5 key areas or “themes” emerged for final ART evaluations:

- (1) in-situ sand cleaning,
- (2) debris/waste disposal,
- (3) bio-chemical remediation,
- (4) stranded oil removal from marshes/beaches and,
- (5) sidewalk/pier/dock cleaning.

A few other items were selected for evaluation (i.e., submerged and/or buried oil detection) which had the potential to leave the overall oil spill response capabilities at a higher level. Again, these “themes” were based primarily on operational needs identified by the ICPs for the duration of the spill response.

The remaining 400+ Stage 3B ART technologies were examined with respect to these five focus areas. 41 technology submittals spanning these focus areas which were most likely to have a material, scalable, timely impact on the current and any future significant spill were recommended for a desktop examination or field trial. Bioremediation investigations would be in addition to these 41, and are discussed separately below. The 41 were then integrated with projects recommended by the IATAP group and others identified through evolving operational needs and resulted in a final total of 45. A small number of items targeted to improve future response technology were included. All remaining spill related submissions in other “theme” areas would not be tested (submitters were notified appropriately) since they did not meet remaining operational needs and will be turned over to the GCRO for ultimate disposition.

ART/IATAP project integration and selection meetings have commenced, facilitated by UAC, and are aimed at advancing the best projects and those most aligned with response objectives.

The ARTs organization will continue to have formalized operations via the ART-TLs in both Houma and Mobile, as these ART-TLs in the ICPs have helped assure integration of key field testing activities (procurement, financial authority, operating standards) with those of the wider response organization.

Having evaluated and ranked the most promising of over 100 high-graded BioChem proposals to ART the BCST has moved to the testing phase. Testing protocols have been developed for the high-graded 30 products. 6 products (4 bioremediation and 2 surface washing agents) will be tested in the field/marsh, 8 products (5 bioremediation and 3 SWAs) will be laboratory tested while the remaining 16 products (7 SWAs and 9 dissolved oxygen/aerators) will be desk top evaluated. A complete list of the products evaluated is available in Attachment #41. The assessments of the 30 selected products will be completed as the BCST transitions to the GCRO as part of the Science and Technology organization.

Attachment #44: ART Weekly Report – July 30, 2010

Attachment #45: ART Operational Period Objectives – July 30, 2010 for week beginning Aug 2, 2010

Attachment #46: ART Organization Chart Portfolio

Attachment #47: ART Success Stories – Final Version
Attachment #48: Revised Field Test Approval Form – July 29, 2010
Attachment #49: Summary ART Stage 4 – Final Version

Houston 45 Resolution and Status

On August 3rd the Triage/Technical teams finalized a Stage 3B Prioritization spreadsheet that outlined 41 items (of the 337 total Stage 3B items) that the HITT team should evaluate for testing based on the operational needs and themes assessment. The remaining 296 items will be forwarded to the Gulf Coast Restoration Organization (GCRO) for future evaluation and/or testing at a later date. Organizationally, the HITT team in Gulfport, Mississippi was combined with the ARTT-group to work as one HITT team.

The HITT team reviewed the 41 identified items to determine if they could be actually field tested in a 6 week time frame and if they could not, then the items were “desktop” evaluated. The high level test/evaluation project schedule is included as **Attachment #50**. The evaluations were categorized in the following operational themes and a theme testing leader assigned for execution:

Sand Cleaning (In-situ & Ex-situ)	Submerged Oil Plume Detection	Marsh Shallow Water Skimming
Boom Cleaning/Reclamation	Buried Oil Detection	SCAT - Stranded Oil Removal Marshes/Beaches
Non Boom Debris/Waste Disposal		

Of the 41 items evaluated, 26 items were desktop evaluated due to several reasons. The reasons were that the ideas were either concepts, the equipment was not built and would take 2-3 months to fabricate, or cost or logistics were prohibitive. During the planning phase the program execution 4 additional tests of opportunity we identified and combined with the original 41 creating a final total 45. See **Attachment #51** for the 45 item identification and tracking spreadsheet.

