

RETHINKING SHORELINE RESPONSE PLANNING

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ABSTRACT

A Shoreline Response Programme (SRP) provides the robust means to drive the most efficient and effective integrated shoreline response. An SRP should be triggered as soon as an event occurs for which there is a likelihood that oil could reach shorelines in order to avoid implementation delays so that potential shoreline impacts can be minimized. However during the first phase of a response there are numerous challenges to this, including the competition for attention and resources as well as establishing clear communications between management decision makers and field operations. The SRP approach should be an integral part of contingency planning and training, to ensure that response planners exercise this critical component of a first response and to ensure organizational capability is in place.

INTRODUCTION

From time to time an event or a series of events can produce a change in strategic thinking or operating practices. Experiences over the past few years indicate that a majority of planning and operational effort is typically directed towards a multi-faceted and intensive offshore/nearshore strategy to recover or eliminate oil on the water before it reaches the shore zone. The objective of this strategy is to minimize the potential impacts of a spill in the nearshore and coastal zones as these are the areas, with few exceptions, of greatest potential and actual short and long-term effects of an offshore/nearshore oil spill. This emphasis on offshore/nearshore strategies is usual for many marine and coastal spill response operations even where treatment and recovery rates are relatively low..

Shoreline cleanup is arguably the most intensely scrutinized and potentially expensive, in terms of time and effort, part of any response. Planning for shoreline cleanup can be very challenging as conditions and restrictions can be complex and variable. Notwithstanding the types and volumes of oil, the range of primary factors affecting a shoreline cleanup strategy include potential oil pathways, shore types, seasonal coastal ecosystem and individual resource sensitivities, stakeholder involvements, and tactical cleanup options and restrictions. Few organizations typically provision dedicated resources for shoreline cleanup: these must be identified and mobilized for a specific scenario (shore type, oil character, volume, etc.). However, a readiness to respond rapidly and expertly to oil on shore is vital as cleanup actions typically are most effective and efficient immediately following deposition, before oil is remobilized, buried, or weathers to a state more difficult to clean.

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These planning challenges often mean that strategies and crucial tactical details in a shoreline response plan are developed while oil is nearing the coast or even after the oil is onshore. The **Shoreline Response Program (SRP)** approach has been developed to address these challenges. The model SRP is a paradigm shift in the sense that this represents a change in some basic assumptions for spill response planning and first-phase response operations related to shorelines. The primary outcome of this strategic change would be the recognition of the vital objective to treat and remove oil from shorelines as rapidly as possible and for this to happen there needs to be a culture of planning and response organization that elevates shoreline response to a higher priority and more appropriate level of preparedness.

THE PROBLEM

- The potential for short and long-term effects of a marine oil spill that reaches a shoreline is substantial.
- Shoreline cleanup has the ***greatest gain when oil is first deposited*** on the shoreline as this reduces the:
 - ***effects of the oil in the shore zone,***
 - ***exposure time for shore zone resources at risk,*** and
 - ***level of effort and time*** required to cleanup up oiled shorelines.
- Usually most planning and training efforts are directed towards offshore/nearshore response strategies. Shoreline response operations and SCAT typically are ***not a significant component of drills or training,*** which tend to focus on the first phase of a marine response. As a result, management and response planners do not exercise this critical shoreline component of a first response with the effect that little organizational capability or problem recognition are developed.
- Challenges may be encountered during the first phase of a response when shoreline-related requests are presented, for example, for dedicated resources such as vehicles, boats, or helicopters for SCAT team deployments or aerial shoreline reconnaissance surveys. With attention on source control and marine response activities, the need to prepare or immediately implement a shoreline response is not always appreciated and prioritized.
- The competition for attention and resources is greatest during the first response at a time when shoreline oil removal can be most effective and efficient and thereby minimize damages in the shore zone. This competition declines as on-water and offshore/nearshore operations demobilize. However, this is after the opportunity is missed.
- Sharing resources, for example, between different incident management teams, such as Operations, the Environmental Unit, or SCAT, usually creates sub-optimal or potentially ineffective outcomes, since their objectives and missions are very different.

