

**The Deep Water Horizon MC252-Macondo Shoreline Cleanup Assessment
Technique (SCAT) Program**

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ABSTRACT

The Shoreline Cleanup Assessment Technique (SCAT) program for the response to the Deep Water Horizon MC252 incident in April 2010 in the Gulf of Mexico addressed two key challenges: the scale of the affected area and the long response duration with potential for reoiling before well capping was achieved and then final cleanup being carried out in progressive stages. The affected coastline stretched between Galveston, TX and Franklin County, FL. The SCAT program started in April 2010 and will not be completed until some time after April 2011. Unified Area Command established two Incident Command Posts (ICPs) and the SCAT program was managed consistently across all States, from these two locations: Houma, LA and Mobile, AL.

The first approximately 100 days were characterized by continual spillage and the oiling and potential reoiling of shorelines, until the release was controlled. During this period, referred to as Stage II, the SCAT field teams focused on an initial assessment of the scale of the problem, followed by surveys driven by reoiling events. Shoreline cleanup operations in Stage II for the initial cleaning of bulk oil were implemented for designated, individual shoreline segments using Shoreline Treatment Recommendation (STR) forms. For segments where there was No Oil Observed (NOO) or where no treatment was recommended at that stage: a No Further Treatment (NFT) condition was recorded on Shoreline Inspection Report (SIR) forms. A key innovation during this early period was the creation of SCAT-Operations Liaison teams at both ICPs, to communicate and coordinate the treatment recommendations with the numerous Operations Branches spread across the full geographic area of response. This close engagement continued throughout all subsequent stages of shoreline response.

Following the well control, when the threat of reoiling substantially reduced, the final stage of cleaning ‘Stage III’ could begin. This was carried out in several phases to achieve clearly defined goals of cleaning, protection, monitoring, resurvey and further cleaning as necessary. Stage III commenced with an area-wide re-survey (Stage III.1) in Fall 2010. Treatment recommendations were then generated to reduce oiling levels to lowest practical levels based primarily on Net Environmental Benefit principles. When these levels were achieved the next phase (Stage III.2) involved “monitoring and maintenance” to assess natural attenuation of any oil residues within individual segments. A Spring 2011 SCAT survey (Stage 4) is generating further STRs for further treatment where deemed necessary, for remaining oiled shorelines to achieve agreed Stage 4 No

Further Treatment (NFT) guidelines. The final step involves inspection by the Unified Command SCAT teams with the land owner/manager and/or resource trustee/manager for each shoreline segment to confirm sufficient treatment has been completed.

INTRODUCTION

The shoreline response was conducted over a very wide geographic area, encompassing five states in the United States from Galveston, TX to Franklin County, FL. A variety of mainland coastline was affected, ranging from sandy shores and marshes to the occasional peat/mud outcrops, man-made and rip-rap areas. Additional features were the presence of barrier islands from Louisiana to Alabama and the remote Mississippi birdsfoot delta. A broad range of stakeholders were potentially affected and needed to be closely involved in understanding the situation and deciding what needed to be done to protect resources and clean up the oil. This paper provides a clear overview of the way these issues were successfully addressed through the SCAT program.

The SCAT process is a well established and internationally recognized approach to dealing with these issues. The objective of SCAT is to determine shoreline cleanup operations that will accelerate the removal and natural weathering of stranded oil so that the ecosystem and public usage can return to pre-spill conditions as soon as possible using practices that are best for the environment.

The SCAT mission involved:

- The systematic documentation of shoreline oiling through time
- Expert assessment of the potential fate and effects of the stranded oil
- Development of treatment recommendations and technical advice

- Identification of ecological and cultural resource constraints
- Provision of support to Operations during treatment implementation
- Creation of a unified and consensus approach from start to finish
- Provision of ongoing data on response progress

ORGANIZATION AND MANAGEMENT

The SCAT program structure was very detailed, reflecting an organization working across several States, two Command Posts, and many Operations Branch locations, but in essence the key functions are shown in Figure 1.