As of September 14th, the HITT team has completed 14 of 19 actual field tests with the remaining 5 field tests to occur in early to mid-October due to equipment availability. The final number of field tests or desktop evaluations completed is 31.

While completing the 45 evaluations, the HITT/ARTT team demobilized from a team of 27-30 people to a small team of 5. Most of the team members worked on a rotational basis (2 weeks on and 2 weeks off). The ARTT-group, which consisted of mostly US Coast Guard personnel, was demobilized by September 3rd. See **Attachment #52** for the combined testing and personnel schedule.

ART Program Lessons Learned

Though both the conventional use of the term ART and the newer application of the NOAA-developed ARTES concept were used interchangeably on this spill, these “lessons learned” apply to the ART Program described above as established for the MC252 Deepwater Horizon Response. Based on the context previously described, key recommendations are listed below by area of impact. The complete list of “lessons learned” are included in the excel spreadsheet embedded at the end of this list which can be sorted based on described categories.

ART team structure, leadership and ICP connectivity

- For a significant spill, an Alternative Response Technology (ART) Team under the direction of a Technical Manager reporting to an Executive Sponsor in Unified Area Command (UAC) should be a requirement of the Incident Command System (ICS) structure
- Each Incident Command Post (ICP) should establish a Deputy Operations Section Chief (or Branch Director) to lead local ART evaluations and take-up. All ART ideas should be endorsed by this person
- A single High Interest Technology Test (HITT) Team Leader should establish HITT Team(s) in ICP(s) as necessary for testing purposes only
- Establish at least one Planning, one Project Manager, one experienced responder, one responding agency (i.e., USCG, NOAA, OSPR) and one VIP positions reporting to the ART Technical Manager to address long term issues, coordinate planning/scheduling of evaluations, expand team skill set and to handle vendors/friends of various government (federal, state and local) representatives and Responsible Party leadership
- Formalize UAC & ICP ARTs coordination positions (non test team roles) immediately upon spill response initiation

Process for identifying/receiving new technologies

- A single ART database should be established to hold all submissions. Entries into the database should be made via an internet submission system giving the public a way to submit ideas as an avenue for helping address incident issues
- A submission format and minimum required information level should be established - use a standardized document submission form, no attachments or require attachments in a prescribed format, submission/idea must be made available for testing at submitters expense, state up front that ideas will be accepted without any payment, make public aware so IP issues are addressed upon initial submission and indicate that submissions should be implementable within the incident response time frame
- The database should have a moderately sophisticated “search” engine such that individual and similar records/suggestions can retrieved/viewed easily

Use established, available tools – NRP, etc.

- Begin with documented ART Evaluation System (ARTES) process at <http://response.restoration.noaa.gov>
- Practice bias to use already created tools – from USCG, NOAA, etc.

- Train all ART members in ICS principles and established procedures
- Use a standard, documented method for field test planning and reporting (attach enhanced Test team project template)

Review, vetting, scoring & scheduling process

- A 4 Stage review and testing process (see attached diagram) should be established by the ART Technical Manager
- Develop and institute a scoring system that is suitable for submittal ranking and that properly weights the ability to test and “fit” with current spill recovery operational needs
- Stage 2/3/3A review and scoring should be completed by ART Team members separated from testing responsibilities
- Stage 2 reviewers should be established by Stage categories (i.e., Sorbents, Mechanical, Bioremediation, etc.) based on area of expertise. These individuals should remain points of contact who monitor/track submissions in those categories from the start of the ART process through final disposition/evaluation
- The review process should include a communication mechanism that informs submitters via letters from the ART's Technical Manager when their submission moves from Stage to Stage or is reclassified as a Product, Service or Equipment
- Writing of test protocols should be the responsibility of the Stage 3/3A submission review team members
- Schedule idea testing in a way that anticipates changing operational need (make allowances for time required to test, then deploy, to aid current incident)

