U.S. Department of Homeland Security

United States Coast Guard

Special Monitoring of Applied Response Technologies (SMART)
Tactics, Techniques, and Procedures (TTP)

Force Readiness Command (FORCECOM)

CGTTP 3-75.1
22 JUL 2016

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COAST GUARD TACTICS, TECHNIQUES, AND PROCEDURES 3-75.1

Subj: SPECIAL MONITORING OF APPLIED RESPONSE TECHNOLOGIES (SMART)

Ref:
(a) Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006
(b) U.S. Coast Guard Use of Special Monitoring of Applied Response Technology (SMART) Protocols, COMDTINST 16470.1 (series)
(c) U.S. Coast Guard Required Operational Capabilities (ROC) and Projected Operational Environment (POE) for Coast Guard National Strike Force, COMDTINST 3501.57 (series)
(d) U.S. Coast Guard Incident Management Handbook, COMDTPUB 3120.17 (series)
(e) Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115, October 1985
(f) General Description and Discussion of the Levels of Protection and Protective Gear, CFR § 1910.120 Appendix B
(g) Air Operations Manual, COMDTINST M3710.1 (series)
(h) Definitions, 33 CFR § 155.1020
(i) U.S. Coast Guard 26' Trailerable Aids to Navigation Boat (TANB) Operations Handbook, COMDTINST M16534.1 (series)
(j) U.S. Coast Guard Boat Operations and Training (BOAT) Manual Volume I, COMDTINST M16114.32 (series)
(k) U.S. Coast Guard Boat Operations and Training (BOAT) Manual Volume II, COMDTINST M16114.33 (series)
(l) U.S. Coast Guard National Strike Force Standard Operating Procedures, NSFINST M16480.2 (series)
(m) U.S. Coast Guard Personal Property Management Manual, COMDTINST M4500.5 (series)
(n) DustTrak™ DRX Aerosol Monitors Models 8533, 8533EP, and 8534, TSI Incorporated, P/N 6001981, 2014
(o) DustTrak™ DRX Aerosol Monitor Model 8533/8534/8533EP Operation and Service Manual, TSI Incorporated, P/N 6001898, 2014
(p) U.S. Coast Guard Cybersecurity Manual, COMDTINST M5500.13 (series)
(q) SMART Tier 1 Standard Operating Procedures

(r) Monterra™ Quick Start Manual, Garmin, 190-01601-01_0B, 2013
(s) C3 Submersible Fluorometer User's Manual, Turner Designs, P/N 998-2300, 2015
(t) U.S. Coast Guard National Strike Force C3 Fluormeter Operator's Handbook, NSFINST M16470.1 (series)
(u) Hydrolab® DS5X, DS5, and MS5 Water Quality Multiprobes User Manual, Hach Company©, Catalog Number 003078HY, 2006
(v) Marine Safety Manual, Volume IX, Marine Environmental Protection, COMDTINST M16000.14 (series)
(w) Oil Sample Handling and Transmittal Guide, United States Coast Guard Marine Safety Laboratory, Eighth Edition, January 2013
(x) Dispersant Application Observer Job Aid, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service
(y) Open Water Oil Identification Job Aid for Aerial Observation, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, NOAA's National Ocean Service, November 2007
(z) National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR § 300
(aa) Oil Spill Response Vessel Decontamination Examination Tactics, Techniques, and Procedures (TTP), CGTTP 3-72.1 (series)
(bb) Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §1251 et seq. (as amended)
(cc) Contingency Preparedness Planning Manual, Volume III - Exercises, COMDTINST M3010.13 (series)
(dd) Coast Guard After Action Program, COMDTINST 3010.19 (series)
(ee) Performance Improvement Guide, U.S. Coast Guard Leadership Development Center, Fifth Edition, 2006

1. PURPOSE. To provide Special Monitoring of Applied Response Technologies (SMART) team members with Coast Guard tactics, techniques, and procedures (CGTTP) on monitoring the effectiveness of dispersants or the measurement of particulate release during in-situ burns in response to oil spills.

2. ACTION. This CGTTP publication applies to USCG personnel assigned to conduct SMART operations. Internet release is authorized.

3. DIRECTIVES/TTP AFFECTED. None.

4. DISCUSSION. SMART establishes a protocol for rapid collection and reporting of real-time, scientifically based information, in order to assist the Unified Command with decision-making during dispersant and in-situ burn operations in response to oil spills.

5. DISTRIBUTION. FORCECOM TTP Division posts an electronic version of this TTP publication to the CGTTP Library on CGPortal. In CGPortal, navigate to the CGTTP Library by selecting **References > Tactics, Techniques, and Procedures (TTP)**. FORCECOM TTP Division does not provide paper distribution of this publication.

6. FORMS/REPORTS. The forms called for in this publication are available in USCG electronic forms on the standard workstation or on the Internet: http://www.uscg.mil/forms/; CGPortal: Select References from the home page; and Intranet at http://cgweb.comdt.uscg.mil/CGForms.

7. REQUEST FOR CHANGES. Submit recommendations for TTP improvements or corrections through the TTP Request form on CGPortal. In CGPortal, navigate to the TTP Request form by selecting **References > Tactics, Techniques, and Procedures (TTP) > TTP Request**.

   Send lessons learned applicable to this TTP publication via command email to FORCECOM TTP Division at CMD-SMB-CG-FORCECOM.

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Chapter 1: Introduction

Introduction

This tactics, techniques, and procedures (TTP) publication provides guidance for Special Monitoring of Applied Response Technologies (SMART), a protocol for conducting both in-situ burn (ISB) and dispersant monitoring operations. This TTP publication consolidates existing SMART guidance in a single document. Read this TTP publication prior to consulting the individual equipment manuals cited as references.

In This Chapter

This chapter contains the following sections:

Section A: Introduction

A.1. Introduction

The mission of SMART is to provide real-time, scientifically sound information to the National Oceanographic and Atmospheric Administration (NOAA) for ultimate delivery to the incident command or unified command to drive decisions for both current and future dispersant and in-situ burn operations.

This TTP publication serves to assist National Strike Force (NSF) members to perform SMART duties. The NSF comprises active duty, civilian, reserve, and auxiliary personnel and its area of responsibility covers all USCG districts and federal response regions.

A.2. NSF Policy and Directives

The NSF is directed to lead SMART operations and provide direct support to policy and directive per:

- Reference (a), Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.
- Reference (b), U.S. Coast Guard Use of Special Monitoring of Applied Response Technology (SMART) Protocols, COMDTINST 16470.1 (series).
- Reference (c), U.S. Coast Guard Required Operational Capabilities (ROC) and Projected Operational Environment (POE) for Coast Guard National Strike Force, COMDTINST 3501.57 (series).

A.3. Use of Best Practice

Throughout this TTP publication, the term “best practice” is defined as an innovative or modified practice that results in an improved or more effective response.

A.4. Registered Trademark Disclaimer

The use of registered trademarks in this TTP publication is not an endorsement of these products or companies by the United States Coast Guard (USCG), the Department of Homeland Security (DHS), or the Federal government.

A.5. Website for SMART TTP Publication References and Resources

For hyperlinks to reference and resource documents cited in this TTP publication, go to the NSF SMART CGPortal website.

This website contains a list titled "SMART TTP reference links." This list comprises hyperlinks to reference documents cited in this TTP publication.

This website also contains a list of documents cited throughout this TTP publication as "Resources for Further Reading." These hyperlinks are organized by TTP publication chapter and the order of citation. Some of these websites require the user to either browse to a secondary link or download the desired document.

NOTE: **Some hyperlinks from the NSF's website produce an error due to USCG internet security. If this occurs, follow the workaround instructions posted.**

NOTE: **The hyperlinks provided on the NSF's website were active at the time of this TTP publication's release, but they may be updated or deleted over time. Contact the originator or search the internet to ensure you have the most recent version of a link or to find a website that is no longer active.**

NOTE: **If you have a problem accessing a hyperlink on the NSF's website or need to report a correction, click "Contact Us" to make a comment.**

Section B: Notes, Cautions, and Warnings

B.1. Overview The following definitions apply to notes, cautions, and warnings found in TTP publications.

NOTE: **An emphasized statement, procedure, or technique.**

CAUTION: **A procedure, technique, or action that, if not followed, carries the risk of equipment damage.**

WARNING: ***A procedure, technique, or action that, if not followed, carries the risk of personnel injury or death.***

Chapter 2:
Planning and Mobilization

Introduction

This chapter discusses considerations and provides guidelines to plan and mobilize for SMART operations.

In This Chapter

This chapter contains the following sections:

Section A: Pre-mission Planning

A.1. SMART in the Incident Command System Structure

A Federal On-Scene Coordinator (FOSC) appointed to lead an environmental response manages SMART operations under the Incident Command System (ICS) per reference (d), U.S. Coast Guard Incident Management Handbook, COMDTPUB P3120.17 (series). The ICS Incident Command Post performs primary, tactical-level, and on-scene incident command functions at a designated location for each mission.

