DISPERSANT USE **APPROVALS IN THE UNITED STATES**

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Things You **Should Know**

All dispersant products used in the US must be listed on the US EPA National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Schedule.

Approved dispersants must meet minimum effectiveness requirements and the manufacturer must report toxicity test results.

The US Regional Response Teams (RRT) may preauthorize the use of dispersants in the waters of their region. Most of the RRTs have established pre-authorized zones for dispersant use.

During an incident, the Federal On-Scene Coordinator (FOSC) has the authority to approve dispersant use. This will often be considered in consultation with an Incident-specific RRT, made up of federal, state and local trustees.

Effectiveness monitoring is required during dispersant operations.

Dispersants are approved as a response option in many countries around the world.

Overview

Dispersants are products used in oil spill response to enhance natural microbial degradation, a naturally occurring process where microorganisms remove oil from the environment. All environments contain naturally occurring microbes that feed on and break down crude oil. Dispersants aid the microbial degradation by forming tiny oil droplets, typically less than the size of a period on this page (<100 microns), making them more available for microbial degradation. Wind, current, wave action, or other forms of turbulence help both this process and the rapid dilution of the dispersed oil. The increased surface area of these tiny oil droplets in relation to their volume makes the oil much easier for the petroleum-degrading microorganisms to consume.

Dispersants can be used under a wide variety of conditions since they are generally not subject to the same operational and sea state limitations as the other two main response tools — mechanical recovery and burning in place (also known as in-situ burning). While mechanical recovery may be the best option for small, near-shore spills, which are by far the majority, it has only recovered a small fraction of large offshore spills in the past and requires calm sea state conditions that are not needed for dispersant application. When used appropriately, dispersants have low environmental and human health risk and contain ingredients that are used safely in a variety of consumer products, such as skin creams, cosmetics, and mouthwash (Fingas, et al., 1991; 1995).

This fact sheet summarizes the process and decision-making required for dispersant use approval in United States waters. It is intended to provide a clearer understanding of dispersants, how their use is authorized, and their consideration in a decision-making process based on a Net Environmental Benefit Analysis (NEBA). For more information on NEBA, see **Fact Sheet #6 — Assessing Dispersant Use Trade Offs**.

Fact Sheet Series

Introduction

When an oil spill occurs, some adverse impacts are inevitable because the environment has been exposed to the spilled oil, even if it is only at the microscopic level. One primary goal of a spill response is to lessen any anticipated impacts using knowledge gathered from years of experience and research. For each spill, the available response options must be rapidly evaluated using a Net Environmental Benefit Analysis approach to determine which option or set of options, given incident-specific conditions, will result in the best outcome for the environment and which countermeasures will help minimize any adverse effects. In general, the pre-designated lead federal official, known as the Federal On-scene Coordinator (FOSC), relies on the results of the incident specific NEBA that will be performed by the responsible party in conjunction with scientific advisors, in order to determine whether dispersant use is appropriate.

The main categories of response options available for use in a spill include: 1) on-water mechanical containment, recovery and removal using booms, skimmers, etc.; 2) application of dispersants; 3) controlled (in situ) burning of floating slicks; 4) monitoring a slick for possible future action.

The objective of NEBA is to determine which option or combination of options should be used to remove/recover the spilled oil in order to mitigate the spilled oil's overall, or net, impact on resources and the environment. Because oil spreads quickly, on-scene conditions (wind and water currents) will determine the movement of the oil for large on-water spills. The response options used must be considered in relation to area-specific resources at risk, e.g., biological resources, environmentally-sensitive habitats, and human-use areas such as tourist beaches and marinas. Time-critical choices must be made about which option or options can be implemented immediately and effectively to manage potential impacts.

The collective worldwide spill response experience over the last 40 years has demonstrated that mechanical recovery alone is generally not able to recover a majority of spilled oil especially in large offshore spills. According to the US Office of Technology Assessment and by actual experience during a spill, mechanical methods typically recover no more than 10-15 percent of the oil after a major spill in open water (OTA, 1990). In more contained areas, e.g., a marina, a higher level of recovery may be achieved especially in calm conditions.