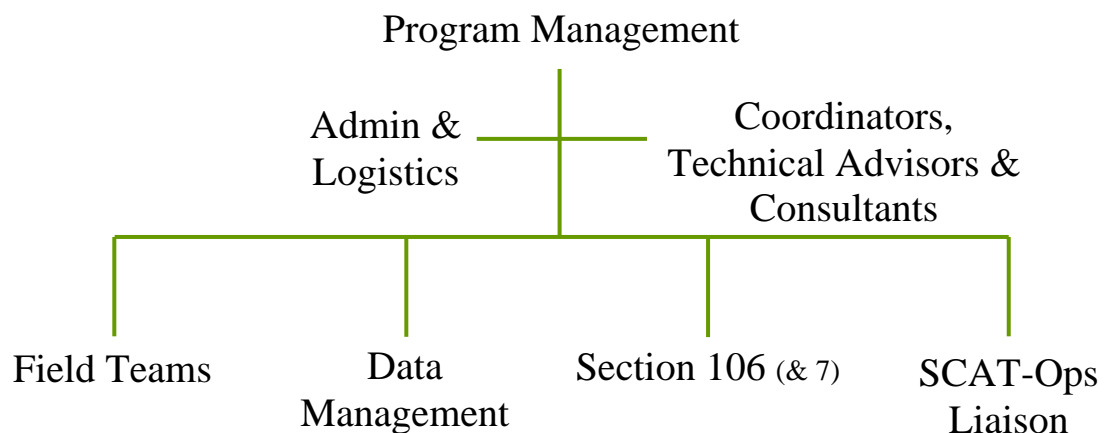


Figure 1 - SCAT Program structure

Program Management and Leadership

- Function: Provided the single point of contact (SPOC) for Unified Area Command on shoreline-related issues. Program Managers directed SCAT operations across all shoreline areas, ensuring full stakeholder engagement, contingencies for unexpected or rapidly changing situations, and directly addressing public and stakeholder concerns. In addition, they ensured accurate

SCAT information was communicated on all shoreline response issues to the ICPs.

Team composition: Three Managers from the Responsible Party worked on rotation, subsequently replaced by a full-time single Manager for the final stages of shoreline response.

Coordinators, Technical Advisors, and Consultants

- Function:
 - Coordinator - the provision of day-to-day management of activities at each ICP.
 - Technical Advisors/Consultants - the provision of expert technical advice and guidance to the program.
 - The Coordinators and Technical Advisors/Consultants were at the very heart of the program, providing technical reference, interpretation and support, ensuring the stakeholders had sound perspective for their considerations, and offering expert counsel based on many years' experience to help drive the program successfully. Team composition comprised mainly U.S.- nationally recognized experts from Responsible Party Contractor sources and NOAA, supplemented by international consultants engaged by the Responsible Party.

Working together, the Program Managers, Coordinators, Technical Advisors and embedded senior State Representatives in each ICP, provided the unified leadership of the SCAT program. The Program managers reported directly to the Unified Area Command. The Coordinators reported directly to the Environment Unit at each ICP and coordinated activities with the ICP Planning and Operations Sections.

Field Teams

- Function: Undertake ground surveys based on interagency teams to locate and document shoreline oiling. team composition included:
 - The SCAT Team Lead - an experienced technical expert who represented the Responsible Party
 - A Federal Representative: typically NOAA, a NOAA contractor or U.S. Coast Guard
 - A State Representative (LDEQ, MDEQ, FDEP, ADEM)
 - Occasionally additional representatives attended the field surveys for specific areas, including State spill response staff and other concerned parties such as National Park Service, Fish and Wildlife Service, landowners, etc.

Data Management

- Function: The management of an integrated SCAT database linked to a GIS platform, consistently applied across both ICPs, used to hold records and generate maps, reports and consolidated reference data for incident command. Team composition included NOAA, NOAA contractors, and Responsible Party contractors.

Cultural Resource Advisors (Section 106)

- Function: The management of historic properties and cultural resource information, identification of sites of importance, advice to the SCAT program in regard potential impacts and protection measures, monitoring of Operations during treatment to assure compliance with specified protection measures and best

management practices, and reporting to Federally-delegated representatives.

SCAT-Operations Liaison

- Function: Field-based coordination directly with Operations to ensure cleanup instructions were understood, implemented well and the intended results achieved. They provided as required, advice and support in equipment selection and operation, training and organization of workforce, liaison with U.S. Coast Guard observers and local stakeholder representatives, and reported progress to the SCAT program leadership. Team composition comprised Responsible Party contractors from both U.S. and international sources.

Logistics and Administration

- Function:
 - Logistics - the provision of all logistics support to field teams working across several US States in often remote site locations and offshore islands, and their coordination with other incident command field activity.
 - Administration - support the day-to-day functioning of over 200 people working rotational periods. T team composition comprised locally hired staff.

