



**AERIAL AND VESSEL
DISPERSANT PREPAREDNESS AND OPERATIONS GUIDE –
American Petroleum Institute (API) Technical Report 1148**

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Abstract

Upon completion of the response to the Macondo Spill in the Gulf of Mexico in 2010, the American Petroleum Institute (API) formed a Joint Industry Task Force (JITF) to prepare guidance documents based on the lessons learned from the response. Because the aerial dispersant operations were successful in dispersing an estimated 15,000,000 gallons of oil by safely conducting over 412 spray flight and 816 spotter/reconnaissance flights, the JITF decided not only to record the lessons learned but also to document the preparations and the operational plans and procedures that were instrumental in achieving these results. The resulting Aerial and Vessel Dispersant Preparedness and Operations Guide is divided into two parts that provide guidance and examples on:

- Part 1 – Preparedness: Planning, organization, training, exercising, and other activities that can be conducted prior to an oil spill to ensure adequate readiness for dispersant application, and
- Part 2 – Operations: Response objectives and checklists, operational plans, procedures, meetings and forms that can be used to aid in obtaining regulatory approval and to effectively manage dispersant application operations.

The Guide can be used to develop a company’s or organization’s stand-alone dispersant preparedness and operations plan, or can be incorporated into applicable oil spill response plans (OSRPs). Although developed for U.S. based dispersant operations, the processes and examples represent best practices and can easily be modified for international operations.

Introduction

Pre-planning and preparedness, including preparation of a comprehensive operations plan, are critical in conducting effective aerial and/or vessel dispersant operations in the event of any offshore oil spill and especially for significant continuous releases of oil. To that end, the American Petroleum Industry Joint Industry Task Force (API JITF) prepared the Aerial and Vessel Dispersant Preparedness and Operations Guide (API Technical Report 1148) to assist industry, governments and other parties in preparing for and conducting dispersant application operations in the event of an offshore oil spill. This paper summarizes the content of the guidance document and highlights its key components.

Aerial and Vessel Dispersant Preparedness and Operations Guide Purpose

The purpose of the Guide is to provide the current best practices in:

- a. Preparedness – the planning, organization, training, exercising, and other activities that should be conducted prior to a spill occurring to ensure adequate readiness for dispersant application, and
- b. Operations – response objectives and checklists, operational plans, procedures, meetings and forms that can be used to aid in obtaining regulatory approval and to effectively manage the dispersant application to a spill.

Although the Aerial and Vessel Dispersant Preparedness and Operations Guide is designed for use in the United States, the guidance, assets and processes described therein are fundamental and can be easily modified for international use by companies, spill response organizations or government agencies to prepare stand-alone dispersant plans or can be incorporated into overall oil spill response plans (OSRPs).

The procedures and processes presented in the Guide are applicable for all sizes and durations of oil spill responses. However, the personnel and assets activated should be scaled accordingly for the specifics of the spill and/or the geographical response area; e.g., Tier II and III monitoring may not be possible for a dispersant operation only lasting a day or two. The full Incident Management System Dispersant Group structure and procedures are explained so that the users of this guidance can have a complete picture of operations to better tailor the dispersant response to a particular spill situation.

All of the forms, processes and procedures provided in the Guide can be altered by users to better fit their organizational structure and operational geographical area.

Aerial and Vessel Dispersant Preparedness and Operations Guide Overview

The Guide is divided into two sections:

Part 1 – Preparedness: Provides guidance, templates and information to evaluate dispersant capability needs for responding to an offshore oil spill and to ensure that all of the components for an effective dispersant response are in place and properly functioning prior to a spill. The key components include:

- Assessing dispersant capability needs to respond to potential spills
- Identifying adequate dispersant application assets and stockpiles
- Developing an Aerial/Vessel Dispersant Group organizational structure to manage dispersant operational within the Incident Management Team
- Establishing dispersant response activation procedures
- Developing a training and exercise program to maintain proficiency and readiness

Part 2 – Operations: Provides response processes, procedures and forms to manage, safely conduct, coordinate and document dispersant field operations. The key components include:

- Activation procedures and a checklist
- Standardized operational forms and procedures
- Concept of operations and response objectives

- Daily activity flow charts and tables
- Daily detailed dispersant application plans
- Documenting and reporting activities

In developing a dispersant response program it is critical to identify all of the components necessary for a successful surface dispersant response. Then it is necessary to ensure that each component is adequately staffed, equipped, properly functioning and integrated with the other components. Failure of any one component can significantly reduce the ability to apply dispersants.