The NSF typically provides personnel to fill positions within the ICS Operations Section. The SMART Monitoring Group Supervisor directs and coordinates operations and reports to the ICS Operations Section Chief. The number of participants can vary. The NSF is organized into visual, air, and water column monitoring teams for SMART operations. Each team comprises a monitor and assistant monitor.

A.2. SMART Organization and Reporting Structure

Although the SMART Monitoring Group is organized under the ICS Operations Section, personnel send collected data to the designated technical specialist or the environmental unit in the ICS Planning Section (typically the NOAA Scientific Support Coordinator (SSC)) per reference (a), Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006. SSCs and other similar technical specialists are qualified to analyze, interpret, and make recommendations based on the data collected.

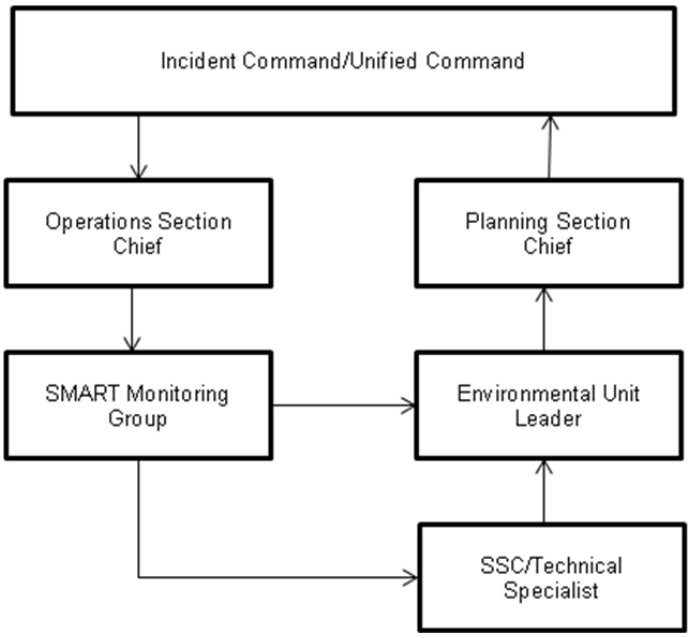

Figure 2-1 SMART Monitoring Group organization and reporting structure

Section B: Equipment Selection

B.1. Introduction

The severity, complexity, and expected duration of an incident dictate the equipment selected for the response. Anticipate that each incident is inherently different from others and expect the status to continually change during response operations. Best practice recommends that responders deploy with equipment exceeding the initial monitoring needs.

B.2. Personal Protective Equipment

Use personal protective equipment (PPE) per reference (e), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115, October 1985.

Select PPE to protect SMART personnel from the specific hazards they are likely to encounter on site per reference (f), General Description and Discussion of the Levels of Protection and Protective Gear, CFR § 1910.120 Appendix B.

NOTE: **SMART personnel should retain awareness of the incident's health and safety plan and periodically evaluate PPE as the mission progresses.**

B.3. Standard SMART Equipment

Standard SMART equipment includes:

- C3™ Submersible Fluorometer.
- Digital camera.
- DustTrak™ aerosol monitor.
- Global Positioning System (GPS) navigator.
- GO-FLO water sampler.
- Hydrolab® Multiprobe.
- Non-standard laptop.
- Self-locating datum marking buoy (SLDMB).

B.4. Communications Requirements and Limitations

In the absence of a USCG-issued, portable offshore communications device on a vessel of opportunity (VOO), seek to obtain contingency communications equipment. The SMART Monitoring Team on the VOO needs to communicate freely with the aerial observer. This recognized communications gap can be remedied with an appropriate aviation radio.

The high frequency (HF) patch is a communications option commonly used in high geographic latitudes. This patch allows for sustained communications with an offshore asset. Responders conduct a phone patch with USCG Communications Command (COMMCOM).

Iridium satellite phones provide an option for either secure or non-secure communication depending on the responders need. Contact COMMCOM for inventory availability.

Software-defined radios can be acquired for a variety of communications needs. The current contingency radio is the Harris Unity 100 tri-band radio that offers very high frequency (VHF), ultra high frequency (UHF), and the lower side of the HF spectrum. COMMCOM will assist in selecting either the PRC-152a or the PRC-117g radio. Contact COMMCOM to obtain information on ordering communications equipment for SMART operations.

B.5. Power Equipment for Deployment

The NSF has portable generators available (e.g., 1 to 10.5 kilowatts) for deployment with SMART equipment. Power equipment support recommendations for SMART teams include:

- At least a 1-kilowatt generator for charging/powering equipment in the field.
- Extension cords and surge suppressors for the generator.
- Consider requirements for consumables such as gasoline and engine oil.
- 1000-watt, 12-volt inverters for charging and powering equipment in the field with vehicles.

B.5.a. Power Equipment for Overseas Travel

NSF teams traveling overseas should consider converting the European 240-volt to United States 110-volt. Some teams have a 1000- and 1500-watt converter (converts European 240-volt to United States110-volt). Some power adapters such as computer power adapters can take 110-volt and 240-volt, but require a plug adapter. Best practice recommends taking a variety of plug adapters for overseas deployment.

Section C: Aircraft Resources

C.1. Aircraft of Opportunity Selection

NSF responders require air assets during SMART operations. Aircraft capability provides necessary aerial observation that informs the on-water monitoring team where to look for dispersed oil and photo documents the progress of the operation. For ISB operations, aircraft capability bolsters monitoring efforts and allows for a good grasp of the operational picture.

The party responsible for the mission typically selects an aircraft of opportunity from the response resource inventory through the ICS structure with the input of NSF responders. Keep in mind that USCG aircraft can be diverted to higher priority missions, are more expensive to operate, and generally have less availability that contracted aircraft. Adhere to the policy for contracted aircraft per reference (g), Air Operations Manual, COMDTINST M3710.1 (series).

NOTE: **Limit flights over water using single-engine, single-piloted aircraft (fixed or rotary) to daytime and visual flight rules.**

C.1.a. Long-range Surveillance Aircraft

The USCG's long-range surveillance capability and provisions for heavy air transport include NSF movements. For the most complete and current information, browse to the NSF SMART CGPortal website under "Resources for Further Reading."

C.1.a.(1). HC-130H Hercules

The HC-130H Hercules maintains the capability for aerial delivery of dispersant through the Aerial Delivery Dispersant System at Air Stations Barbers Point, HI and Kodiak, AK.

Figure 2-2 HC-130H Hercules

Capabilities and Features	
Range: 3500 nautical miles (NM)	Video recording equipment
Average speed: 280 knots	Night vision goggle (NVG) capability
Maximum endurance: 14.5 hours	
Communications and Sensors	
Multimode surface search radar	Automatic identification system (AIS)
Wescam MX-20 electro-optical (EO)/ infrared (IR)	VHF/frequency modulation (FM)
	UHF/amplitude modulation (AM)
APS-125 weather radar	HF
DF-430 UHF/VHF direction finder system	Military satellite communication (MILSATCOM)
	Rescue 21 radios
	Iridium

Table 2-1 HC-130H Hercules capabilities, features, communications, and sensors

C.1.a.(2). HC-130J Super Hercules

The HC-130J is a four-engine, turboprop military transport aircraft.

Figure 2-3 HC-130J Super Hercules

Capabilities and Features	
Range: 4900 NM	Video recording equipment
Average speed: 320 knots	NVG capability
Maximum endurance: 20 hours	
Communications and Sensors	
Multimode (synthetic aperture radar/ inverse synthetic aperture radar/search) surface search radar	DF-430 UHF/VHF direction finder system
	L-3airborne AIS
	VHF/FM, UHF/AM, and HF
APN-241 low power weather radar	MILSATCOM
EO/IR forward-looking infrared radar (FLIR) Systems Star Safire III	Rescue 21 radios
	Inmarsat

Table 2-2 HC-130J Super Hercules capabilities, features, communications, and sensors

C.1.b. Medium-range Surveillance Aircraft

The medium-range surveillance aircraft inventory are for medium-range air transport including maritime safety and security team, port security unit, and NSF movements. Roles include search and rescue, law enforcement, and environmental protection. For the most complete and current information , go to the NSF SMART CGPortal website.

C.1.b.(1). HC-144A/B Ocean Sentry

The HC-144A/B Ocean Sentry is a twin-engine aircraft.

Figure 2-4 HC-144A/B Ocean Sentry

Capabilities and Features	
Range: 2100 NM	Video recording equipment
Average speed: 215 knots	NVG capability
Maximum endurance: 10.5 hours	
Communications and Sensors	
Multimode surface search radar	VHF/FM, UHF/AM, and HF
EO/IR-FLIR systems Star Safire III	MILSATCOM
AIS	Inmarsat
DF-430 UHF/VHF direction finder system	Rescue 21 radios

Table 2-3 HC-144A/B Ocean Sentry capabilities, features, communications, and sensors

C.1.b.(2). HC-27J Spartan

The HC-27J is a twin-engine aircraft and is not currently configured with traditional sensor system suites.