At times the SCAT program exceeded a staff of more than 250 people, not counting Federal and State representatives on the 15-18 field teams deployed, on a continuous basis for up to 12 months.

PHASES OF SHORELINE CLEANUP

A key feature of the oil spill incident was the time during which shoreline oiling could continue to occur. After the initial release, further instances of oil coming ashore could potentially arise for as long as the well was not capped -despite the phenomenal efforts at sea variously to burn, recover, or disperse the floating oil from coming ashore. Careful consideration was needed on the degree to which any shoreline was cleaned during this first period, incase further oiling occurred and repeat cleaning was required, before a steady state condition was reached and final cleaning could commence. A phased approach was adopted to ensure the most appropriate level of cleaning was agreed for each area of shoreline before the well was capped, and then afterwards when steady state conditions were confirmed. Given the geographic scope and the range of issues associated with the shorelines affected which required close engagement with all stakeholders; a step-wise phased approach was also taken during the final stage of cleaning itself. This is illustrated in Figure 2.

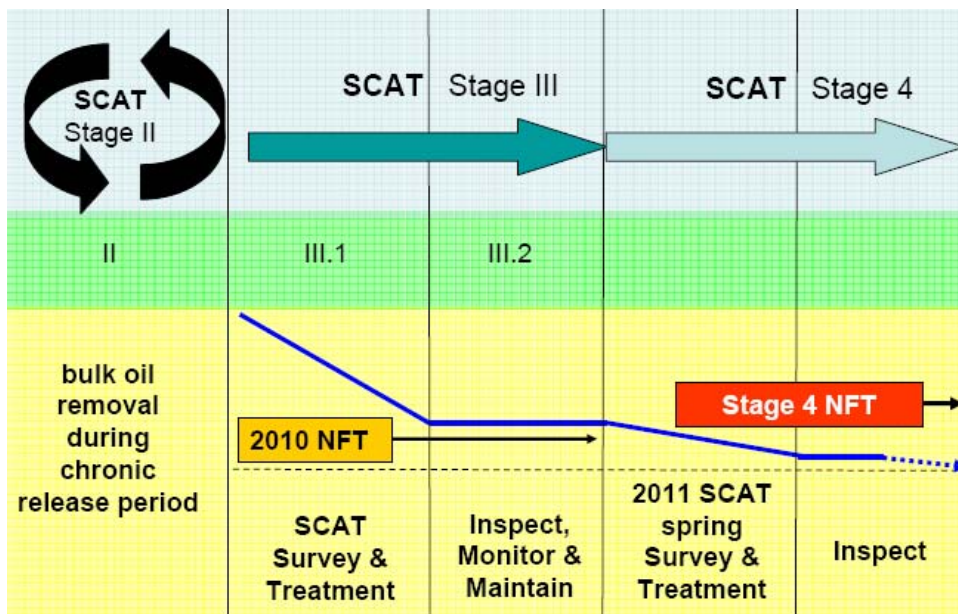


Figure 2 - Stages of shoreline cleanup during the Deep Water Horizon spill

STAGES I and II featured:

- Continual threat of re-oiling from offshore
- Removal of heavy and moderate oil conditions only
- Continued further treatment only where there was clear environmental, amenity, or other considerations requiring more treatment at that stage

STAGE III

- Stage III encompassed all oiling conditions (not just Heavy/Moderate conditions in Stages I-II)
- The starting aim of Stage III cleaning was to reach 2010 no further treatment (NFT) consensus criteria and lay the groundwork for future stages of cleanup
- A broad range of Stakeholders and Constituents were involved in determining acceptable completion of shoreline treatment
- A strong element of consensus-building was inherent throughout Stage III
- The over-riding principle remained constant: Cleanup should not cause more damage than the oil itself

It was vital to achieve consensus on:

- issues of concern regarding shoreline resources and their sensitivity and protection
- Treatment techniques and the options readily available (or under close development), including operating parameters and limitations

- Clarity, recognition and acceptance of what could be achieved before cleaning activity could become unsafe, impractical, gave no significant benefit, or could start to cause further damage to a shoreline habitat/resource - the Net Environmental Benefit Analysis (NEBA) balance

DECISION-MAKING PROCESS

At the outset of the SCAT program, a SCAT Shoreline Cleanup Plan was prepared, reviewed, and endorsed by the Unified Area Command, which outlined the key SCAT program processes. To supplement this, a detailed Stage I/II Shoreline Response Plan was similarly prepared, reviewed and endorsed at each ICP - one each for the Houma sector of operation mainly in Louisiana and for the Mobile Sector - Mississippi, Alabama and Florida. Detailed recommendations were endorsed for each type of shoreline, the anticipated oiling conditions and the response techniques to achieve an agreed level of cleaning. Comprehensive, unified field surveys were undertaken, assessments were made, and Shoreline Treatment Recommendations (STRs) generated by the SCAT program were then implemented by Operations during this time, all in accordance with these Plans.