Because the majority of the spilled oil offshore likely cannot be recovered before spreading over a much larger area, decisions need to be made about how to best manage floating oil using a combination of response options for the incident-specific conditions. A key goal of a spill response is to prevent an oil slick from coming ashore. A decision to use dispersants involves evaluating the potential trade-offs: decreasing the expected risks to wildlife on the water surface and shoreline habitats while increasing the potential risk to organisms in the water column. Sometimes the use of dispersants is the only viable response option.

Regulatory Facts

The National Oil and Hazardous Substance Pollution Contingency Plan (NCP)

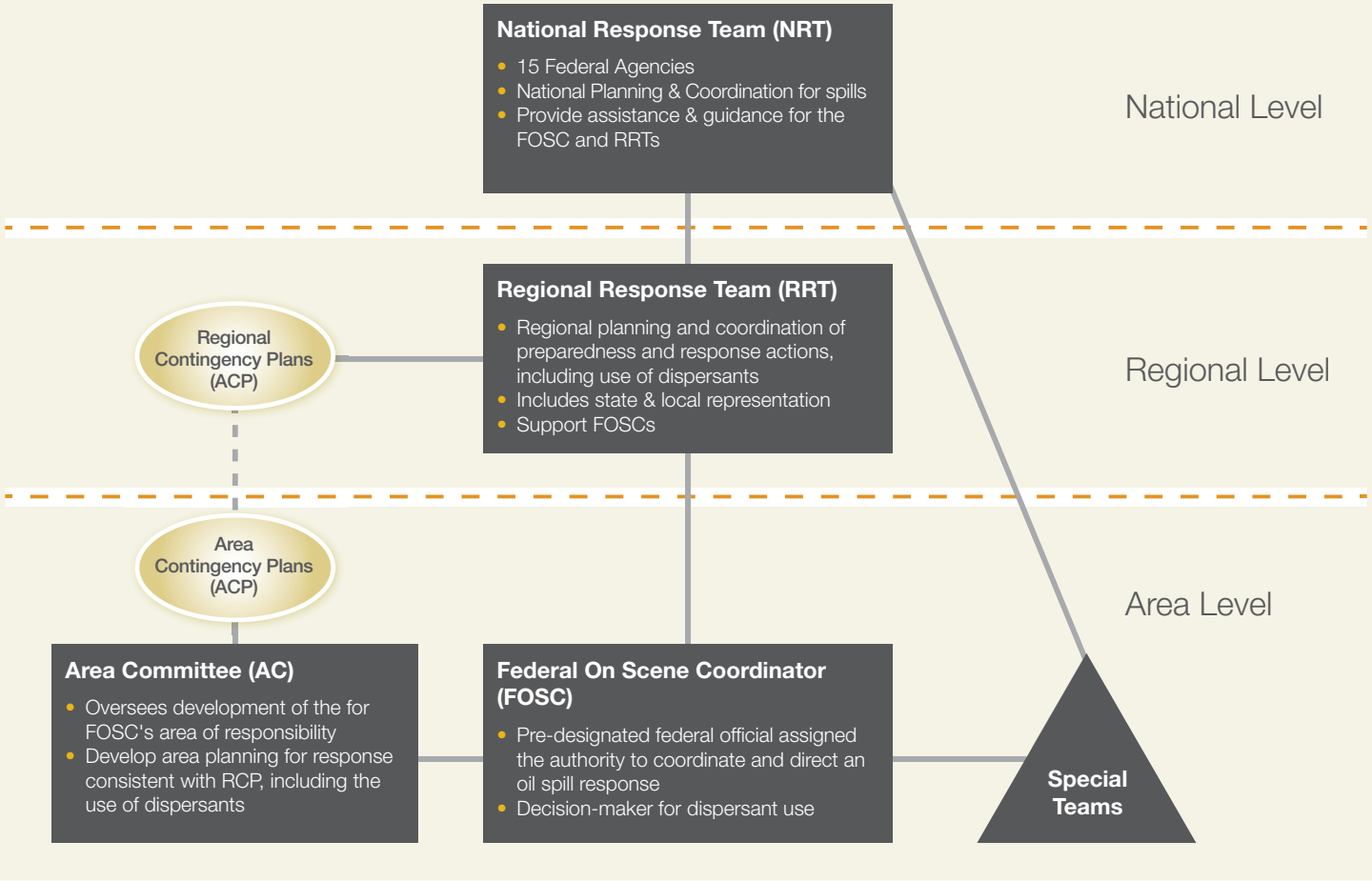
The National Oil and Hazardous Substance Pollution Contingency Plan (NCP) provides the "playbook" for oil spill response in the U.S. The organizational framework of the U.S. National Response System (NRS), as defined in the NCP is shown in **Figure 1** *(see next page)*.