Figure 2-5 HC-27J Spartan

Capabilities and Features	
Range: 2675 NM	APN-241 low-power weather radar, capable of ground mapping, with limited surface detection
Average speed: 290 knots	
Maximum endurance: 12 hours	
	NVG capability
Communications and Sensors	
VHF/FM, UHF/AM, and HF	Inmarsat
MILSATCOM	Rescue 21 radios

Table 2-4 HC-27J Spartan capabilities, features, communications, and sensors

C.1.b.(3). MH-60T Jayhawk

The MH-60T Jayhawk is a twin-engine, single-rotor aircraft that serves as the USCG's medium-range surveillance helicopter. It is designed for short range missions with potential to extend offshore range through offshore fueling platforms and cutters with an operational flight deck. The aircraft is capable of in-flight refueling from major cutters and can land on some USCG assets, but cannot be hangared on them. The MH-60T lacks data link communications equipment, constraining its ability to communicate with other USCG, DHS, and Department of Defense assets.

Figure 2-6 MH-60T Jayhawk

Capabilities and Features	
Range: 700 NM	Hoist system rated to 600 pounds with capability to provide limited first aid to rescued persons
Cruise speed; 120 knots	
Maximum endurance: 6 hours	
All-weather, day and night capable	NVG capable
Communications	
VHF/UHF AM and VHF-FM	MILSATCOM (voice/data)
HF/automatic link establishment (ALE), direction finder (DF)/automatic direction finder (ADF)	Rescue 21 radios
	Search/weather radar

Table 2-5 MH-60T Jayhawk capabilities, features, and communications

C.1.c. Short-range Recovery Helicopter

For the most current and complete information on the short-range recovery helicopter, browse to the NSF SMART CGPortal website under "Resources for Further Reading."

C.1.c.(1). MH-65 Dolphin

The MH-65 Dolphin is an all-weather, twin-engine, single rotor aircraft with a crew of four that performs and supports all USCG missions in the inland, coastal, and offshore zones. The MH-65 is most suited as an aviation prosecution asset while operating either from land or the USCG's medium and high endurance cutters.

MH-65s are designed for short-range missions with potential to extend offshore range through offshore fueling platforms and cutters with an operational flight deck. The limited endurance and radius of action give the MH-65 limited effectiveness for land-based operations. The weather radar can be used for larger target searches, but is less effective for locating small targets. The EO/IR turret provides infrared detection and low-light optical reconnaissance and search capability.

Figure 2-7 MH-65 Dolphin

Capabilities and Features	
Range: 300 NM	NVG compatible and equipped with a heads-up display
Cruise speed: 120 knots	
Maximum endurance: 3 hours	
Communications	
VHF/UHF AM and VHF-FM	DF/ADF
HF/ALE, search/weather radar (can be used to detect oil sheens through ground mapping)	MILSATCOM (voice/data)
	Rescue 21 radios

Table 2-6 MH-65 Dolphin capabilities, features, and communications

C.2. USCG Aircraft Operating Parameters

Conduct SMART air operations per reference (a), Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.

Adhere to policy, standards, instructions, and capabilities pertinent to all phases of USCG flight operations per reference (g), Air Operations Manual, COMDTINST M3710.1 (Series).

For more information, browse to NOAA's Dispersant Application Observer Job Aid cited under "Resources for Further Reading" on the NSF SMART CGPortal website.

Section D: Vessel Resources

D.1. Vessel of Opportunity Selection

A vessel of opportunity (VOO) is a vessel engaged in spill response activities that is normally and substantially involved in activities other than spill response per reference (h), Definitions, 33 CFR § 155.1020. VOOs can be contracted for the duration of an event or spill.

VOOs are necessary for mission execution. The selection of an appropriate vessel must account for the projected operating environment. The operations section chief typically determines the appropriate asset, but responders can provide critical input to assist with the selection process. The following sections provide the minimum needs and considerations for NSF responders to prepare for both in-situ burn and dispersant monitoring.

D.1.a. Vessel Selection for In-situ Burn Operations

SMART may not require a vessel for ISB operations. If a vessel is needed, the operations section chief chooses the appropriate vessel based on considerations including:

- Distance offshore.
- Ability to comfortably carry a minimum of two passengers.
- Expected number of burns.
- Proximity to population center.
- Navigation package compatible to the USCG's Scalable Integrated Navigation System package in order to input/establish waypoints, transit pre-determined routes, etc.
- Weather monitoring equipment to attain air/water temperature, wind speed, and direction.

D.1.b. Vessel Selection for Dispersant Operations

Dedicated vessels capable of maintaining a constant speed of 1 to 5 knots are required to maintain an appropriate testing depth (1 to 10 meters) for SMART dispersant operations. Most vessels perform satisfactory as platforms for dispersant monitoring. SMART equipment is relatively small and requires minimal deck space.

Fluorometry kits comprise a self-sufficient package, but certain vessel characteristics provide greater benefit. Prerequisites for selecting a VOO for dispersant operations include:

- Able to traverse at approximately 1 knot to tow monitoring equipment at desired depth.
- A minimum of 25 square feet deck space that allows the set up of monitoring equipment.

- Space to carry a minimum of two passengers to run the monitoring equipment.
- Internet access to enable real-time data distribution to shore.
- A full suite of communication equipment that provides the ability to communicate with aircraft, vessels, shore communications, and shore units.
- Ample size and type of vessel for expected sea state and expected distance off shore.
- Equipment including a davit or a device that allows the monitor to be lowered into the waterway from the side of the vessel minimizing the risk of propeller entanglement.
- Navigation package compatible to the USCG's Scalable Integrated Navigation System package in order to input/establish waypoints, transit pre-determined routes, etc.
- Weather monitoring equipment to attain air/water temperature, wind speed and direction.
- Low freeboard.

D.2. Requesting a Vessel

If the ICS is in place, complete a General Message (Form ICS 213) or a Resource Request Message (Form 213-RR-CG) and submit it to the operations section chief for approval. The NSF SMART CGPortal website provides hyperlinks to these forms.

If the ICS is not established, follow established guidance for ordering resources.

When requesting a vessel, confirm you have an accessible boat launch identified with an appropriate depth of water for the boat's draft. When requesting a larger vessel such an offshore vessel, confirm there is a pier that can support the vessel, i.e., draft, bollards, loading/offloading of passengers and gear, etc., and ensure arrangements are made with the dockmaster.

D.3. Vessel Options

The following sections detail vessel options at the NSF.

D.3.a. Trailerable Aids to Navigation Boat

This boat is designed primarily to service aids to navigation within the inland waters of the United States. See reference (i), U.S. Coast Guard 26' Trailerable Aids to Navigation Boat (TANB) Operations Handbook, COMDTINST M16534.1 (series), for specifications and operation instructions.

Figure 2-8 Trailerable aids to navigation boat

D.3.b. 18-foot Jon Boat

A jon boat is a flat-bottomed boat constructed of aluminum, fiberglass, or wood with one, two, or three bench seats. The hull of a jon boat is nearly flat, therefore it tends to ride over the waves rather than cut through them as a V-hull might, thus limiting the use of the boat to calmer waters. Jon boats typically have a transom that provides mounting for an outboard motor.

Figure 2-9 18-foot jon boat

D.4. USCG Vessel Operating Parameters	Use appropriate procedures for SMART vessels including reference (j), U.S. Coast Guard Boat Operations and Training (BOAT) Manual Volume I, COMDTINST M16114.32 (series) and reference (k), U.S. Coast Guard Boat Operations and Training (BOAT) Manual Volume II, COMDTINST M16114.33 (series).

Section E: Logistics and Deployment

E.1. Equipment Logistics and Supply Considerations

NSF members should meet before deployment to discuss mission considerations and relevant policy per reference (l), U.S. Coast Guard National Strike Force Standard Operating Procedures, NSFINST M16480.2 (series).

Download a Requisition and Invoice/Shipping Document (Form DD-1149) for property transfer. The NSF SMART CGPortal website maintains a hyperlink to this form under "Resources for Further Reading."

Complete and submit this form per reference (m), U.S. Coast Guard Personal Property Management Manual, COMDTINST M4500.5 (series).

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Chapter 3:
In-situ Burn Monitoring Operations

Introduction

This chapter provides a description of the particulate monitor used by the SMART team, guidance to conduct aerial photography, and procedures to collect and report data during ISB operations. For an overview of ISB monitoring procedures, see reference (a), Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.

Adhere to safety requirements per reference (e), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115, October 1985.

For more information on ISB including downloads of spill response reports, browse to NSF SMART CGPortal website under "Resources for Further Reading."