Assuring communication with and take-up by Operations

- Establish a way to drive ICP Ops Section take-up of tested, proven/recommended technologies
- Communicate back to ICP Ops and Logistics by multiple methods including written, verbal, face to face, etc.
- Establish tracking tool for Ops take-up of new technologies; include in operation period planning and reporting

External communications

- Establish and implement an external, pro-active communication strategy as quickly as possible – establish and update speaker notes that ART's Leadership, Test Team members and UAC/ICP Leadership/Public & Government Affairs individuals can use to promote success of ART process
- Use standard template for reporting on successful new technologies
- Make liberal use of anecdotal success in communications within and outside the response organization
- Communicate externally as early as possible – provide suggestion submitters/vendors confidence that their ideas are being used

Validity of Product, Services and Equipment (PSE) claims by vendors

- Include ability for owners of established technologies to offer those for use
- Include in PSE submittal information the evidence from vendor that their technology is proven – where used, results, etc.
- Periodically review PSE submittals for items of interest in an effort to match current operational needs



The following comments and recommendations are specific to establishing a field based ART Test Team.

Team Setup

- 1.) Assign one vehicle equipped with a GPS device and an emergency medical kit per every 2 team members
- 2.) Provide one credit card to Team Leader for purchasing required/emergency equipment a minimum of \$20K financial authority
- 3.) 1 Satellite Personal Locator Tracker (SPOT) for each field team
- 4.) 1 team cell phone per team – all team members should forward personal cell to team cell to minimize the chance of their personal cell being used and compromised
- 5.) Team equipment should also include a digital camera, flip video camera and a tape recorder
- 6.) Personnel rotations should be a minimum of two weeks but preferably four weeks (initial rotation should be a minimum of 3 weeks) and set such that team relief/handover occurs via face to face communication. When possible accommodate the volunteer responders, but send guidance on their expected duties early.
- 7.) Establish a team email account and a share point (for file sharing) as quickly as possible
- 8.) Safety training requirements should be established at outset of incident and should include a minimum of ICS 100-300, HAZWOPER 40 hour, Coastal/Inland oil spill response and basic media training
- 9.) Each team should have a media coordinator from the outset
- 10.) Use Alaska Clean Seas Tactic Template (Attachment #34 – Sample Tactics Template) tailored as needed for response environment operations
- 10.) Use Field Test Approval Form (Attachment #48)
- 11.) Use Enhanced Test Team project template (insert)
- 12.) Expect to spend 1- 2 days in orientation the first time a member shows up for the team
- 13.) Minimum requirements for setting up an office should include: wireless printer w/ extra toner, label maker w/ extra label cartridge, blue tape, white boards, small file cabinets; hard drive for computer back-up, general office supplies
- 14.) Hotel should have meeting room space for use as field office. Set up a room block and catering based on # of team members
- 15.) Assign an Executive Assistant to the team