The National Response System (NRS) is the mechanism for coordinating response actions by all levels of government in support of the Federal On-Scene Coordinator (FOSC) and is divided into national, regional, and area levels. The NRS is composed of the National Response Team (NRT), Regional Response Teams (RRTs), FOSC, Area Committees (AC), Special Teams, and related support entities. The basic framework for the response management structure is a unified command system that brings together the functions of the federal government, the state government, and the responsible party (i.e., the spiller) to achieve an effective and efficient response, where the FOSC retains authority (40 C.F.R. § 300).

Furthermore, the NCP specifies the response actions and responsibilities among the federal, state, and local governments and as well as the requirements for federal, regional, and area contingency plans. One component of these responsibilities is the development, selection, and implementation of response actions for each region including the procedures for the use of dispersants in spill response.

To address the needs for specific regional and area dispersant use policy, each RRT and AC defines their minimum requirements for the use of dispersants for an oil spill response. It should be noted, however, that the FOSC can approve the use of dispersants for safety reasons or in pre-approval areas without the need for concurrence of the RRT. If appropriate, the FOSC may include the use of products, including dispersants, to help limit the spread of the oil and to lessen its impact on the environment and potential resources at risk.

FIGURE 1. The National Response System (NRS) organization as dictated by the NCP.



The NCP Product Schedule

The Clean Water Act (CWA) Section 311(d)(2) and Section 4201(a)(G) of the Oil Pollution Act of 1990 requires that the President maintain a schedule of chemical and biological spill response countermeasures, including dispersants, that may be used to respond to oil spills to ensure that the products are used effectively and appropriately; the President has delegated this authority to the U.S. EPA.

Approval to use dispersants on an incident begins with the authorities laid out by the NCP. Subpart J (Use of Dispersants and Other Chemicals; 40 C.F.R. § 300.910) of the NCP is the U.S. EPA's Product Schedule for these regulated chemical and biological countermeasures (EPA online, 2011a). The Product Schedule is EPA's listing of the chemical and biological agents that have submitted the required information and, once listed, may be considered for approval by the FOSC for use during an incident.

Dispersants and other response countermeasures are required to be on this schedule if they are to be considered for use during a response. For a dispersant or other chemical to be listed on the Product Schedule, the manufacturer must submit specific test results and supporting technical data on their product to the U.S. EPA as defined in 40 C.F.R. C.F.R. § 300.915. For chemical dispersants, the listing requirements include tests for effectiveness and toxicity.

To be listed as a dispersant, the product must demonstrate a minimum effectiveness value as measured by a standard dispersant effectiveness test using defined test oils. Specific toxicity testing data, physical properties and other information about the product must also be submitted. In the wake of the response to the Macondo Well release the EPA now publishes the Toxicity and Effectiveness Data Summaries for all product categories on the Product Schedule, which facilitates comparisons and evaluations of products and categories.