In This Chapter

This chapter contains the following sections:

Section A: DustTrak™ Aerosol Monitor

A.1. Equipment Description

The DustTrak DRX Aerosol Monitor 8533 manufactured by TSI Incorporated is a laser photometer that simultaneously measures five size-segregated mass concentrations at once corresponding to particulate matter (PM) levels PM1, PM2.5, reparable, PM10, and total PM fractions. The DustTrak combines both particle cloud (total area of scattered light) and single particle detection to achieve mass fraction measurements.

See reference (n), DustTrak™ DRX Aerosol Monitors Models 8533, 8533EP, and 8534, TSI Incorporated, P/N 6001981, 2014 , TSI Incorporated, P/N 6001981, 2014 for a detailed equipment description.

For complete specifications, browse to the manufacturer's website cited on the NSF SMART CGPortal website under "Resources for Further Reading."

Figure 3-1 DustTrak aerosol monitor

A.2. Assembly for Deployment

Assemble the monitor for deployment as shown in the following figure.

Figure 3-2 Aerosol monitor field kit

A.3. Set up, Operation, Maintenance, and Troubleshooting

Conduct monitor set-up, maintenance, operation, and troubleshooting per reference (n), DustTrak™ DRX Aerosol Monitors Models 8533, 8533EP, and 8534, TSI Incorporated, P/N 6001981, 2014, TSI Incorporated, P/N 6001981, 2014.

NOTE: **The following section describes specific steps not described in the appropriate order in reference (n). Perform the steps in this order to correctly operate the equipment.**

A.4. Data Collection

The DustTrak provides automated data collection and generation of summary reports of the data readout. The data summary report provides high and low readings, time-weighted average, PM2.5, PM10, and other information for the SSC. Calibrate each DustTrak unit to the operating environment before beginning data collection per reference (n).

NOTE: **Failure to properly calibrate the unit causes it to produce readings with negative numbers. Remedy by recalibrating the equipment.**

After calibrating the monitor, set up the DustTrak to begin collecting background data one hour prior to beginning burn operations. To collect background data, place the DustTrak in run mode for a 10-second log interval. The DustTrak can either run for a pre-set time or can be manually set to be turned on and off by the user. Use the run mode that best suits the situation.

NOTE: **Operating the DustTrak when relative wind conditions exceed 22 miles per hour can decrease sampling efficiency and result in slightly lower readings.**

CAUTION: **Never use batteries other than the rechargeable 6600-milli-ampere hour lithium ion battery prescribed by the manufacturer.**

NOTE: **During use, contaminants become lodged in the machine's intake. Use an electronics dust blower to clean out the aerosol inlet after use.**

After the ISB operation is complete, allow 20 to 30 minutes before capturing post-operation background data. Either stop the data collection manually or allow it to time out, based on how the run was set up initially.

Plug the non-standard laptop computer into the DustTrak and follow the instructions for transferring data from the DustTrak to the computer per reference (o), DustTrak™ DRX Aerosol Monitor Model 8533/8534/8533EP Operation and Service Manual, TSI Incorporated, P/N 6001898, 2014.

Email the collected data to the SSC and copy team members responsible for compiling case documentation.

A.5. Field Reporting

NSF teams generally report via verbal debrief, data downloads from monitoring instruments, and hard copy reports. Coordinate field reporting with the ICS Scientific Support Team. Document reporting per Attachment 8, ISB Monitoring Recorder Sheet of reference (a), Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.

Section B: Photography

B.1. Review Photography Fundamentals

Review the photography resources cited on the NSF SMART CGPortal website for instruction ranging from the beginning to the advanced level of expertise.

B.2. Photography Security

Adhere to photography security requirements per reference (p), U.S. Coast Guard Cybersecurity Manual, COMDTINST M5500.13 (series).

NOTE:

Only use a government-issued camera. The pictures taken during a case are often used for evidence. Using your personal camera or phone camera to take pictures can result in law enforcement confiscating your electronic devices for evidence.

B.3. Photography During Operations

Once on scene, photo document the area of interest per reference (q), SMART Tier 1 Standard Operating Procedures. This document provides methods of collecting photos and examples of data reporting forms.

Photograph the GPS coordinates of the current location and take observation photographs. Repeat this process for each picture for use in the photo log.

Before takeoff, call or text the SMART Group Supervisor for accountability purposes. Once situated in the aircraft, take a picture of date and time as displayed on the operational display. This synchronizes the time/date stamp on the camera with the operational track lines for use in the Geographic Information System.

Once in flight, request the pilot to keep the sun behind the aircraft for best viewing and maintain an altitude of 500 to 1,000 feet (150 to 300 meters) while you observe the slick at about a 30-degree angle.

NOTE:

Observation is especially difficult under low-contrast conditions such as twilight or haze.

Once the flight mission is complete, return to the airport, notify the SMART Group Supervisor that you have landed, and be ready to receive further instruction.

B.4. Best Practice Photography Guidance and Techniques

For best practice guidance on aerial photography of oil spills, download the following resources cited under "Resources for Further Reading" on the NSF SMART CGPortal website: Aerial Observation of Oil Spills at Sea and Standard Practice for Reporting Visual Observations of Oil on Water. Use best practice techniques per the following figure.

PRE-FLIGHT

Gear list
- Safety gear (e.g. HEED, vest, etc.)
- Clipboard or kneeboard
- Basemap, pencil, pen
- Camera
- GPS
- Notepad
- Sunglasses
- Job aid
- Identification

Pre-flight actions
- Pre-flight briefing topics
  - Flight objectives(s)
  - Proposed flight path
  - Altitude
  - Speed
  - Observer seat (visibility, sun/glare)
  - Look angle (relative to horizon)
- Receive aircraft safety brief

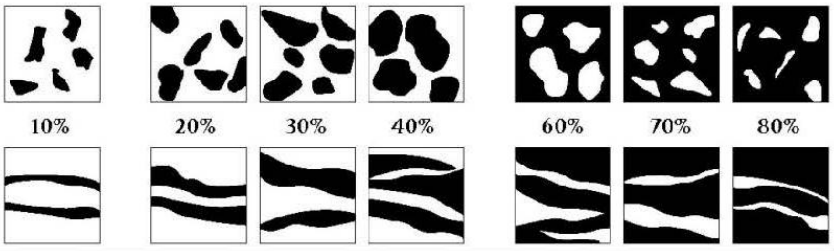
IN-FLIGHT ACTIONS

GPS set-up
- Ensure good signal reception
- Clear tracklog
- Take photo of GPS time (down to the second)

Notes & photos
- Flight path & altitude
- Oil location, boundaries & dimensions
- Oil descriptors (e.g. distribution, color, % coverage)
- Where is recoverable oil? (include location and/or photo)
- Wildlife (location, type & abundance)
- Operational assets (e.g. response vessels, skimmers, etc.)
- Possible false positives
- Winds, visibility, sea state & oceanographic features
- Areas not observed (if mission not completed)

Colors (Code)	**Structure/distribution (code)**
Silver Sheen (S)	Streamers (st)
Rainbow (R)	Convergence Line (co)
Metallic (M)	Windrows (wr)
Transition (T)	Patches (pa)
Dark (D)	Tarballs (tb)
Emulsion (no code)	No Structure (ns)

% COVERAGE



POST-FLIGHT ACTIONS
- Verify note completeness
- Verify & download photos & trackline
- Brief Operations, Situation, SSC, Tech Specialists (trajectory, wildlife, etc.)
- Ensure proper transfer of overflight data to Data Manager
- Ensure accurate product creation (e.g. maps, figures)

Figure 3-3 Aerial observer checklist

B.5. Flight Data Documentation and Reporting

Collect and report flight data per the following table.

Report Type	Source/Report Format	Data Format/File Name Convention
Unit Log, ICS-214	Source: Unit Log, Form ICS 214-CG. Format: Reference (q), SMART Tier 1 Standard Operating Procedures.	Format: Year/month/day (YYYYMMDD) Save as: SMART Air Team 1 1CS214.doc
Photo Log	Source and format: Reference (q).	Format: YYYYMMDD Save as: "SMART Air Team 1 Photo Log.doc"
Photos	Source: Conventional, digital, and video photos. Format: Joint Photographic Experts Group (JPEG).	Save photos as listed when uploaded, thereby ensuring automatic sequential numbering.
ISB Monitoring Recorder Reporting Sheet	Source and format: Attachment 8, ISB Monitoring Reporting Sheet of reference (a), Special Monitoring of Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.	Save as: "SMART Air Team 1 ISB Monitoring Observation Reporting Form.doc"

Table 3-1 Flight data reporting for in-situ burn operations

Save data to the hard drive for the SSC and to the hard drive for the NSF case file. Copy the day's logs and photos to the secondary portable hard drive and deliver to the technical specialist for analysis.

B.6. Video Cameras

Video cameras are not standard SMART inventory equipment. The SMART team can choose to use them in cases where video recordings benefit the quality of reported data. Discuss video data standards with the SSC prior to deployment. Include minimum megapixel, zoom, GPS, how to perform geotagging, and how to download the GPS tracks and videos for geotagging each photo.