Once steady state conditions had largely been established, the final stage of cleaning could begin to be planned (Stage III). The consultation process then involved a much larger number of agencies at all levels of government. In order to manage this crucial element of the decision-process, Core Groups were created that comprised key stakeholder representatives from Houma and Mobile who were involved in the emergency response. These Core Groups made the key decisions on recommended methods, options and goals for shoreline treatment (STRs) based on both the technical

reference materials provided by individual Technical Working Groups (TWGs), and on the wider issues and concerns of the Core Group members and other constituents.

The Core Groups were tasked to deliver shoreline plans for approval by the Unified Command that defined:

- Convergent views on shoreline treatments and No Further Treatment (NFT) points as appropriate to Stage III cleaning in 2010 and Stage 4 in 2011
- A Stage III.1 and a III.2 Shoreline Treatment Plan each in two parts:
 - Methodology for survey, verification and documentation of oiling conditions
 - Site specific treatment methods and NFT guidelines
- Stage4 Shoreline Treatment Plan in two parts:
 - Methodology for survey, verification and documentation of oiling conditions
 - Site specific treatment methods and Stage 4 2011 NFT guidelines
- Engagement with wider Constituents that they represented or normally engaged with; to gain wider understanding, recognition, convergence and acceptance of all Stage III and 4 response decisions

Reporting to these Core Groups, the Technical Working Groups (TWGs) were established to deliver clear technical guidance for decision-making purposes on:

- Oiling conditions to be treated
- Treatment methods (including expected performance, effectiveness, operational parameters, limitations etc)
- Best practice features for inclusion in Stage III and 4 STRs (including ecological, historic/cultural constraints, etc)

Three TWGs were set up, representing both ICP's (Houma and Mobile), to address:

- Sand Shores
- Coastal Marshes and Mangroves
- Man-made Shorelines

SHORELINE SURVEYS AND TREATMENT RECOMMENDATIONS

- The generation of Shoreline Treatment Recommendations (STRs) included:
 - Recommended treatment activities and recovered material management strategies.
 - Cultural resource (NHPA Section 106 Consultation) and environmental (Endangered Species Act, Section 7 Consultation and Essential Fish Habitat Consultation) Best Management Practices (BMPs).
- Coordination of the inspection and signoff program.

In Stage II the focus of the SCAT surveys and the STRs was to locate and recover bulk oil as it came ashore. At that time, many of the cleanup operations were done under the guidelines established in *General* STRs developed for each State and for specific shore types.

In Stage III, a series of STRs were generated during each phase (Figure 3). In Stage III.1 a set of 2010 No Further Treatment (NFT) guidelines were developed by the TWGs to reduce oiling levels sufficiently to enable natural attenuation to continue through the 2010-2011 winter months. The period of natural attenuation was termed Stage III.2 Monitoring and Maintenance phase (Figure 2). The Stage 4 spring 2011

SCAT survey is generating a further set of STRs based on revised 2011 NFT guidelines, agreed upon by the Core Groups and signed by the consolidated ICP in New Orleans, to bring closure for the response operation, recognizing that some locations may have residual oil that would further naturally attenuate.

The Stage4 process closely followesthe same kind of step-wise process as illustrated in Figure 2, with the exception that the last steps are the Survey Inspection Report (SIR) inspection measuring against Stage 4 2011 NFT guidelines, that eventually lead to a segment sign-off, signifying completion of the response operation.