NOTE: Inclusion on the Product Schedule does NOT indicate a recommendation or endorsement of any listed product by the EPA or other federal agencies; it only means that the manufacturer has submitted the required information for inclusion on the schedule and it may be used during a response.

Authorizations for Dispersant Use in the U.S.

The following sections outline the various responsibilities imposed on various agencies and organizations by the regulatory changes in U.S. policy.

The Oil Pollution Act (OPA 90)

The Oil Pollution Act (OPA 90) was signed into law in August 1990 and improved the nation's ability to prevent and respond to oil spills by establishing provisions that expanded the federal government's ability, and provided the money and resources necessary to respond to oil spills. In addition, OPA 90 provided new requirements for contingency planning both by government and industry.

The NCP was expanded in a three-tiered approach: 1) the federal government is required to direct all public and private response efforts for certain types of spill events; 2) Area Committees, composed of federal, state, and local government officials, must develop detailed, location-specific Area Contingency Plans (ACP); and 3) owners or operators of vessels, pipelines, and facilities that transport, handle, or store oil in certain quantities must prepare their own Response Plans.

As a means to address the requirements of OPA 90, a three-fold strategy was used nationally (with some location-specific modifications) to determine the regional and area planning and preparedness requirements for the use of dispersants in U.S. waters. This included:

Pre-spill Planning

Pre-spill planning, including evaluating the potential use of products listed on the NCP Product Schedule, was delegated to the RRT and AC decision-making bodies under the direction of OPA 90. The RRTs were charged with developing pre-authorization plans (also called pre-approval agreements) in advance of an incident to identify the following areas:

- **Pre-authorized zones** — areas where dispersants can be authorized by the FOSC without RRT concurrence.
- **Case-by-case basis zones** — areas where the FOSC must consult with appropriate agencies on the RRT, e.g., EPA, Department of Commerce (DOC)/NOAA, Department of the Interior (DOI), and states, to determine whether dispersant use is appropriate.
- **Exclusion zones** — areas where dispersants are not to be used.

Many RRTs have limited dispersant applications in marine waters to water depths greater than 30 feet (10 m) and in most coastal areas there is an additional requirement that the dispersants be used in areas more than 3 nautical miles (5.6 km) from shore which means use in near shore areas and estuaries is generally excluded.

Because these products are used to treat oil spills in open ocean waters, the FOSC is provided by the US Coast Guard (USCG). At this time, there is no dispersant available that is approved for use in United States freshwater environments.

Pre-authorization

Pre-authorization means that if agencies have signed a pre-authorization agreement, and if a spill meets the conditions outlined in the applicable Regional Contingency Plan (RCP), then the FOSC can approve dispersant use within specified zones as soon as he/she believes it will result in greater benefit than if they are not used.

To develop the pre-authorizations for dispersants, the RRT representatives from U.S. EPA and the states with jurisdiction over the state waters for each region, along with U.S. DOC and DOI natural resource trustees, conduct a NEBA review of the risks and benefits associated with chemical dispersant applications. This evaluation also requires an assessment of the likely impacts to threatened and endangered species residing or passing through the areas being considered by the RRT member agencies.

Each RRT will approve or disapprove the pre-authorization agreements which will be incorporated into the RCP and the associated USCG ACPs. Most pre-authorization plans outline zones where, or conditions under which, dispersants may be used. These are generally based on geographic area, distance from the shoreline, water depth, and/or season and may be limited by the presence of specific environmentally sensitive resources (e.g., a marine sanctuary).

The designation of pre-authorization areas, and the discussions that led to their establishment, can be very important steps towards a timely and effective spill response.

NOTE: The pre-authorization status for each region is available from http://www.rrt.nrt.org/ on the RRT regional links. Additional information on regional decision-making relative to dispersant use can be obtained from the USCG Vessel Response Plan Program under "Maps and Photos – Dispersant Usage Map."