B.7. Digital Camera

Use a digital camera with basic capabilities such as video, high-resolution of 11 megapixels or greater, removable media storage (such as secure digital card), image stabilization, 30X zoom, autofocus, and ruggedized and battery life sufficient to last more than 200 photos. Operate the camera per the manufacturer's instructions and specifications.

B.8. Garmin Monterra Global Positioning System Navigator

The Garmin Monterra™ is a Wi-Fi® enabled GPS navigator that combines mapping capability. Set up and operate the equipment per reference (r), Monterra™ Quick Start Manual, Garmin, 190-01601-01_0B, 2013. For product specifications, browse to the manufacturer's website cited on the NSF SMART CGPortal website.

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Chapter 4:
Dispersant Monitoring Operations

Introduction

This chapter provides procedures for the use of equipment and photography for SMART dispersant monitoring operations.

For an overview of dispersant monitoring procedures, see reference (a), Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.

In This Chapter

This chapter contains the following sections:

Section A: Turner C3™ Submersible Fluorometer

A.1. Equipment Description

The C3 Submersible Fluorometer manufactured by Turner Designs, Inc. has a factory-installed temperature sensor and can be configured with one, two, or three optical sensors ranging from the deep ultraviolet to the infrared spectrum. Internal memory storage capacity combined with an external submersible lithium ion battery allows the device to run during either extended or short-term deployments.

Figure 4-1 Turner C3 Submersible Fluorometer

A.2. Equipment Set up and Software Installation

Follow instructions regarding equipment set up and instructions for software installation and operation per reference (s), C3 Submersible Fluorometer User's Manual, Turner Designs, P/N 998-2300, 2015, and reference (t), U.S. Coast Guard National Strike Force C3 Fluorometer Operator's Handbook, NSFINST M16470.1 (series).

No.	Description	No.	Description
1	Six-part folder with logs	15	Alcohol wipes
2	C3 Fluorometer Operator's Handbook	16	Shackles
3	C3 Fluorometer User's Manual	17	Locking pins with retainer
4	Installation compact discs	18	C3 12-volt power cable
5	Toughbook 110-volt power cable	19	Zip ties
6	Yellow extension cord, 50-foot	20	C3 ultraviolet shade cap
7	Panasonic toughbook	21	C3 12-volt power cable outlet
8	Toughbook 12-volt power cable	22	Turner C3 sensor
9	Terminal clamp 12-volt outlet	23	C3 110-volt power cable
10	Tending line	24	Distilled water
11	Interface cable	25	C3 carrier vehicle
12	Dual-outlet 12-volt splitter	26	Data cable booster with pigtail (long)
13	Tool kit	27	Data cable booster with pigtail (short)
14	Black data cable, 25 meter		

Figure 4-2 Fluorometer kit contents

A.3. Assembly for Deployment

Properly assemble and pack the field kit materials per the following figure.

Figure 4-3 Fluorometer kit assembly

A.4. Equipment Operation

Operate the equipment per reference (t), U.S. Coast Guard National Strike Force C3 Fluormeter Operator's Handbook, NSFINST M16470.1 (series).

NOTE:

Before deploying the C3 over the vessel's stern, ask the vessel operator to place the throttles in reverse and apply enough power to clear any oil off the surface. Then, lower the C3 into the clearing in the water's surface. Skipping this step can contaminate the sensors before data collection begins.

A.5. Data Collection and Field Reporting

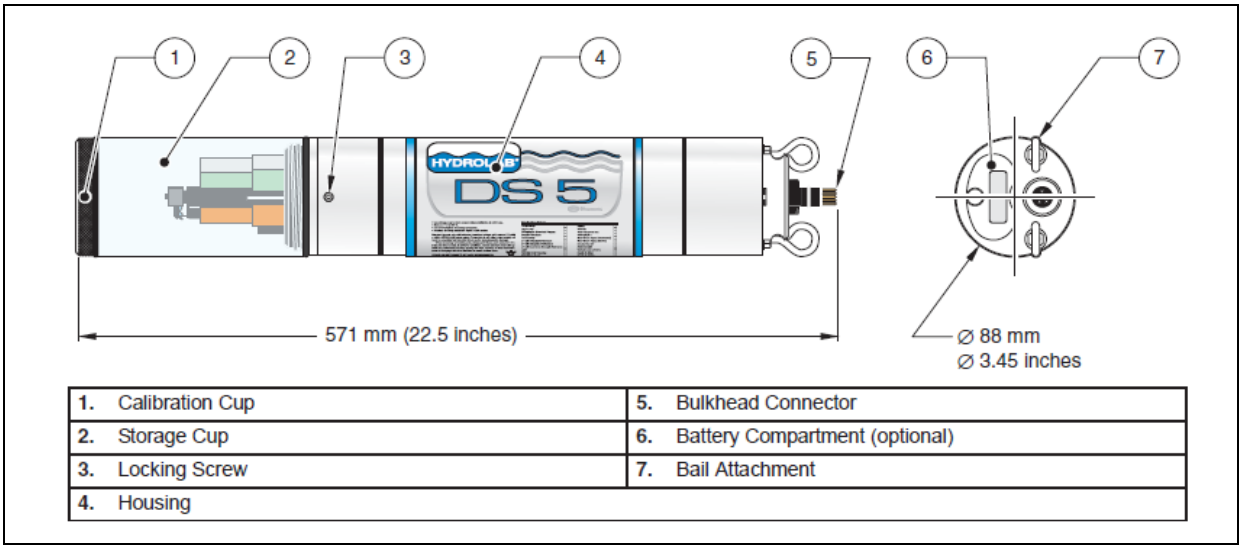
Conduct data collection and field reporting per reference (t).

Section B: Hydrolab® Multiprobe

B.1. Equipment Description

The Hydrolab DS 5 Multiprobe is designed for water sampling. It can measure up to 15 parameters simultaneously and has seven configurable ports that can detect up to ten selected sensors.

Figure 4-4 Hydrolab DS 5 Multiprobe



1. Calibration Cup	5. Bulkhead Connector
2. Storage Cup	6. Battery Compartment (optional)
3. Locking Screw	7. Bail Attachment
4. Housing	

Figure 4-5 Multiprobe configurable ports

B.2. Equipment Set up and List

For equipment features and set up instructions, see reference (u), Hydrolab® DS5X, DS5, and MS5 Water Quality Multiprobes User Manual, Hach Company©, Catalog Number 003078HY, 2006. For a list of equipment, see the following table.

DS5 multiprobe with connector cover	Surveyor
Calibration cap	Power cord and international adapters
Weighted sensor guard	HYDRAS 3 LT software compact disc
CR-2032 batteries	Instruction sheet for the self-cleaning turbidity sensor
Instruction sheet for luminescent dissolved oxygen sensor	Surveyor manual
Hydrolab DS5 manual	HYDRAS 3 LT manual
50-foot cable with connector cover	4-pin serial cable
9-pin serial cable	Turbidity kit: Allen wrench, (4) wiper blades with set screws (2)
Silicone compound	(4) 80-milimeter O-rings
(4) 20-milimeter O-rings	Material safety data sheets
Teflon™ junction, part number 000548HY	Potassium chloride salt pellets, part number 005376HY
pH reference electrode-saturated potassium chloride and Silver chloride	Instruction sheet for pH salt pellets

Table 4-1 Hydrolab equipment list

NOTE: **Calibrate the device at the unit and prior to getting underway to ensure the equipment is functioning properly.**

CAUTION: **The muliprobe will not work unless you follow the steps in the exact order per reference (u). Do not deviate from this order.**

B.3. Data Collection

Collect data per reference (u).

B.4. Field Reporting

Collect relevant data into an Excel spreadsheet (.xls), save it, and email it to the NOAA SCC. Specify the date/time collected, who conducted the sampling, and the latitude/longitude of the location.