ART Test Team Member Setup

1.) Equipment needs –

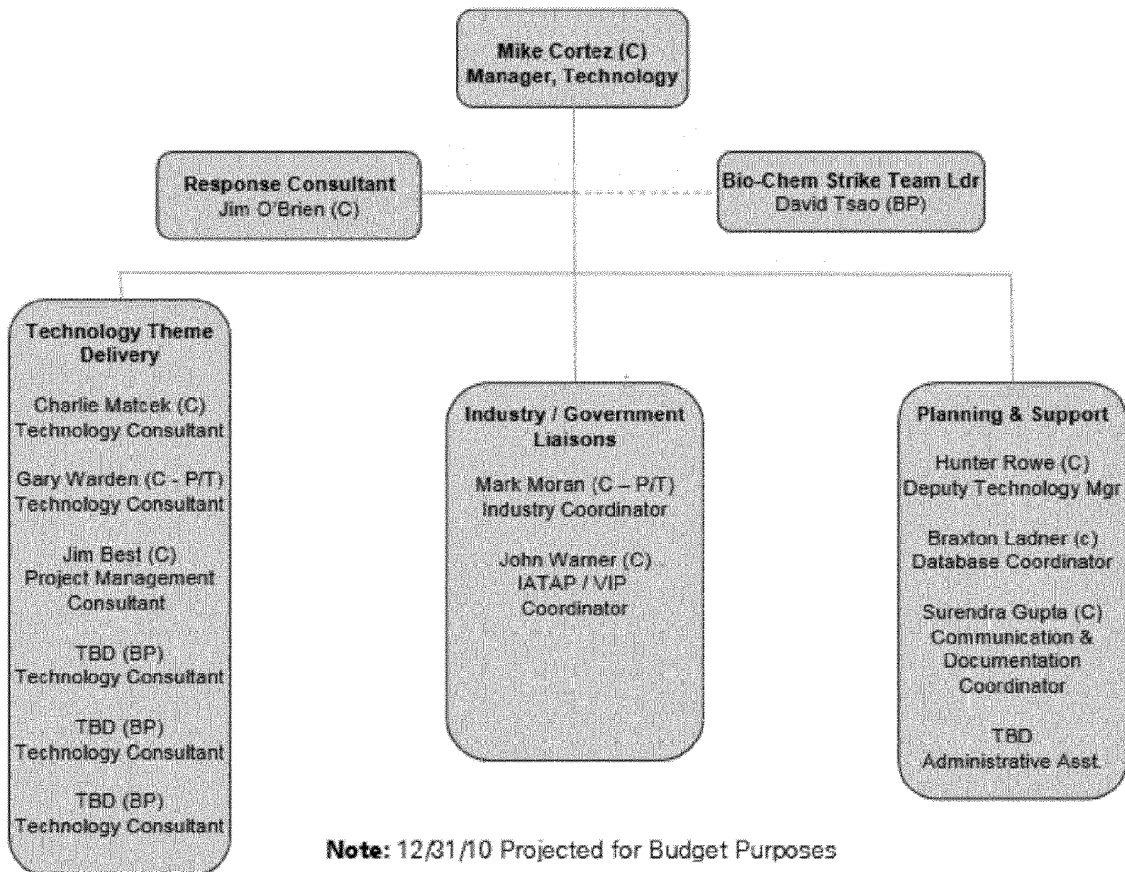
- (a) One laptop computer equipped with wireless card, spare monitor, camera and microphone [for Skype type communication set up] per person
- (b) A standardized cell phone with GPS capability. The GPS system should always be activated
- (c) Personal Protective Equipment (PPE) base kit for each team member
- (d) An Incident Command Post phone list, GPS location of base (hotel) and staging locations updated and checked on a weekly basis
- (e) Each Team Member should receive training on the communication equipment being used
- (f) Provide each new individual coming onto the team - phone list, email address/account, ART & ICP org charts, booklets for spill, map of area, list of equipment staging areas, GPS and phone number for staging locations, and download standard phone numbers to a positional phone

2.) Each member should bring their own hard toed boots

3.) PPE clothing for the team members should be location specific – expect to outfit the members with clothing suitable for the local weather – also to minimize the need to replace personal items in the event they are damaged or contaminated. Standard safety equipment should include hardhat, goggles, reflective vest, flashlight, pocketknife, and leather gloves.

ART – GCRO Transition

As stated above, an ART transition plan was adopted on July 27, approximately two weeks after the last flow from the well (see **Attachment #42**). As the Unified Area Command was laying plans for “Phase II” following complete plugging of the MC252 well, ART examined its structure and practices to assure complete alignment with current and emerging response needs. The transition plan anticipated migration of the ART team into the new Gulf Coast Restoration Organization (GCRO) in mid September, including the Bio-Chemical Strike Team and some aspects of the ARTT-Houma group and HITT. The transition occurred on September 20 and ART became the new Remediation Technology team within the Science and Technology arm of GCRO (see Organizational Chart below), with Mike Cortez as the Manager reporting to Director Laura Folse.