- Except for small-scale events and operations, for SCAT to be effective and able to process data in a timely manner, requires a dedicated GIS (Geographic Information System) capability. These resources are best embedded within the SRP/SCAT team.
- Shoreline operations typically involve the **major resource effort and cost component** of most oil spill responses, large or small as shoreline operations **continue far longer** than the higher profile on-water phase of a response (Figure 1: Owens *et al.* 2014).

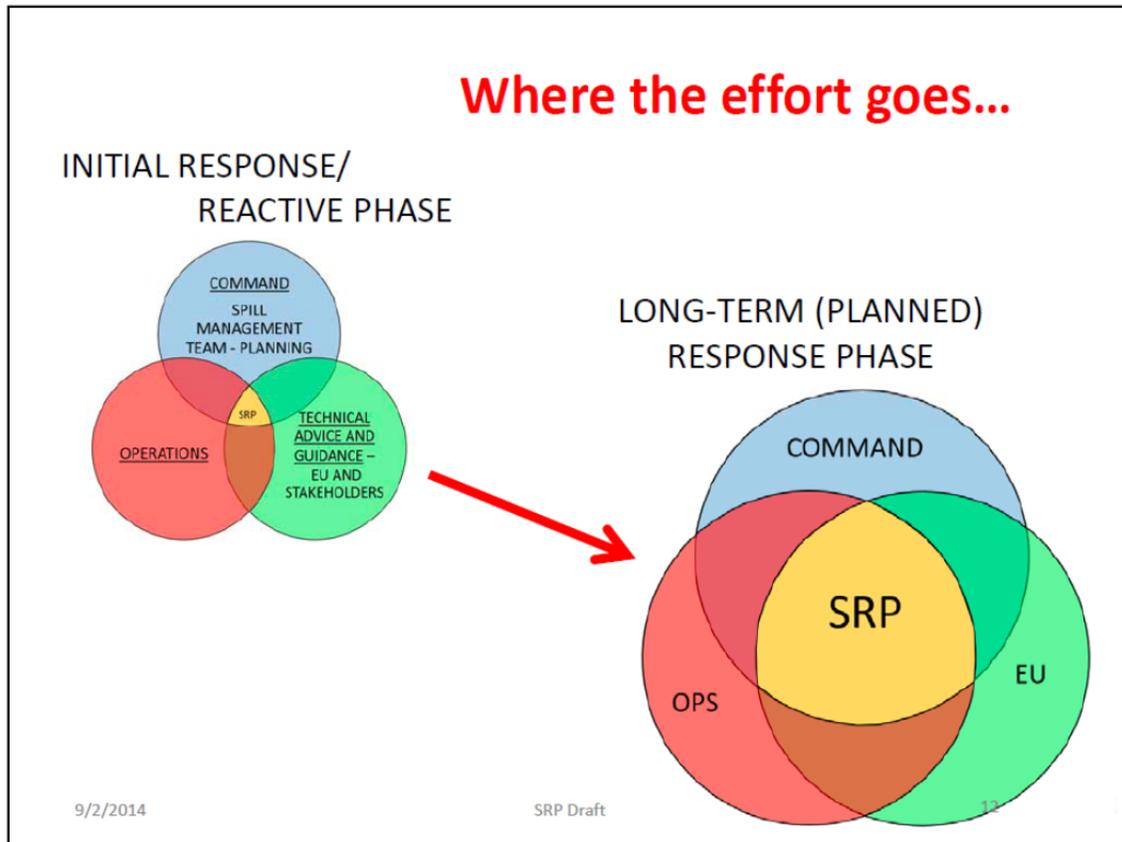


Figure 1. Schematic of the shift in relative effort on a response through time

THE DRIVER

- Lessons from spills (over the past 25 years) have shown that the response to oil on the shoreline has typically been a lower initial priority compared to offshore/nearshore activities with the result that:
 - Shoreline cleanup has not been as effective as it could have been with respect to shoreline assessment survey programmes (SCAT), data management, as well as coordination and communications between the management team and field operations.
 - The mobilization of shoreline response personnel and resources may be delayed or under estimated.
 - **Opportunities to minimize impacts can be missed.**

- **Cleanup efforts and costs can be much greater** than they could have been.
- Planners and response managers sometimes assume that SCAT “**solves the shoreline problem**” by generating data and information. In reality, SCAT is simply **a tool to collect that data and information and to use those results to develop recommendations – SCAT does not do strategic planning nor make decisions**. SCAT is not the full solution but SCAT is a critical and very integral part of a Shoreline Response Program (Owens *et al.* 2011).

