THE DEVELOPMENT OF TECHNOLOGY IN RESPONSE TO CHANGING LEGISLATION[1]

Nick Moore
Oil Spill Response Ltd
Lower William Street
Southampton
England SO14 5QE

ABSTRACT: *As environmental control and awareness increases globally, it is becoming progressively more important to be able to use existing oil pollution response technology in the most cost effective manner. In 1999 the Department of Trade and Industry, who govern offshore operations in the United Kingdom Continental Shelf, set some prescriptive guidelines regarding response capabilities. These guidelines set mandatory response times, to include surveillance and achievable oil quantity combat rates. The operators affected by these guidelines turned to their respective tier 2 and 3 response service providers and it became obvious that these guidelines were not achievable at that time. This poster will provide a case study of how two large oil spill response organisations joined forces to provide their customers with a solution to a potential "operation halting" problem. This solution involved the utilisation of current response equipment and the development of new equipment and operating procedures.*

Discussion

In 1999 the Department of Trade and Industry, who govern offshore operations in the United Kingdom Continental Shelf, set some prescriptive guidelines regarding response capabilities. These guidelines set mandatory response times and achievable oil quantity combat rates as set out below.All offshore operators affected by these guidelines looked to their respective Tier 2 and Tier 3 response service providers to cover this requirement. It was clear that these response times where not achievable by any of the response organisations with currently available technology at a realistic cost.

In Southampton, Oil Spill Response Limited (OSRL) already had the ADDS (Arial Dispersant Delivery System) Pack which has a dispersant carrying capacity of $19m^3$, enabling one sortie to treat up to $570m^3$ of split oil. The delivery platform is a Hercules L382G aircraft which could easily satisfy response time R4 but could not be mobilised quickly enough for R3. At the time the Hercules used as the operating platform for the ADDS Pack was subcontracted to short haul local contracts, with the requirement that it was always available within a response radius of 4 hours. This sub-contract capability was in place in order to keep OSRL's costs at a reasonable level for response purposes without adversely affect response times. As a short-term, initial response OSRL took the Hercules away from these contracts and put the aircraft on permanent standby at an airfield in the centre of the United Kingdom. The ADDS Pack was also relocated from Southampton, on the south coast, to the same airfield as the Hercules and an oil spill response technician was placed on 24 hr standby at the same location. These measures enabled OSRL to satisfy the R3 response time requirements but at what was recognised as an unsustainable cost.

To address the potential requirement of having the ability to fly a surveillance aircraft twice daily should the need arise, a hand-held UV camera was purchased and a second trained oil spill response technician was placed on 24 hour standby in Aberdeen. A contract was established with a helicopter operating company to enable mobilisation at short notice day or night. This also proved to be an expensive solution to an on-going requirement.

At the same time, Briggs Marine Environmental Services (BMES) had a dedicated surveillance aircraft based at Inverness which is equipped with video, infra red camera, GPS Global Positioning System) and a down-link capability. These attributes met the technical requirement for surveillance.

Production development wells and E&S wells			
Spill quantity (est)	UKDMAP seabird vulnerability level 1 in block. Ref 2,3		All other offshore environmental sensitivities
Up to 25t	R1	oil types 2,3,4	No R1 requirement
Up to 100t	R2	oil types 3,4	R2 requirement for 3,4
Up to 500t	R3	oil types 2,3,4	R3 requirement for 2,3,4
Up to 10,000t	R4	oil types 2,3,4	R4 requirement for 2,3,4
Response times: R1 = within 1 hour (CR = 10t/hr) R2 = within 2 hours (CR = 10t/hr)		R3 = within 6 hours (CR = 50t/hr) R4 = within 18 hours (CR = 50+t/hr)	

Figure 1: DTI Guidelines for response times and achievable combat rates

Driven by the need to develop a long-term sustainable cost-effective solution to meet the DTI's requirements, discussions took place between these two response organisations and a course of action was defined. An agreement was drawn up to offer a joint service to meet industry needs comprising of OSRL's ADDS Pack and BMES's surveillance aircraft. Even with this agreement in place the problem of meeting R3 at reasonable , sustainable cost still existed. What was needed was a fast responding, medium volume spray system. A system that could be used with a non-dedicated aircraft would be cheaper to operate. A system for use with a fixed wing aircraft would also prove to be more practical as it would have a larger operating radius and higher transit speed. After a review of current technology, it became obvious that there was nothing available to meet the requirements.

In order to develop the necessary technology, OSRL contacted Air Atlantique, who currently operate dispersant spray aircraft on behalf of the UK Maritime Coastguard Agency and also conduct routine aerial surveillance flights of the UK coastline. These activities make Air Atlantique a major player in the world of aerial dispersant application. Their design department proposed a design based on an external luggage-carrying pod for a Cessna 406. It was an under-belly mounted pod with a dispersant capacity of 1.25m^3. An electric motor would take power from the aircraft electrical system to power a pump to discharge the dispersant through rigid mounted spray booms. Using experience gained from development and operation of their existing spray systems, it was concluded that there was sufficient shear force generate by the slipstream to create dispersant droplets of a suitable size and that nozzles would not be required.

This system was designed, produced, tested and approved by the Civil Aviation Authority. One of these "pods", along with dispersant and a transfer system, is now placed on standby at Inverness airport in Scotland. A second pod with dispersant and a transfer system has been placed at Coventry airport in the British midlands.

Using these two pods together, based on a theoretical treatment rate of 20:1, some 74 m^3 of spilt oil can be treated per hour within five hours of the incident. With more amenable oils, this treatment rate can be increased.

Use of this new technology has also meant that OSRL has now been able to return the Hercules to its short haul freight contracts as the ADDS Pack is only needed to satisfy R4 response requirements within 18 hours

As a result of the three organisations, OSRL ,BMES and Air Atlantique, combining resources and experience to develop a new piece of response technology, within 12 months of this new legislation being introduced the joint venture was in a position to provide an acceptable level of response complete coverage at a sustainable cost.

Conclusions

The dispersant pod unit proved to be a most cost effective solution to the problem of providing a small "fit for purpose" response tool to supplement the OSRL Hercules/ADDS Pack spray system. The service is jointly delivered by OSRL and BMES and fully meets the requirements of the DTI and the industry in an innovative manner.

Biography

Nick Moore is a Senior Technician with Oil Spill Response Limited for whom he has attended many UK and International spills. Nick was a key member of the development team involved in the introduction of the UKCS dispersant system.

[1] DISCLAIMER: The opinions and views expressed in this paper are solely those of the author and do not necessarily represent the views of any other party.