Dispersant System Components: The components of a dispersant system discussed in the Guide are:

- Application aircrafts/vessels and trained crews
- Spotter/air control aircrafts and trained crews
- IMT Dispersant Group management/coordination team
- Dispersant Monitor/Observer/Surveillance aircrafts
- Trained dispersant observers and monitoring equipment
- Approved dispersant stockpiles in sufficient quantities
- Dispersant stockpiles effectiveness testing procedures
- Communication systems (satellite, marine, aviation) in all spray assets (spray, spotter and observer aircraft and spray vessels) and at staging bases.
- Flight tracking systems on spray and spotter aircraft and spray vessels
- Spray pass documentation and reporting systems on spray aircrafts
- Spray system testing and calibration data
- Staging airport/port ground support and management
- Logistics equipment and plans
- Dispersant transfer systems
- Dispersant operations plans, forms and data bases
- Health and Safety Plans
- Spray and support equipment maintenance plans
- Training and exercise program for all personnel and equipment

Preparedness Section Highlights

The following highlights illustrate the content of the Guide's Preparedness Section.

- a. **Dispersant Group Structure.** It is important to have a robust dispersant management team in the Command Post and at the staging bases to coordinate, manage and document the dispersant response efforts. Figure 1 illustrates the recommended organization structure for the Areal and Vessel Dispersant Group. The positions highlighted in red indicate those that are recommended to be activated for every dispersant spill response, regardless of the size. The positions highlighted in black should be activated as needed. Details of the roles and responsibilities are provided in the Guide for each position. A vessel staging base as well as staging airport organization structure (not shown here) is also included in the Guide.