THE SOLUTION

The problems described above can be addressed by rethinking how a shoreline response can best be designed and implemented. This involves a paradigm shift that creates a planning and preparation culture and a management structure to elevate shoreline response to a higher priority and level of support. The development of a Shoreline Response Program (SRP) within existing spill management systems addresses these challenges by harnessing the recognized strengths of SCAT within an integrated and focused team.

- The components of a typical SRP are:
 - Shoreline assessment (SCAT) surveys to expertly document and characterize shoreline oiling conditions,
 - A data management capability to process and present this information to a variety of users,
 - The development of First Response phase recommendations for shoreline response priorities, in conjunction with Environmental Unit Technical Specialists and Operations, based on key factors such as:
 - the potential for stranded oil remobilization,
 - the vulnerability of significant resources at risk, and
 - locations of accessible highest oil concentrations.
 - Support to decision makers and stakeholders during the Planned Phase with recommendations and advice regarding appropriate clean-up strategies, priorities, end points, Best Management Practices (BMPs), and tactics,
 - Clear engagement with Operations to implement cleanup, and
 - A monitoring and inspection process that confirms that the approved end points have been achieved.
- At the beginning of a response, if the potential exists for oil to reach the shoreline or if the shoreline is already oiled, the Environmental Unit Leader would **immediately implement an SRP programme with the clear aim to minimize short- and long-term impacts to shorelines**. The shoreline response should be initiated and run aggressively in parallel with the offshore/nearshore response, rather than following on, as oil reaches shorelines.
- Contingency or response plans would include a Shoreline Response Program (SRP) as part of the planning, preparation, and training process in a similar way in which offshore/nearshore operations are addressed.

KEY FEATURES ON A SRP

- The primary functions of an SRP are to:
 - Initiate, implement and manage a SCAT program
 - Provide survey data and information to the SMT decisions makers
 - Provide Shoreline Treatment Recommendations (STRs) to the SMT based on field observations and discussions with Operations
 - Coordinate between the Spill Management Team (SMT) decision makers (UC/PS/EU) and Operations (USCG 2014) to generate and manage an SRP Plan, which would include approved STRs and Best Management Practices (BMP) guidelines
 - Support Operations during the implementation of the SRP Plan
 - Provide SCAT teams for the inspection and completion process through Shoreline Inspection Reports (SIRs)
 - Conduct and/or support field trials and demonstration to develop appropriate treatment and cleanup tactics.

- The vital function of an Environmental Unit (EU) is the consensus that is developed between the EU Technical Specialists and stakeholders who focus primarily on *environmental* issues. This decision process defines the shoreline response objectives, priorities, constraints (BMPs), and end points, and the inspection process by which closure can be achieved.

- An SRP brings together the decisions generated by the SMT/EU and the SCAT data to **create, implement, and manage a Shoreline Response Program Plan (SRP Plan)**. The SRP Plan includes the STRs and BMPs approved by the SMT.

- Importantly, the SRP liaises with Operations in the Command Post and in the field (usually a SCAT team role) to ensure that the SRP Plan, the STRs and the BMPs are understood and implemented. This bridging between the SRP/SCAT and Operations is a vital element for the implementation of the consensus decisions developed by the SMT.

- In effect, the EU focuses primarily on the decision process whereas the primary function of an SRP is the systematic implementation of SCAT missions and the STRs (Figure 2). A key advantage of an SRP that integrates shoreline planning, STR generation and implementation, and Operations support within one team is the consistency that is achieved across the response.

- SCAT field teams **generate shoreline oil distribution and characteristics data** that are the foundation for all recommendations developed by the EU/SMT.
 - SCAT information and recommendations are used by decision makers, in part, to develop shoreline response **objectives (end points), priorities and BMPs** from the beginning.
 - SCAT teams generate **Shoreline Treatment Recommendations (STRs)** for segments which do not meet treatment end points: these STRs are basically a "**work order**" for the Operations using the **ICS 204** form process (USCG 2014).