Approvals During an Incident — Case-by-Case

If human health or safety is at immediate risk, the FOSC needs no approval for the use of dispersants as a protective measure. Otherwise, when the FOSC determines that the use of dispersants is required and there is no pre-authorization for their use, he/she may only use them with the concurrence of the EPA representative to the RRT and state RRT representatives in consultation with the DOC and DOI natural resource trustees. This group of state and federal agency decision-makers is also known as the Incident-specific RRT.

In most instances where a spill occurs in areas where pre-authorization is not in place, the USCG FOSC requests a decision by the incident-specific RRT within four hours of his/her initial request so that a dispersant decision is rendered in time to execute a dispersant operation and effective application, also known as the "window of opportunity". For more information on this topic refer to **Fact Sheet #3 — Fate of Oil and Weathering**.

After the initial consultation, the incident-specific RRT can agree to endorse the use of dispersants, possibly with specifically-defined use conditions, or they can veto their use.

Exclusion Zones

As stated, many RRTs have established areas within their region where dispersants may not be used. Many of these exclusion zones are located within state waters, typically in areas less than 3 nautical miles (5.6 km) from shore or with water depths shallower than 30 feet (10 m). The primary reason dispersants could be used in these areas is if human health or public safety is at immediate risk from the incident. As mentioned earlier, the FOSC needs no approval for the use of dispersants as a protective safety measure.

International Approvals

Dispersants are considered a primary response option in a number of countries and are approved for use in many countries, including the U.K., South Korea, Australia, Egypt, France, Greece, Indonesia, Italy, Japan, Malaysia, Norway, Singapore, Spain, Thailand, and a number of coastal African, South American, and Middle Eastern countries (ITOPF). The requirements for application are country-specific and must be verified prior to application.

Monitoring Requirements

In the U.S., dispersant approvals include operational monitoring requirements to assist the Unified Command in determining the effectiveness of dispersant application. This can include a definition of when dispersant use should be discontinued, e.g., definition of a threshold which if reached would result in stopping the dispersant operation. Ideally, the decisions to use and discontinue the use of dispersants are made based on objective scientifically-based research and effectiveness testing and involve the components associated with a relevant NEBA. Periodic operational monitoring allows the individuals managing the incident, i.e., the Unified Command (UC) to assess the effectiveness of dispersant use and determine whether their use should be continued.

In the U.S., monitoring of dispersant effectiveness and gathering potential exposure data is performed according to the *Special Monitoring of Applied Response Technologies* (SMART) protocols, a methodology that involves the use of three tiers of monitoring. In order of increased requirements:

- **Tier I** — Visual observations by trained observers,
- **Tier II** — On-water visual observations and fluorescence spectrometry at a single depth to measure oil concentrations under treated slicks; and
- **Tier III** — On-water visual observations, fluorescence spectrometry at multiple depths, and water chemistry sample collection to monitor horizontal and vertical spreading of the dispersed oil.

Updated Regulatory Status

In 2010, during the response to the Macondo Well release in the Gulf of Mexico, large volumes of dispersants were applied to offshore surface oil by aircraft and vessel (National Commission, 2011). Following this use, the RRTs were instructed to review their existing dispersant use policies and update their Regional

Contingency Plans (RCPs) to reflect the knowledge and experienced gained.

This was also the first instance where dispersants were injected into the oil release site where it exited the seafloor. Although this use of dispersants, known as subsea injection, had been previously studied and considered for possible use, this was the first documented successful application of the approach. As a result, subsea injection of dispersants is now considered by the coastal RRTs to be a potential option to mitigate the adverse effects from subsea oil discharges offshore. The National Response Team (NRT) has issued monitoring guidance for subsea use of dispersants. For more information on the subsea application, refer to **Fact Sheet #8 — Subsea and Point Source Dispersant Operations**.

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The current version of the NCP Product Schedule can be viewed at: http://www.epa.gov/oem/content/ncp/index.htm.