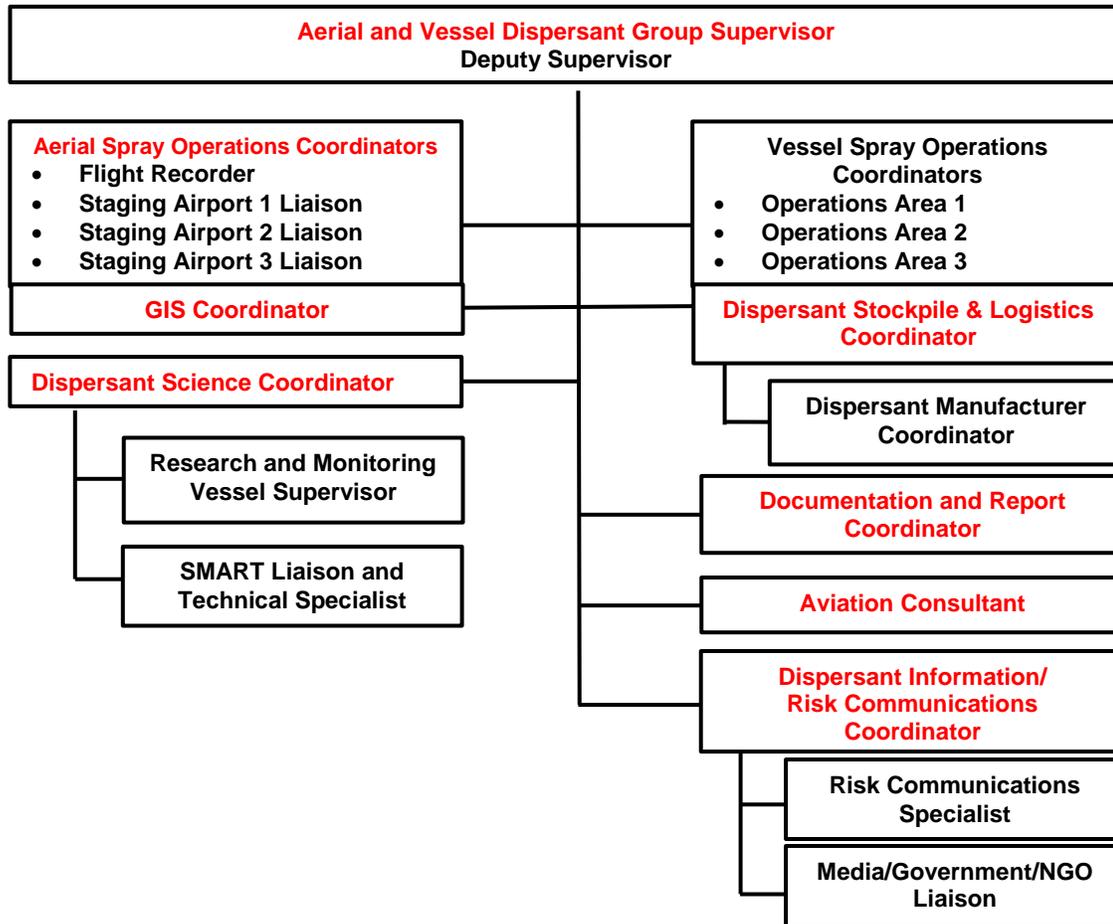


Figure 1. Aerial and Vessel Dispersant Group Organizational Structure

b. Estimating Dispersant Capability and Needed Assets. In preparing a dispersant response plan it is important to develop potential oil spill scenarios and to estimate the amounts of oil that could be potentially released. Based on these scenarios and spill estimates, the recommended amounts of dispersant that should be applied by various aircraft and vessels can be estimated using the Dispersant Mission Planner 2 (DMP2), available on a website of the National Oceanic and Atmospheric Administration (NOAA). Additionally, the adequacy (amounts and locations) of available dispersant stockpiles should be assessed. An example of the daily dispersant application capability of several spray aircraft and vessels when operating at a staging base 100 nm from the spill site and applying dispersants at a dosage of 5 gpa (gallons/acre) or 46.8 liters/hectare is shown in Table 1 below. The Guide provides procedures for how to determine the dispersant capability when using various staging bases and dispersant assets.

Table 1. Example of Dispersant Capabilities Estimation
(100 nm transit distance and dosage of 46.7 liters/hectare)

Aircraft	Payload (gallons)	Estimated Dispersant Application Capability 12 Hour Day (gallons)	Estimated Amount of Oil Treated 12 Hour Day (gallons / barrels)
C-130 with ADDS Pack	5,000	15,000	300,000 / 7,143
C-130A Internal Spray System	3,250	15,000	300,000 / 7,143
BT-67	2,000	10,000	200,000 / 4,762
DC-4	2,000	8,000	160,000 / 3,810
DC-3	1,200	4,800	96,000 / 2,286
BE-90	350	2,800	56,000 / 1,330
Large OSRV	3,000	2,435	48,700 / 1,159
Small OSRV	1,000	1,000	20,000 / 476

c. Other Preparedness Sections.

Other preparedness sections in the Guide discuss:

- U.S. Dispersant Authorization Policies indicating the locations where dispersants are pre-authorized for use and referencing the web sites where the various federal and state governmental agencies list their dispersant policies and procedures.
- Health and Safety Plan guidelines on dispersant specific personal protective equipment, safe practices, aviation safety, etc.
- Coordination of activities between the Air Operations Branch and Dispersant Group.
- Dispersant application system testing and calibration and the development of Spray Dosage Charts for application assets.
- Dispersant spray operations effectiveness monitoring and a description of associated aircraft and vessels.
- Contents of the Dispersant Application After Action Report for a spill response.
- Training and exercise program for Dispersant Group, Incident Management Team, oil spill response organization (OSRO), and the contracted aerial and vessel dispersant assets.
- OSRO auditing procedures for aircraft, vessels and spray systems to ensure they meet regulatory operational requirements.

Operations Section Highlights

The following highlights illustrate the content of the Guide's Operations Section.

a. Offshore Spill Response Objective.

The main objective for responding to an offshore oil spill is to remove as much oil from the surface of the water as quickly as possible to minimize net human and environmental impacts. Delivering this response objective may require simultaneous deployment of several response techniques (mechanical recovery, dispersants use, and in-situ burning) in a manner that results in the most effective concept of response operations. Figure 2 shows an example of the initial concept of operations when applying this approach to an offshore oil spill. The concept of operations would then be modified daily to reflect changes in environmental conditions, oil properties, response strategies, etc.