- SCAT teams **support Operations** in the field throughout the response **to understand the STRs and especially the end points and the BMPs**. A dedicated “SCAT Operations Liaison Team” may be appropriate on larger responses where SCAT teams do not have sufficient time to support Operations and Field Shoreline Supervisors (Santner *et al.* 2011).
- SCAT teams conduct **inspections** to determine and verify when end points are met, so that No Further Treatment (**NFT**) is required and Operations can demobilize from a segment (**a completed Shoreline Inspection Report (SIR) = “closure”**).
- AN SRP and a SCAT programme are not something that should be thought of as “optional” or a “concept” or representing response activities that simply begin after offshore/nearshore operations are finished.
 - SRP and SCAT is the fundamental way to address shoreline potential impacts, implement clean-up actions and achieve agreed appropriate closure - **“cradle to grave”** - fully integrated across the response organization and involving all relevant stakeholders...

A DEDICATED, SEPARATE SRP IS APPROPRIATE FOR A SHORELINE TREATMENT PROGRAMME

- Having a defined SRP avoids shoreline response being overlooked or not prioritized sufficiently in the first response phase during the **“competition for attention”** (*management time for decisions, as well as people and assets*). An SRP provides a focus to rapidly design and implement a shoreline response when the greatest gain can be achieved.
- An SRP integrates the varied components of a shoreline response to support the EU by the delivery of timely SCAT data and treatment recommendations and supports Operations through the SRP Plan and direct communication to interpret the SRP, STRs and BMPs.
- **An effective SRP needs management time and support** related to the scale of the operation. On a small-scale response, the SRP may involve a few people whereas on a larger operation the SRP may be a separate SRP/SCAT team managed by a Deputy Environmental Unit Leader and supported by an extended team (Figure 2).