Section C: GO-FLO Water Sampler

C.1. Product Description

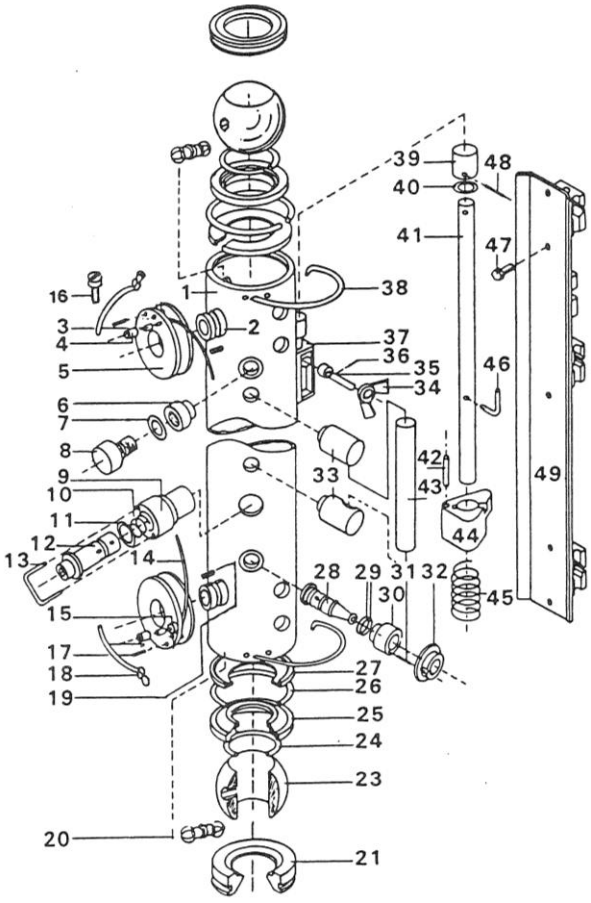
The Model 1080 GO-FLO Water Sampler manufactured by General Oceanics, Inc. features a close-open-close operation. The bottle opens automatically (hydrostatic pressure activated) at approximately 10 meters (33 feet), then flushes until closed by standard GO Devil messenger individually, serially, or sequentially by remote command with a model 1015 Rosette® multi-bottle array, or with model AR1015 acoustic command control. Inert gas can be injected into the bottle to force the retrieved sample out of the sampling valve, directly through filter system.

The GO-FLO avoids sample contamination at the surface, internal spring contamination, loss of sample on deck (internal seals), and exchange of water from different depths. For more information, browse to the manufacturer's product information and specifications cited under "Resources for Further Reading" on the NSF SMART CGPortal website.

Figure 4-6 GO-FLO water sampler

C.2. Equipment Breakdown and Parts List

The following figure provides an equipment breakdown and parts list for the GO-GLO.



ITEM	DESCRIPTION	QT.
1	BODY	1
2	PULLEY BUSHING	2
3	1/8 NICROPRESS SINGLE HOLE	2
4	HEAT SHRINK	2
5	SPRING PULLEY	2
6	BUSHING. PRESSURE A/VENT.	1
7	"O" RING 81-0395	1
8	A/VENT & PRESSURE VALVE	1
9	PRESSURE VALVE BUSHING	1
10	SPRING	1
11	"O" RING 81-0025	1
12	PRESSURE VALVE	1
13	"U" BRACKET	1
14	LANYARD 1/8	1
15	FLAT WASHER	2
16	SCREW	4
17	ROLL PIN .12x1.0	2
18	RUBBER SPRING	1
19	ANCHOR PIN	2
20	BALL KEY	2
21	BALL ENTRAPMENT	2
22	"O" RING	2
23	SEALING BALL	2
24	"O" RING	2
25	FLOATING SEAL	2
26	"O" RING	2
27	SILICONE SEAL	2
28	VALVE BODY. PETCOCK.	1
29	"O" RING PETCOCK.	2
30	BUSHING. PETCOCK.	1
31	LOCK PIN. PETCOCK.	1
32	PULL DISC. PETCOCK.	1
33	HANDLE POST	2
34	WING NUT	3
35	WIRE CLAMP BOLT	3
36	ROLL PIN .12x.5	3
37	BLOCK P.V.C.	3
38	LOCKING LANYARD	2
39	PUSH ROD CAP	1
40	"O" RING 81-0395	1
41	PUSH ROD	1
42	RELEASE PIN "1"	1
43	CARRYING HANDLE	1
44	THUMB BLOCK	1
45	PUSH ROD SPRING	1
46	RELEASE PIN "L"	1
47	MTG. BLOCK BOLT	5
48	ROLL PIN. PUSH ROD	1
49	MTG. WELDMENT	1

Figure 4-7 GO-FLO equipment breakdown and parts list

C.3. Assembly for Operation

Assemble the GO-FLO for operation per the following figure.

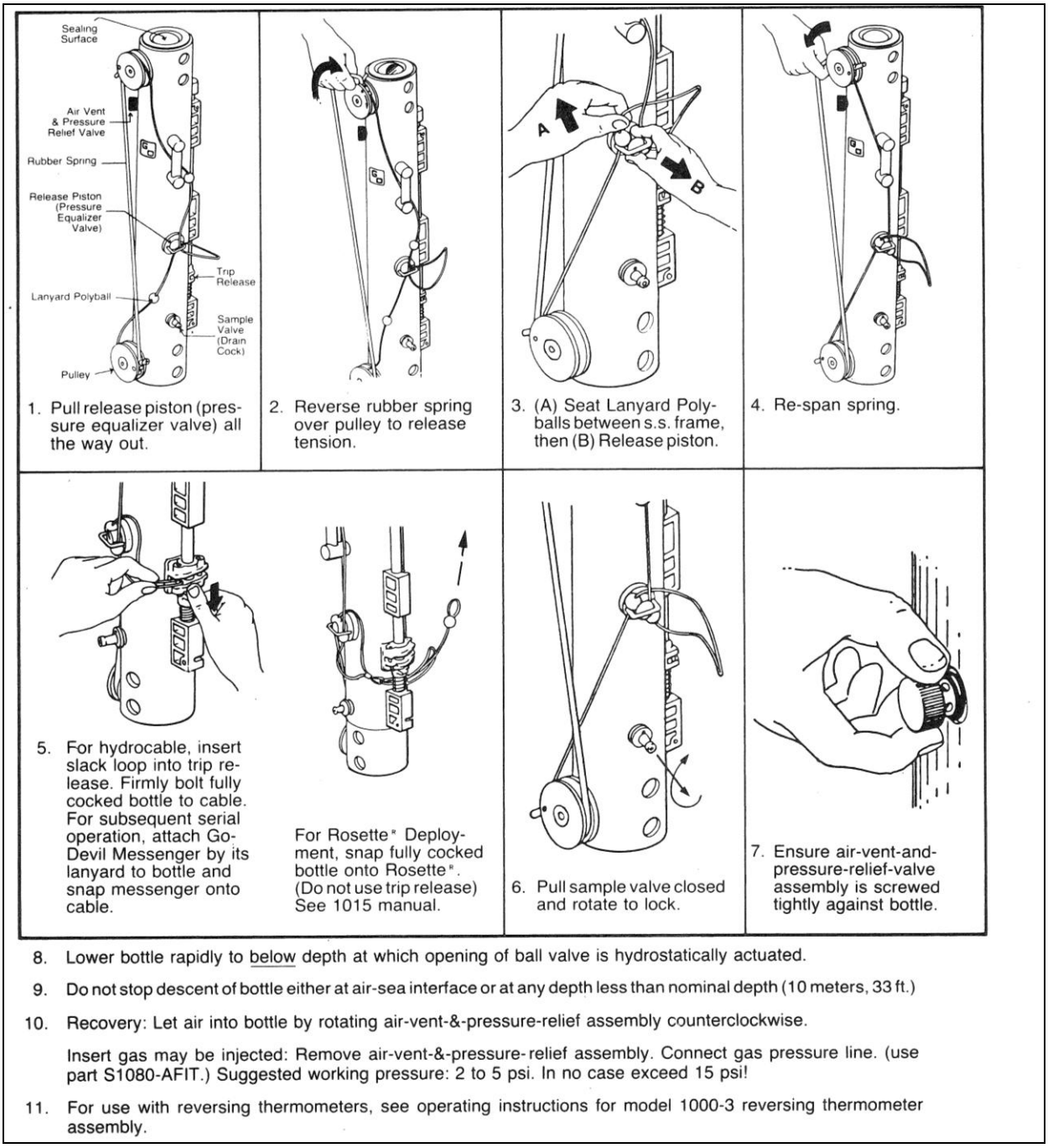


Figure 4-8 GO-FLO assembly for operation

C.4. Maintenance

The following sections detail GO-FLO maintenance procedures.

C.4.a. Silicone Seal Installation

Follow these instructions to install the silicone seal into the water sampler:

1. Insert the white silicone seal into the O-ring groove of the GO-FLO bottle with the ridge down toward the inside of the bottle. Place the O-ring, used to hold the silicone seal, on top.
2. Place the white silicone seal into the O-ring groove so that it fits properly (ridge toward inside of bottle). When in place properly, it can be rotated easily into the groove.

Figure 4-9 Insert white silicone seal

CAUTION: **Do not puncture the silicone seal when installing the O-ring.**

3. Use a blunt wooden dowel sharpened to force the O-rings into the groove over the seal.

NOTE: **The black retaining O-ring will not lay flat when placed into the bottle.**

4. Start at a point on the circle and push the O-ring into the groove. Then rotate the bottle almost 70 degrees and push another section of the O-ring into the groove.

Figure 4-10 Push O-ring section into the groove

5. Continue this procedure until you have the O-ring pushed into the groove at "give locations" around the inside of the bottle. Keep the O-ring evenly spaced while making the installation. Then proceed to push the whole O-ring into the groove as shown.