The agreed GCRO roles for the Technology Group are to:

- Provide advice as requested to teams involved in restoration efforts in the Gulf Coast.
- Document response work and knowledge gained and provide to GCR for onward deployment.
 - Management of ARTs process Successful tests and deployment of remediation technologies
 - Unsuccessful tests
 - Transition Source records to D&C
- Provide advice as requested by GCR to internal & external groups to upgrade response plans and regulations in light of MC252 learnings from technology assessment, testing and deployment.
- Develop research and development program for oil-spill technologies by:
 - Reviewing and prioritizing all input received during ARTs process
 - Assessing current state of oil remediation technology for all environments, prioritized against BP's portfolio
 - Engagement of key stakeholders in GCRO and SPU's
 - Implementing and managing the program using a stage-gate process, engaging stakeholders, and communicating internally and externally as appropriate.

ART – GCRO Management of Change (MoC) September 2010

To facilitate a smooth transition the ART team developed a Management of Change (MoC) document which is included as **Attachment #53**. The MoC includes both normal tasks required for stand-down of the ART team and tasks associated with transition/continuity to the new GCRO responsibilities.

List of Attachments

Attachment 1	Timeline of significant events
Attachment 2	IATAP Press Release – June 6, 2010
Attachment 3	IATAP Terms of Reference – June 6, 2010
Attachment 4	ART Web-site information – June 2010
Attachment 5	Web-site: On-Line Input Form – June 2010
Attachment 6	Proposal Review Process and Data Capture – June 2010
Attachment 7	Carver Scoring Sheet – June/July 2010
Attachment 8	Product Services and Equipment Web-Site Input Form – June 2010
Attachment 9	E-mail response triage letters send to submitters – May 2010
Attachment 10	Graph: Database items submitted and stage of processing versus time April – July 2010
Attachment 11	RRT approval for solidifiers – May 9, 2010..
Attachment 12	Proposal for Use of Organic Sorbents – Pilot Project – June 2010
Attachment 13	Sample operational needs matrix - July 2010
Attachment 14	Checklist for New Technology Proposal Review – June/July 2010
Attachment 15	Evaluation of Alternative Cleanup Alternatives for use with Booms – May 2010
Attachment 16	Results of Evaluation of Alternative Boom Products – June 2010
Attachments 17 – 20:	Handout Materials for Public Expos and Response Web-site
Attachment 17	Fact Sheet: Sorbent and Solidifiers – June 2010
Attachment 18	Fact Sheet: Surface Washing Agents and Bioremediants – June 2010
Attachment 19	Oil Removal in Marshes – July 2010
Attachment 20	Questions and Answers for ARTs – June 2010
Attachment 21	Outline for Plaquemines Parish President meeting – June 3, 2010
Attachment 22	Notes and Attendees for Marsh Cleanup Techniques Meeting – June 30, 2010
Attachment 23	Example vendor meeting follow-up report – June 12, 2010 – Rigid Pipe Boom
Attachment 24	Sample ARTT - Coast Guard Situation Report – June 3, 2010
Attachment 25	Sample ARTT Daily Report & IAP Input – July 28, 2010
Attachment 26	Draft Sand Cleaning Matrix – July 27, 2010
Attachment 27	Sample HITT Report – July 18, 2020
Attachment 28	HITT Team Check list – June 2010
Attachment 29	HITT Technology Evaluation Form – July 8, 2010
Attachment 30	HITT Guidelines Manual – July 26, 2010
Attachment 31	Invitation to Demonstration of Shoreline Protection Technology – June 21, 2010
Attachment 32	Vendor Check-In Sheet – June 21, 2010
Attachment 33	Guidelines to Vendors – June 21, 2010
Attachment 34	Sample Tactics Template – July 2010
Attachment 35	Sample HITT Project Summary – July 7, 2010
Attachment 36	HITT Critique Summary – July 26, 2010