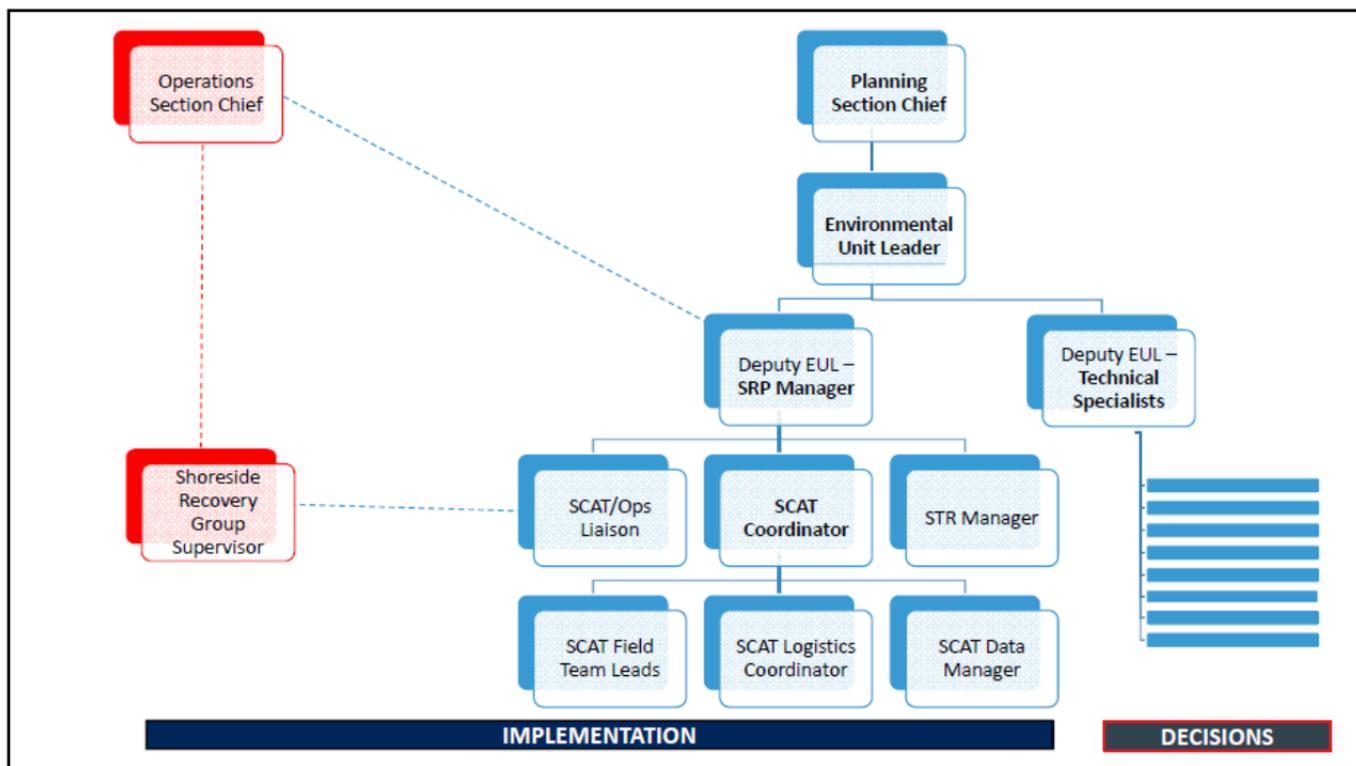


Figure 2. Example of the structure of an SRP/SCAT for a medium- to large-scale response

HOW AN SRP FITS WITHIN THE MANAGEMENT ORGANIZATION

- An SRP would be most effective as a part of the Planning Section or part of the Environmental Unit (see Figure 2 for the latter).
- The “**decision process**” for a shoreline response is directly supported by SCAT data and other information (such a weathering projections, resources at risk, etc.) that are used by the SMT to set objectives, strategies, priorities, end points, Best Management Practices (BMPs), and tactics based on recommendations that are generated by the Environmental Unit (EU) and SCAT.
- These decisions can best be implemented through an integrated SRP that includes the Shoreline Treatment Recommendations (STRs) generated by SCAT and approved by the SMT.

SCAT AND AN SRP

- A SCAT reconnaissance and a shoreline response during the first response phase are critical to the success of **minimizing environmental, economic, and social impacts and long-term effort** (IPIECA 2014; NOAA 2013).
 - These enable rapid decisions and mobilization of shoreline response resources.

- A dedicated and separate SRP within the EU provides an optimal approach to the strategic integration and management of the SCAT/STR/SIR process as phases evolve throughout the response.
 - In particular, an integrated SRP is more efficient because SCAT/STRs/SIRs are not specifically covered by management (SMT or ICS) guidelines and work on ***different time lines to the short-term Incident Action Plan (IAP) cycle.***

ADVANTAGES OF AN SRP

- ***Elevates SRP activities*** to a higher level of recognition within the SMT, particularly during the first response phase - with the express mission to ensure appropriate and timely allocation of resources (management time, personnel, and logistics support).
- Develops objectives and targets for first response actions when ***shoreline response actions can be most effective.***
- Provides an integrated, focused programme that combines the varied components of management decision processes, planning, implementation, operational support and inspections.
- Creates a vehicle for ***long-range strategic PLANNING*** from the beginning of a response.
- Builds on the ***proven attributes of the SCAT process*** (supporting the decision process, the planned operational phase, and the completion phase).

SUMMARY

Shoreline cleanup has the greatest gain when oil is first deposited on the shoreline. A Shoreline Response Programme (SRP) should be triggered as soon as an event occurs for which there is a likelihood that oil could reach shorelines in order to avoid implementation delays so that potential shoreline impacts can be minimized.

The three key components of an SRP are:

1. Generation of information from shoreline assessment survey(s) that is used during the initial response to define shoreline response priorities;
2. Support provided to the decision makers with recommendations on shoreline cleanup objectives, strategies, tactics, priorities, end points, and best practices; and
3. Engagement with Operations to implement the cleanup decisions and to confirm that the end points are achieved.

An SRP provides the logical mechanism to drive the most efficient and effective integrated shoreline response. The SRP approach should be an integral part of planning and training to ensure that response planners exercise this critical component of response.

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