Figure 4-11 Push whole O-ring into the groove

C.4.b. Disassemble Pressure Relief Valve

Follow these instructions to disassemble the pressure relief valve:

1. Remove end assembly from GO-FLO bottle by pulling out the "spaghetti line" which holds in the rotary ball valves at both ends of the bottle. Work on only the side of the bottle closest to the relief valve. Remove parts of the end ball valve except the rubber diaphragm.
2. The ball (U-bracket) on the pressure valve has been pressed into the cemented-in bushing and needs to be gently pried out, gradually alternating sides. Once it has been removed, you can rotate the central valve core. Looking into the end of the bottle, if the 1/4-inch retaining pin faces another direction, rotate it until it faces in the longitudinal direction.
3. Use the 3/16-inch diameter drift pin, reach through the hold in the rubber diaphragm and drive out the pin. Once the pin is out, the value core can be removed, parts can be cleaned, and the O-ring seal replaced.
4. Reassembly is the reverse of the previous steps. To start the pin into position, if you cannot reach in, the pin can be attached to the drift pin with tape, enough to hold it until it can be reached into position and started.
5. Reassembly of the ball valve end of the bottle is the opposite of the disassembly procedure. Browse to the manufacturer's website cited under "Resources for Further Reading" on the NSF SMART CGPortal website for instructions to disassemble the GO-FLO pressure relief valve.

C.4.c. -Replace Latex Tubing

Follow these instructions to disassemble the GO-FLO latex tubing:

1. Cut off existing latex tubing.
2. Before installing the new latex tubing, wet the end and cut the bias approximately 2 to 3 inches. This allows the latex to slide under the roll pin.
3. Slide cut end under roll pin at upper pulley. Continue to wet the latex tubing when feeding through. Tie end of tubing with overhand knot.
4. Turn bottle upside down and repeat steps 2 and 3.

C.4.d. Replace Pulleys

Follow these instructions to replace the GO-FLO pulleys:

1. Cut off existing latex tubing and the existing Kevlar lanyard.
2. Loosen the screws on both pulleys. Do not lose the white plastic pins.
3. Slide the white plastic pin into the pulley bashing. Install the pulley and tighten both screws.
4. Before installing the latex tubing wet the end and cut off 2 to 3 inches. This allows the latex to slide under the roll pin.
5. Cut the end under the roll pin at the upper pulley and continue to wet the latex when feeding through. Tie end of tubing with an overhand knot.
6. Turn bottle upside down and repeat steps 4 and 5.
7. Contact the manufacturer cited in "Resources for Further Reading" on the NSF SMART CGPortal website for instructions to replace the GO-FLO's Kevlar lanyard.

C.4.e. Equipment Maintenance

Replace the black power cord (spring) when its force drops 25 per cent below initial values of 9 pounds for 1.7 to 2.5-liter bottles, 15 pounds for 5 to 12-liter bottles, and 20 pounds for 20 to 100-liter bottles as indicated in an in-line tensiometer.

Do not grease working parts in high, sediment-laden water (for example, grit trapped in grease sours sealing surfaces). Inspect the O-rings for damage. Wash the bottle with fresh water after use and before storage.

CAUTION: **If solvents other than water are used to clean bottles, test solvents first on small, non-critical area of polyvinyl chloride or Teflon™ coating.**

Store bottles with valves in final closed position. After extended storage, especially before every deployment, ensure all moving parts and seals are free to perform. Remove outer cap rings and valve balls, then slide inner seal ring up and down several times to relieve O-ring from any preset or grease displacement. Samples with screw-type cap require additional torque.

C.5. Data Collection and Field Reporting

Collect water sample data and conduct field reporting per reference (a), Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.

C.6. Packaging and Shipping Procedures

The SSC or a technical specialist within the ICS Environmental Unit instructs and coordinates sample packing and shipping. Keep samples in a cooler on ice if possible.

Procedures for sample collection and analysis will be issued as spill-specific instruction per reference (v), Marine Safety Manual, Volume IX, Marine Environmental Protection, COMDTINST M16000.14 (series).

Adhere to procedures for sampling, handling, packaging, and shipping per reference (w), Oil Sample Handling and Transmittal Guide, United States Coast Guard Marine Safety Laboratory, Eighth Edition, January 2013.

Section D: Self-Locating Datum Marker Buoy

D.1. Equipment Description

A SLDMB is a surface buoy that employs satellite-based technology to determine drift. SLDMBs drift with the water mass and do not require SMART personnel to deploy or relocate after the operation. There are three major system components: the buoys, the satellite system, and the data system.

For more information about SLDMBs, see reference (v), Marine Safety Manual, Volume IX, Marine Environmental Protection, COMDTINST M16000.14 (series).

In addition, download the U.S. Coast Guard Addendum to the United States National Search and Rescue Supplement (NSS) to the International Aeronautical and Maritime Search and Rescue Manual (IMSAR), COMDTINST M16120.2 (series) cited under "Resources for Further Reading" on the NSF SMART CGPortal website.

D.2. Logistics Support Best Practices

USCG operational section chiefs should use USCG aircraft to deploy SLDMBs to provide on-scene measurements of the offshore surface currents. The NSF assisting an incident command in SMART operations can request that an SLDMB be deployed into the oil slick. This action assists the SSCs to model the transport of pollutants.

SMART monitoring teams should work with a sector's command center to arrange for SLDMB deployment. The sector coordinates support through its District command center.

The sector command center can choose to send the SLDMB's drift calculations to the SSC and the SMART Monitoring Team for documentation.

Section E: Photography

E.1. Photography Fundamentals

Review general photography fundamentals and requirements for photography security in Chapter 3, In-situ Burn Operations, Section B: Photography.

E.2. Flight Data Documentation and Reporting

Collect and report flight data per Table 4-2.

Report Type	Source/Report Format Example	Data Format/File Name Convention
Unit Log, Form ICS-214	Source: Unit Log, Form ICS 214-CG. Format: Reference (q), SMART Tier 1 Standard Operating Procedures.	Format: Year/month/day (YYYYMMDD) Save as: SMART Air Team 1 1CS214.doc
Photo Log	Source and format: Reference (q).	Format: YYYYMMDD Save as: "SMART Air Team 1 Photo Log.doc"
Photos	Source: Conventional, digital, or video camera Format: JPEG file.	Save photos as listed when uploaded, thereby ensuring automatic sequential numbering.
Dispersant Application Observation Reporting Form	Source and format: Attachment 7, Dispersant Observation Reporting Form of reference (a), Special Monitoring of Special Monitoring of Applied Response Technologies (SMART) (series), Vol. 8, 2006.	Format: YYYYMMDD Save as: "SMART Air Team 1 Dispersant Application Observation Reporting Form.doc"
NOAA Dispersant Application Observation Reporting Form	Source: Reference (x), Dispersant Application Observer Job Aid, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service. Format: Reference (y), Open Water Oil Identification Job Aid for Aerial Observation, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, NOAA's National Ocean Service, November 2007.	Format: YYYYMMDD Save as: "SMART Air Team 1 1CS214.doc"

Table 4-2 Flight data reporting for dispersant monitoring operations

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Chapter 5: Demobilization

Introduction

This chapter discusses SMART demobilization procedures including decontamination and equipment breakdown, data and sample storage, and equipment stowage and transport. This chapter also provides guidelines for SMART team members to conduct hotwash meetings, compile lessons learned, and implement continuous process improvement for future operations.

In This Chapter

This chapter contains the following sections:

Section A: Decontamination and Equipment Breakdown

A.1. Introduction

Coordinate and conduct decontamination per the incident-specific disposal plan. Vessel decontamination includes:

- Complete hull and deck cleaning.
- Anchor and ground tackle cleaning.
- Cleaning of mooring gear.
- Sea chest cleaning.
- System flushing (as necessary).
- Equipment cleaning (as necessary).

NOTE:

Follow maintenance intervals for decontamination procedures recommended by the equipment manufacturer.

A.2. Decontamination Process and Plan

The Unified Command develops the priorities, processes and policies for the decontamination program per reference (e), Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, DHHS (NIOSH) Publication No. 85-115, October 1985. A decontamination plan shall be developed per reference (z), National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR § 300.

The ICS Vessel Decontamination Branch promulgates a decontamination plan and manages the process for operators to follow. The level of contamination can range from none or very little to considerable.

NOTE:

Only decontaminate once an area is properly secured to ensure protection of the marine habitat.

For more information, see Chapter 2: Planning and Mobilization, Section B.2. Personal Protective Equipment as well as reference (aa) Oil Spill Response Vessel Decontamination Examination Tactics, Techniques, and Procedures (TTP), CGTTP 3-72.1 (series).

A.3. Performance Standards	Establish thresholds of cleanliness per reference (bb), Federal Water Pollution Control Act (Clean Water Act), 33 U.S.C. §1251 et seq. (as amended). This legislation considers a vessel decontaminated if it is free of oil or oil residue that could pose a risk sheening or polluting the environment through the normal course of operations.
A.4. Personnel Certification and Training	The USCG has developed a training and qualification program for decontamination examiners that should be used in the event a vessel decontamination program is established per reference (aa), Oil Spill Response Vessel Decontamination Examination Tactics, Techniques, and Procedures (TTP), CGTTP 3-72.1 (series).