Attachment 37	BioChemical Strike Team Terms of Reference – June 23, 2010
Attachment 38	GoM Related Bioremediation Activities – July 1, 2010
Attachment 39	Final BioChem Score Criteria – July 2010
Attachment 40	Remediation Product Test Protocols – July 2010
Attachment 41	ART Database Results: Bioremediation
Attachment 42	ART Transition Plan – July 27, 2010
Attachment 43	Operational Needs Matrix – July 30, 2010
Attachment 44	ART Weekly Report – July 30, 2010
Attachment 45	ART Operational Period Objectives – July 30 2010
Attachment 46	ART Organization Chart Portfolio
Attachment 47	ART Success Stories – UAC – Final Version
Attachment 48	Revised Test Approval Form – July 29, 2010
Attachment 49	ART Stage 4 Summary - Final Version
Attachment 50	High Level HITT Field Test Schedule
Attachment 51	Houston 45 Project Tracking Spreadsheet
Attachment 52	Combined HITT Personnel & Field Test Schedule
Attachment 53	ART – GCRO Management of Change (MoC) Document

Attachment 1: Operational Timeline

- April 20: MC252 Deepwater Horizon (DWH) platform explodes killing 11.
- April 22: NOAA Scientific Support Coordinator and FOSC asked for the standing up of an ARTT-group in Houma.
- April 25: Staff from United States Coast Guard R&D Center put on stand-by for deployment and began working remotely on ART issues
- April 27: National Oceanic and Atmospheric Administration (NOAA) put ART Technical Specialists from State of California on stand-by.
- April 27: First phone calls being answered in the Houston Call Center.
- April 30: Began collecting suggestions in a database developed and managed by Operations Excellence Group (OEG)
- May 1: Staff from United States Coast Guard Research and Development Center (R&D) arrived at the Houma Command Post to work on ART issues
- Early May: Monday, Wednesday, Friday 10 am ART conference calls established as well as Monday, Wednesday, Friday 1 pm Triage Review conference calls
- May 10: ARTT-group Houma began work on development of test protocols for testing alternative booms (sorbent and solidifier)
- May 12: Staff from California Department of Fish and Game, Office of Spill Prevention and Response (on behalf of NOAA) arrives at the Houma Command Post to work on ART issues.
- May 16: Region VI Regional Response Team gave permission for the use of chemical solidifiers in contained form.
- May 20: Establishment of the High Interest Technology Testing (HITT) Task Force Team in Houston
- May 21: Mr. Michael Cortez takes responsibility for leading the ART team, May 21 supported by Braxton Ladner of OEG
- May 25: Field testing of sorbent boom testing by ARTT-group Houma.
- May 28: Permission given to fully staff the HITT Team for field deployment

- May 31: HITT Team witnesses first demonstration by Clean Beach Technologies at their facility in Houston and begins move to Mobile.
- June 1: HITT Team coordinates with Mobile Operations Section to develop new applications of current equipment to help increase response effectiveness. Operational needs begin to drive projects that the HITT Team focuses on.
- June 3: Commence Primary Triage team teleconferences 2/week to process the rapidly increasing number of technology submittals entering the database
- June 4: IATAP announcement
- June 5: A consolidation of the databases suggestion from several other sources into the BP-ARTs database significantly increases the backlog of ideas for triage and evaluation.
- June 8-9: ART in Houston expands focus to take on VIP and IATAP liaison roles.
- June 9: First of numerous Public Expos by vendors began in Louisiana⁵. Plaquemines Parish. Large work-load for ARTT-group Houma (initially, expos were scheduled 3-4/week, but by mid-July, this curtailed to 2/week).
- Mid-June: Peak backlog of submitted items. Significant staffing increases to staff the ARTs Houston triage team (added ~15 more full time people)
- June 21: First HITT Team public vendor display in Gulf Shores, AL. HITT coordinated vendor event to demonstrate and evaluate shoreline protection technology
- June 23: Gulf Coast Restoration Organization (GCRO) announced
- June 23: Biological and Chemical Technology (BCST) Strike Team approved
- June 24: ART review with Doug Suttles & UAC leadership team; resultant direction was "always be testing something; technologies need to support the Operations, be available today, and scale-able"
- June 28: Tropical storm Alex shuts down off-shore operations.
- June 29: HITT began publishing results of several small-scale tests completed.
- June 30: ART-TL ICP Liaison roles established in Houma, Mobile and the Unified Area Command

