Abstract

This paper summarizes an assessment of operational and environmental issues associated with dispersant use on oil spills from U.S. Minerals Management Service-regulated offshore facilities in the Gulf of Mexico. Among other things, the study examined: 1) dispersibility of oils; 2) capabilities and limitations of spray platforms; and 3) net environmental benefit of dispersing spills. Spill scenarios involving typical spill types, oil types, sizes, locations and environmental were analyzed.

In general, Gulf oils are light and apparently dispersible when they are fresh. The impact of weathering on dispersibility of GOM oils was assessed by analyzing oil spill scenarios. In each scenario, the time window (TW) for dispersion was estimated by oil fate modeling. Of the hundreds of crude oils produced in the Gulf, only 28 have been characterized sufficiently to permit modeling. Of these 28 oils: 14% appear to be highly emulsifiable (TW = few hours); 29% moderately emulsifiable oils (TW = one or more days); 32% low emulsifying oils (TW = many days); and 25% non-emulsifying oils (TW = almost indefinite). Based on this small sample, the majority of oils produced in the Gulf appear to be amenable to chemical dispersion.

The logistical capabilities of dispersant spraying platforms were analyzed using simple spreadsheet models. Platforms considered included: C-130/ADDS Pack, DC-4, DC-3, Agtruck AT-802, typical helicopter, and several types of workboats. Analyses considered properties of the platforms, spills, oil slicks, and distance from base to spill.

Net environmental benefit (NEB) of dispersants was determined by analyzing the impact of spill scenarios. The variables included spill type, location and seasons. Environmental impact and NEB were estimated using a spill impact assessment model. An important feature of this project was the use of newly completed, resource vulnerability databases to assess the vulnerability of target resources to the spills. The databases included: 1) Texas Coastal Oil Spill Planning and Response Toolkit (Texas General Land Office); and 2) Gulf-Wide Information System (MMS). The main finding of this analysis is that dispersant use offered a net environmental benefit in almost every spill scenario analyzed, provided the spill involved persistent oil that emulsified slowly allowing a TW of 36 to 48 hours.