Section B: Data and Sample Storage

B.1. Overview

Coordinate requirements for data and sample storage with the ICS Scientific Support Team. For a broad overview of the monitoring and sampling procedures that can be used for qualitative and quantitative monitoring of oil contamination, download "Sampling and Monitoring of Marine Oil Spills" from "Resources for Further Reading" on the NSF SMART CGPortal website.

Section C: Equipment Stowage and Transport

C.1. Introduction

Following decontamination, pack equipment back in the cases used for deployment. These cases contain foam inserts measured specifically to protect the equipment from damage. SMART equipment, including the DustTrak monitor, C-3 fluorometer, Hydrolab multiprobe, and GoFlo sampler, can be transported via ground or air.

CAUTION:

Ship the DustTrak in its environmental enclosure and separate protective case. See Chapter 4: Dispersant Monitoring Operations, Section A.2. Field Kit Assembly.

C.2. Equipment Chain of Custody

Download and complete a Shipping and Receiving Form (Form DD-1149) during the mobilization process. The NSF SMART CGPortal website provides a hyperlink to this form.

Complete and submit the Shipping and Receiving Form (Form DD-1149) per reference (m), U.S. Coast Guard Personal Property Management Manual, COMDTINST M4500.5 (series). This process is similar to a chain of custody for the piece of equipment when it leaves the unit. The command duty officer verifies the return of equipment from the original Shipping and Receiving Form (Form DD-1149) and the equipment can then be returned to the appropriate shop.

NOTE:

Report all equipment malfunctions to the SMART Group Supervisor and the NSF Response Supervisor.

Section D: Hotwash, Lessons Learned, and Process Improvement

D.1. Hotwash

A hotwash is the immediate after action discussion and evaluation of performance following an exercise, training session, or event. The main purpose of a hotwash session is to identify strengths and weaknesses of the response to a given event. One or more hotwash sessions lead to a subsequent phase known as "lessons learned" which is intended to guide future response to avoid repeating errors.

Conduct hotwash after a mission per reference (cc), Contingency Preparedness Planning Manual, Volume III – Exercises, COMDTINST M3010.13 (series).

D.2. Lessons Learned and Process Improvement

Document lessons learned, best practices, and recommended improvement actions identified during events per reference (dd), Coast Guard After Action Program, COMDINST 3010.19 (series).

Implement a systematic approach to continuous improvement and problem solving per reference (ee), Performance Improvement Guide, U.S. Coast Guard Leadership Development Center, Fifth Edition, 2006. This process implements improvements through five phases (define, measure, analyze, improve, and control) with a focus on meeting requirements, imposing gates at each phase to ensure organizational alignment, and meeting priorities.

Document the results of these processes in the relevant unit case files and the USCG's Marine Information for Safety and Law Enforcement website. The NSF SMART CGPortal website provides a hyperlink to this website.

Appendix A:
Glossary and Acronyms

ADF	Automatic direction finder. A marine or aircraft radio-navigation instrument that automatically and continuously displays the relative bearing from the ship or aircraft to a suitable radio station.
AIS	Automatic Identification System. A shipboard broadcast system that acts like a transponder, operating in the VHF maritime band capable of handling well over 4,500 reports per minute and updates as often as every two seconds.
ALE	Automatic link establishment. The de-facto worldwide standard for initiating and sustaining communications using HF radio
AM	Amplitude modulation.
Best practice	An innovative or modified practice that results in an improved or more effective response and that could merit adoption by other units, platforms, or commands.
BOAT	Boat Operations and Training.
CFR	Code of Federal Regulations.
CGTTP	Coast Guard tactics, techniques, and procedures.
COMMCOM	USCG Communications Command.
Davit	Any of various crane-like devices used on a ship for supporting, raising, and lowering boats, anchors, etc. Davit systems are most often used to lower an emergency lifeboat to the embarkation level to be boarded.
Decontamination	The act of removing hazardous material from the surface of personnel and equipment in such a way as to prevent or minimize the harm that these materials present.
DF	Direction finder.

DHS	Department of Homeland Security.
Dispersant	Chemical compound used after oil spills to break up oil slicks on the water surface and increase the oil's rate of biodegradation.
EO	Electro-optical.
FC-P	FORCECOM TTP Division.
FLIR	Forward-looking infrared radar.
Fluorescence	The emission of light by a substance that has absorbed light or other electromagnetic radiation. It is a form of luminescence. In most cases, the emitted light has a longer wavelength, and therefore lower energy, than the absorbed radiation.
Fluorometer	Device used to measure parameters of fluorescence: its intensity and wavelength distribution of emission spectrum after excitation by a certain spectrum of light.
FM	Frequency modulation.
FORCECOM	Force Readiness Command.
FOSC	Federal On-Scene Coordinator. Federal official designated by either the USCG or Environmental Protection Agency to coordinate response resources.
Geotagging	The process of adding geographical identification metadata to various media
GPS	Global Positioning System. A space-based navigation system that provides location and time information in all weather conditions
HF	High frequency.
Hotwash	The immediate after action discussion and evaluation of performance following an exercise, training session, or event.

ICS	Incident Command System. A standardized approach to the command, control, and coordination of emergency response providing a common hierarchy within which responders from multiple agencies can be effective.
In-situ burn	The process of burning floating oil at sea, at or close to the site of a spill. The oil can be contained by fire-resistant booms at the spill site, then set on fire and burned away.
IR	Infrared.
ISB	In-situ burn. Oil spill response technique that involves the controlled burning of oil that has spilled from a vessel or a facility at the location of the spill.
Jon boat	A flat-bottomed boat constructed of aluminum, fiberglass, or wood with one, two, or three bench seats.
JPEG	Joint Photographic Experts Group, a commonly used method of lossy compression for digital images. The degree of compression can be adjusted, allowing a selectable tradeoff between storage size and image quality.
MILSATCOM	Military satellite communications.
NAVEDTRA	Naval Education and Training Command.
NM	Nautical mile. A unit of distance set by international agreement as being exactly 1,852 meters (about 6,076 feet).
NOAA	National Oceanic and Atmospheric Administration.
NSF	National Strike Force. The NSF provides highly trained, experienced personnel and specialized equipment to USCG and other federal agencies to facilitate preparedness for and response to oil discharges, hazardous materials releases, and weapons of mass destruction incidents.
NSFINST	National Strike Force Instruction.
NVG	Night vision goggles.

O-ring	Also known as a packing or a toric joint, an O-ring is a mechanical gasket in the shape of a torus; it is a loop of elastomer with a round cross-section, designed to be seated in a groove and compressed during assembly between two or more parts, creating a seal at the interface.
Operations Section Chief	A member of the ICS general staff responsible for the management of all operations directly applicable to the primary mission.
pH	A numeric scale used to specify the acidity or basicity of an aqueous solution.
Photometer	An instrument that measures light intensity or optical properties of solutions or surfaces.
PM	Particulate matter. The sum of all solid and liquid particles suspended in air, many of which are hazardous.
POE	Projected Operational Environment.
PPE	Personal protective equipment. Equipment worn to minimize exposure to serious workplace injuries and illnesses that could result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards.
Rescue 21	An advanced maritime computing, command, control, and communications system designed to manage communications for the USCG.
ROC	Required Operational Capabilities.
SLDMB	Self-locating datum marker buoy. A drifting surface buoy that employs satellite-based technology to determine buoy position.
SMART	Special Monitoring of Applied Response Technologies. Monitoring protocol for both in-situ burning and dispersant monitoring operations.
Software-defined radio	A radio communication system where components that have been typically implemented in hardware (e.g., mixers, filters, amplifiers, modulators/demodulators, detectors, etc.) are instead implemented by means of software on a personal computer or embedded system.

SSC	Scientific support coordinator. The SSC is a NOAA scientist who provides the FOSC technical advice with regard to the best course of action during a spill response.
TANB	Trailerable aids to navigation boat.
TTP	Tactics, techniques, and procedures.
UHF	Ultra high frequency.
Unified Command	An authority structure in which the role of incident commander is shared by two or more individuals, each already having authority in a different responding agency.
USCG	United States Coast Guard.
VHF	Very high frequency.
Viton™	A brand of synthetic rubber and fluoropolymer elastomer commonly used in O-rings, chemical-resistant gloves, and other molded or extruded goods.
VOO	Vessel of Opportunity. A vessel engaged in spill response activities and is normally and substantially involved in activities other than spill response; not a vessel carrying oil as a primary cargo.
Water column	A conceptual column of water from the surface of a sea, river or lake to the bottom sediments. Water columns are used chiefly for environmental studies evaluating the stratification or mixing, e.g., by wind-induced currents) of the thermal or chemically stratified layers in a lake, stream or ocean.

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