

Risk Assessment and Resource Planning in Oil Spill Preparedness and Response

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The approach to risk assessment and its mitigation has changed significantly post Macondo, a tragedy that has become a watershed for the industry and a resolve to ensure there is never a repetition.

Prior to Macondo, the shape and scale of the approach to oil spill response preparedness and response had been determined by the marine transportation oil spills through the later decades of the twentieth century. The frequency and severity of these maritime oil spills led to a range of regulatory and industry initiatives including international conventions, changes in vessel design, development of crew competency as well as a broad acceptance that national governments are better placed to have national contingency plans in place and to lead the response to a major oil spill within their jurisdiction. The result of all these initiatives has been a steady decline in the number of major maritime oil spills through the late nineteen nineties to the present time.

The upstream industry, sustained by a long track record of offshore drilling without serious incident, operated under this paradigm until the Montara (Australia, 2009) and Macondo (Gulf of Mexico, 2010) incidents highlighted the particular challenges to oil spill preparedness and response that exploration and production activity can bring.

The intent by the industry in the last five years on strengthening oil spill preparedness and response capability for upstream activities has been highlighted by the collaboration across the Joint Industry Project (JIP) work groups and the significant investment in developing an industry subsea intervention capability.

Contingency planning has become more structured and detailed. A comprehensive understanding of risk ensures that areas or resources under threat from an oil spill are identified, the most appropriate response strategies are developed and resourced and that there is the opportunity to engage with the relevant stakeholders in advance of any activity. A scenario-based approach to contingency planning gives flexibility in determining the threats that an oil spill presents to an operation and, importantly, ownership in the accurate assessment and mitigation.

Lengthy contingency plans that focused on regulatory approval have evolved into more fit for purpose and functional plans. A portfolio of contingency plans including site specific plans, tactical response plans and logistics plans provides a more holistic and pragmatic capability to mitigating risk. The tools available to the contingency planner have become more sophisticated with, notably, three dimensional modelling becoming the norm to assess resources at risk from an oil spill. Verifying that resources identified in a contingency plan exist in practice and are accessible in the event of an incident has also become more evident.

The tiered response concept remains a key tenet in how to deploy industry resources in the most effective way. The traditional nine-box square has long been used to determine whether an oil spill was a tier 1, 2 or 3 incident and, hence, what was the appropriate level of response leading to an implied staging of resources. The three tier model has recently been adapted, recognising the advances in response technology, logistical capability and communication tools that have improved the ability for global resources to be cascaded to an incident location. A new capability wheel now identifies 15 elements of spill response capability and places the planning focus on assessing the capability for each element in the area of operation in terms of what resources can be sourced locally (tier 1) and what resources must be imported from further afield (tier 2 or tier 3). This approach will give a more integrated response and ensure that the necessary resources can be cascaded in a timely manner into the area of operation. The approach should be to maximise the initial response to an incident; scaling down is inevitably easier than having to source and import additional resources should an incident becomes more serious.

The core of any capability is whether the responsible party for an oil spill incident has the operational wherewithal to respond. Ever more attention is justifiably focused on incident management systems. The Incident Management System provides an organisational structure that can be flexed to the scale of the incident as well as identifying the roles and responsibilities to deal with it. The response to an upstream incident can be complex and prolonged requiring organisations to have both the capability and experience to effectively manage the incident over an extended period. In addition to this operational capability, regulators are also now looking for financial assurance that a responsible party can sustain a response.

Technology developments offer opportunities to enhance the encounter rate in combatting oil spills. Dedicated aircraft with sensors and communication tools can quickly relay key information on an oil spill to the command centre. This facilitates greater speed and quality in decision making and the initiation of the most appropriate response strategy. Looking forward, unmanned aerial vehicles (UAVs) and autonomous underwater vehicles (AUVs) offer further opportunities to maximise encounter rates and to monitor the progress of a response. Perhaps, the greatest technological challenge in the future will not be the lack of data but rather the ability to store and process all the data from an ever-growing range of sources into a timely and meaningful output to support decision-making.

Intuitively, it would seem sensible to use the most effective response strategy first in a response but the application of dispersants, which offer the best means of combatting an oil spill on the widest scale, remains a challenge in terms of approval and strategic choice by regulators and misunderstood by the media and the community. Ensuring global consistency in dispersant approvals and permitting is an industry priority as is improving awareness on the benefits of dispersants inside industry and in the community.

Significant progress has been made in evolving and developing the approach to risk assessment and resource planning in the last five years. However, much of this progress has been led by a core group of international oil companies and it is important to ensure the good practices that have either been reviewed or newly developed, be disseminated throughout the wider industry if they are to be sustained and adopted as the new benchmark of industry good practice. While the current focus has been primarily on upstream operations, industry should also be aware of new or emerging risks (as well as maintaining focus on pre-existing shipping sourced risks) that may arise and which may offer a new set of oil spill preparedness and response challenges in the future.