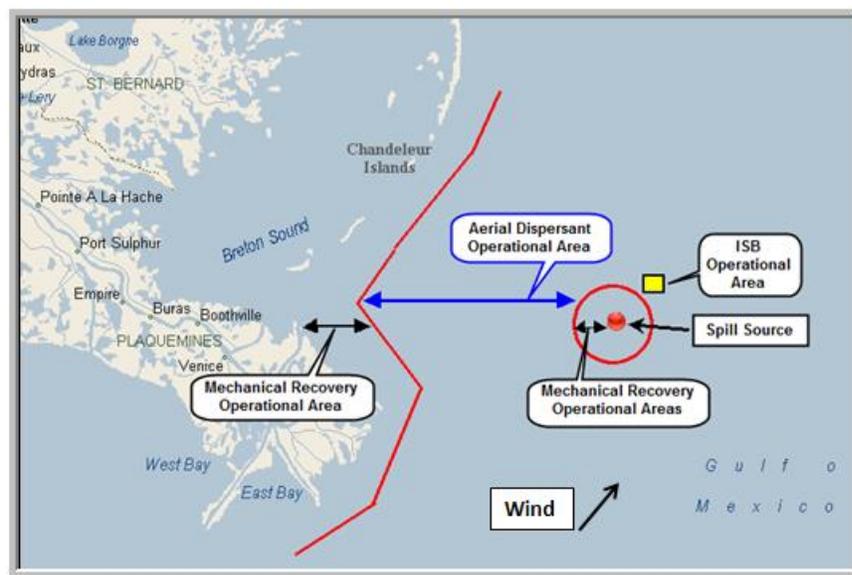


Figure 2. Example of the initial concept of response operations.

b. Staging Airport Selection Criteria for Aerial Dispersant Operations

There are many factors to consider when selecting a staging airport for dispersant operations. Guide discusses requirements for the ramp space, dispersant transfer operations and storage, fuel requirements, and other criteria.

c. Daily Aerial/Vessel Dispersant Application Plan (DADAP)

The DADAP is a critical form documenting dispersants operations. DADAP described in the Guide consists of the following 7 parts:

- Part 1- Statement of government approval for the dispersant operations as described in the following parts of DADAP.

- Part 2 - Dispersant response information including the staging base, spill location, ceiling, visibility and wind forecast, dosage and application information, air/air and air/vessel communications frequencies, and a listing of the available spray, spotter and observer aircraft and vessels.
- Part 3 - Flight and vessel schedule for the operational day including the specific sequence of flights by each aircraft at each staging airport and for each vessel. This section estimates the maximum amount of dispersant that can be applied and amount of oil that can be dispersed during the operational day.
- Part 4 - Activity schedule provides the agenda for commencing and terminating dispersant operations and an agenda of topics to be discussed prior to starting dispersant operations. It also provides basic operational information for the staging base.
- Part 5 - Spill site and staging airport maps showing the location and extent of the oil spill, the aircraft ramp and dispersant transfer area and the location of the staging base operations center.
- Part 6 - Dispersant stockpile logistics plan identifying the dispersant stockpiles that will be activated and when they will arrive at the staging base(s) to ensure that spray aircraft and vessels will have sufficient dispersants available for application.
- Part 7 - Dispersant monitoring plan identifying the aircraft, vessels and personnel that will be involved in monitoring the effectiveness of the dispersant application and how the monitoring will be conducted.

A recommended format for each section of the DADAP is provided in the Guide. The DADAP can and should be scaled and adapted to the response scenario and complexity as well as for use internationally.

d. Other Operations Sections

Other operational sections in the Guide cover:

- Dispersant authorization process
- Dispersant activation and activities checklist
- Initial staging airport supervisor checklist
- Daily dispersant operational flow chart
- Dispersant Group daily activities
- Documentation procedures and standardized forms for recording operations

Conclusions

The Aerial and Vessel Dispersant Preparedness and Operations Guide (API Technical Report 1148) provides company response teams, Oil Spill Response Organizations (OSROs) and government response agencies with proven best practices, procedures, and forms to facilitate preparing for and conducting surface dispersant operations. The Guide can be downloaded free of charge from the API Oil Spill Prevention and Response website (<http://www.oilspillprevention.org>).