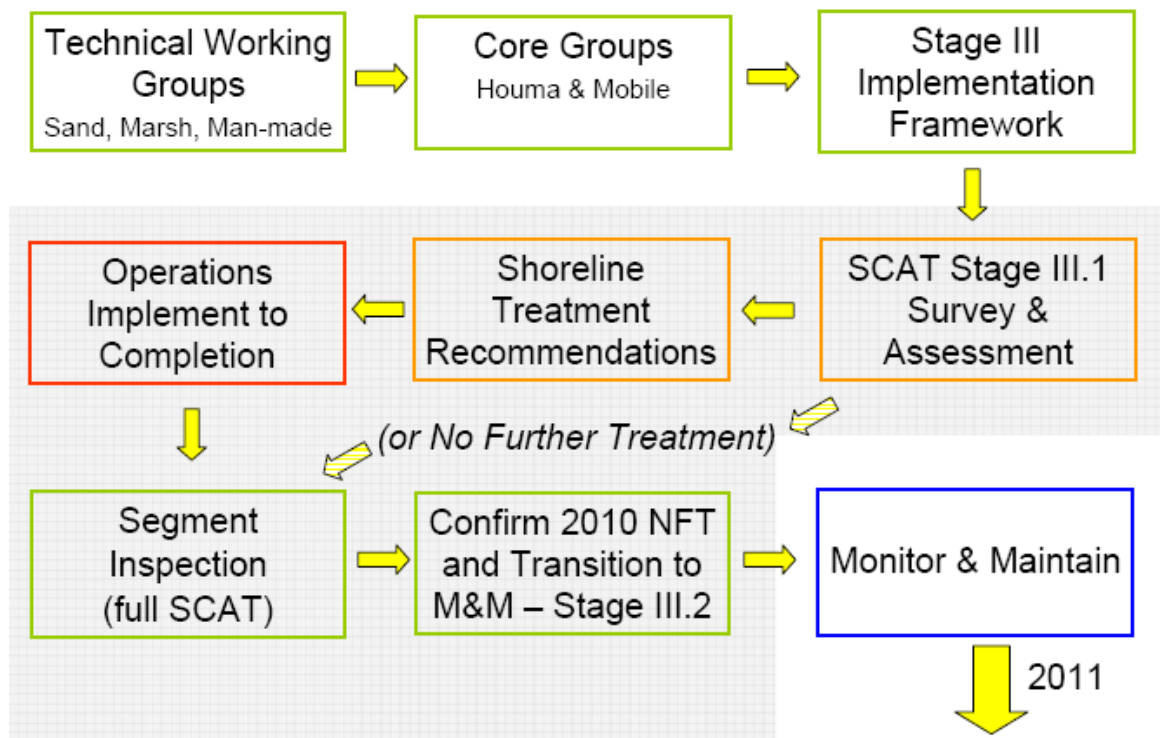


Figure 3 - Detailed Steps in Stages III.1-III.2, leading to Stage 4

DISCUSSION

The SCAT shoreline response to the incident presented many challenges, often generated by the sheer scale and duration of the event. Additional features include the uncertainty about continued oiling and an evolving situation which regularly changed the theater of activity west and eastwards, driving escalation and challenging overall coordination and control. Among the many features of the conventional SCAT process which were enhanced, the following core and new features would benefit any future SCAT process, including:

- The management of SCAT as a formally expressed program to ensure full coordination and consistency across all incident command, technical, and stakeholder arenas
- A phased approach to shoreline cleanup - to address defined stages and clear intermediary transitions and final end points
- Clearly defined stakeholder Core Groups and Technical Working Groups to ensure full inclusion
- Consensus decision-making on the cleanup techniques required; on the environmental, cultural and socio-economic criteria and restrictions to protect sensitive resources; and on the degree to which cleaning should be done or could feasibly be achieved - i.e. the NEBA balance
- Sustained coordination and cooperation with all stakeholders in the generation, review and implementation of STRs, survey inspections (SIRs), transitions from one stage to another (NFTs), and eventual sign-off
- The inclusion of cultural resource and historic property specialists as an integral part of the SCAT structure and process

- Close connection and coordination with Operations through the SCAT- Ops Liaison role - to ensure STRs are clear, understood, implemented well and achieve effective intended results

CONCLUDING REMARKS

During the oil spill response, the SCAT process was tested well beyond the scale envisaged by its originating architects. It proved itself robust and successfully drove the process for shoreline survey and assessment, consensus decision-making, cleanup implementation, and agreement on defined transition points and final end points.

It is a testament to the technical expertise, commitment and sheer hard work by all of those involved - State, Federal, and Responsible Party representatives - and many local Stakeholders; that a truly unified and cooperative approach was achieved. This is all the more remarkable, given the SCAT program began in April 2010 and will not be completed until some time after April 2011.