| ⁵ By July 30, 2010, approximately 20 Public Expos were held in Louisiana.

- July 3: US Coast Guard performs tests operation of the A-Whale, a tanker sized skimmer. The ART team had previously performed an initial review and report to the UAC on the A-Whale and recommended that it not be used.
- July 4: ARTTS-group began working with Vessels of Opportunity to explore ART options for oil collection.
- July 4: Video of HITT team activities posted to BP-TV website.
- July 15: Well is capped and shut in, ART focus shift to evaluation of only "spill" items ("source" items still catalogued in database but not aggressively advanced)
- July 17: Coordination meeting with ARTTs-group Houma and the HITT team to ensure consistency.
- July 18: ARTTS-group participated in presentation of ARTs to the International Observer Program.
- July 19: ARTTS-group coordination with the Louisiana Governor's office regarding implementation of a WEBEOC to track progress of ARTs.
- July 23: ARTTS-group meets with UAC representatives regarding the Shoreline Cleanup transition plan and the roles and responsibilities of the ARTs Organization in support of the Shoreline core groups and the establishment of technical work groups.
- July 24: Ms. Yvonne Addassi, ARTTS-group, tasked by the Environmental Unit Leader and NOAA Scientific Support Coordinator to develop an ART Interim Plan Report. Preliminary due date 30 days and agreed scope to cover operations through July 31, 2010
- July 25: ARTTS-group designated the point of contact for sand cleaning technology, response wide. Mr. Jim Best joins the HITT to assist in coordination and testing to maintain consistency through the transition to the GCRO.
- July 27: ART Transition Plan – outlining the transition to GCRO over the next 6 weeks, is drafted, submitted to UAC and approved by Bob Fryar Executive Sponsor; Plan recommends HITT move from Mobile ICP to Houma ICP, and locates at Gulfport, Miss; Plan contains a list of 41 remaining field tests to be conducted prior to transition into GCRO.
- August 3: ART adoption of the list of 41 projects to evaluate/test before transition to GCRO
- August 3: Sand beach cleaning demonstration of 6 vendors' technologies is conducted at Eglin AFB at Fort Walton Beach, Florida; report completed August 11

August 3: ARTs tags at UAC stand down consistent with transition

August 5: Macondo well is plugged with cement through a top kill well procedure through the cap

August 6: ART Transition Plan reviewed with David Rainey, new GCRO Sr VP of Science & Technology, Environmental, and Regulatory Affairs; plan is endorsed with the caveat that "all 41 remaining field tests be completed prior to GCRO transition-no leftovers";

August 13: HITT team begins de-mobilization of personnel consistent with transition plan

August 15: ARTs database surpasses 120,000 technology submissions; a total of 100+ field tests will have been conducted by early September

August 24: ART transition plan is reviewed with Laura Folse, GCRO Director of Science & Technology; ART team will transition in under her direction as of September 20th

August 27 BioChem Strike begins laboratory and field testing of highest priority bioremediation products submitted for evaluation

September 3: Houma & Mobile ICP ART tags stand down as ICP's begin transition

September 18: Macondo well bottom kill operation is completed, which is trigger point for moving the Response into Level II.

September 20: Houma & Mobile ICP's collapse down into the new GC IMT located in NOLA; Galveston & Miami ICPs shut down.

September 20: ART team transitions into the GCRO Science & Technology team; 42/45 field tests completed

October 15: Targeted date for completion of the final three field tests