## 12.0 Oil Spill Coordination/Contingency Planning

The purpose and objective of an oil spill contingency plan is to develop an implementable strategy for a coordinated Federal, state and local response to a discharge or substantial threat of discharge of oil or a release of a hazardous substance from a vessel, offshore facility, or onshore facility operating within the boundaries of a specific port. The adequacy of the existing oil spill contingency plan was assessed for current and projected future vessel movements of crude oil imports through the Delaware River port system. The analysis was done for both the existing channel depth as well as the proposed channel deepening (Greeley-Polhemus Group. 1995).

### 12.1 Existing Plan

The authority to formulate an oil spill contingency plan is specified in Section 4202 of the Oil Pollution Act of 1990 (OPA'90), and amended subsection (j) of Section 311 of the Federal Water Pollution Control Act (FWPCA), which address the development of a National Planning and Response System. As part of this system, Area Committees, comprised of qualified personnel from Federal, State, and local agencies, are established as spill preparedness and planning bodies and are responsible for developing Area Contingency Plans. The nature of such contingency plans is that they are constantly evolving. New data and technology will be verified and incorporated into the plan, to assure and improve the plan's ability to respond to area spill events.

The Philadelphia Area Oil Spill Contingency Plan (June 1994) is currently undergoing a review process. Area contingency plans are reviewed and will be updated yearly until 1997, after which plans will be updated every five years. Information will be checked to be sure it is current, and in particular, areas will be reviewed concerning response equipment information, emergency notification lists, sensitive areas, hazard/risk assessment of the area, response strategies and dispersant approval. To provide preparation and training for actual clean-up operations, exercises and drills are periodically conducted to assess the effectiveness of area contingency plans and relevant tank vessel and facility response plans.

The Philadelphia Area Oil Spill Contingency Plan addresses three scenarios. A response strategy has been prepared for a most probable discharge, a maximum most probable discharge and a worst case discharge including discharges from fire or explosion. Planning for these three types of events covers the expected range of spills likely to occur in this area. Historical spill data are used in planning the most probable and maximum most probable discharge scenarios. Factors such as the size of the largest spill recorded, traffic flow through the area, hazard and risk assessments, seasonal considerations, and spill histories and operating records of vessels and facilities are also taken

into consideration in determining the maximum most probable spill event. The worst case discharge for a vessel is a discharge of its entire cargo in adverse weather conditions.

Prior planning through scenario development is one way to increase effectiveness in response to an oil spill event. Annex I, dated June 1995, deals with scenario development for a range of oil spill events. Three spill scenarios are developed. Each scenario describes in detail an incident, as well as the response to that incident. At present the Area Committee is only required to develop scenarios for oil discharges, but eventually it will address these same three scenarios for hazardous substance releases.

Currently, the three scenarios are described by the Coast Guard as follows:

- Most Probable Discharge: 750 gallons
- Maximum Most Probable Discharge: 483,000 gallons
- Worst Case Discharge: 18.2 million gallons

These amounts are based on historical data (See Table 12-1) and traffic patterns through the area. The worst case scenario involves the loss of an entire ship's cargo, a quantity of 18.2 million gallons. The Coast Guard keeps records on oil spills in the Delaware and has three levels or classifications that can occur. Minor spills involve quantities of oil up to 10,000 gallons. Medium spills range from 10,000 to 100,000 gallons, and a major spill involves over 100,000 gallons of oil released into the river. Historical spill data indicate that from 1986 to 1990, most spills that occurred in the Delaware River were less than 10,000 gallons. Over this same period, over 1,000 minor spills occurred that averaged approximately 150 gallons per spill. Less than 1 percent of all spills in the river are greater than 10,000 gallons. The largest spill occurred in 1986 when the *T/V Grand Eagle* lost 462,000 gallons of crude oil.

Response operations to an oil spill will generally follow a four-phase progression of 1) discovery and notification; 2) preliminary assessment and initiation of action; 3) containment, countermeasures, clean-up and disposal; and 4) documentation and cost recovery. Sections of the Philadelphia Area Oil Spill Contingency Plan address these four areas above, in addition to developing a response strategy for oil, describing actions for removal, waste disposal and remediation, securing operations after an oil spill response, and developing a response strategy for hazardous materials.

The Philadelphia Area Oil Spill Contingency Plan is a voluminous document. The Unified Command System (UCS) is described in detail, as it provides an organization capable of anticipating and responding to pollution response emergencies. The plan is designed to bring together, utilizing an orderly, pre-planned structure, continuous decision-making input from response groups

Table 12-1 - Major Oil Spills in the Delaware River, 1973-1989

| Year | Volume (gallons) | Vessel Source | Location | Accident Type |
|---|---|---|---|---|
| Spills Greater than 100,000 Gallons | | | | |
| 1973 | 126,000 | Tanker | Marcus Hook | Grounding |
| 1974 | 285,000 | Tanker | Philadelphia/Camden | Collision |
| 1975 | 500,000 | Tanker | Marcus Hook | Collision |
| 1976 | 134,000 | Tank Barge | Marcus Hook | Grounding |
| 1978 | 630,000 | Tank Barge | New Castle-Reedy Island | Sinking |
| 1979 | 189,000 | Tank Barge | Marcus Hook | Collision |
| 1985 | 525,000 | Tank Barge | Philadelphia/Camden | Grounding |
| 1989 | 200,000-300,000 | Tanker | Marcus Hook | Grounding |
| Spills Greater than 10,000 Gallons but less than 100,000 | | | | |
| 1973 | 14,720 | Tanker | Ocean Throughway to Delaware Bay | Grounding |
| 1974 | 13,000 | Tanker | Philadelphia/Camden | Fire/Explosion |
| 1975 | 12,000 | Tanker | Marcus Hook | Collision |
| 1975 | 73,000 | Tugboat | Philadelphia/Camden | Capsizing |
| 1976 | 84,000 | Tanker | Philadelphia/Camden | Collision |
| 1979 | 16,800 | Tanker | Philadelphia/Camden | Pipe Rupture |

the city, county, state, Federal and the commercial community level. The organization chart (Figure 12-1) shows the chain of command with the U.S. Coast Guard directing the planning and response processes. A summary of area resources is provided along with logistical details associated with providing personnel, equipment and other resources to support a response effort. The proper use of chemical dispersants to respond to oil spills is addressed. Spill histories of the area are given, including locations in the Port of Philadelphia that have had the most spills, the largest spill on record, the most complex spill, high risk areas for spills, and most realistic and maximum feasible potential spill considerations. Health and site safety concerns, including emergency procedures, general safe work practices, and provisions for adequate and appropriate training when on-site, are also provided.

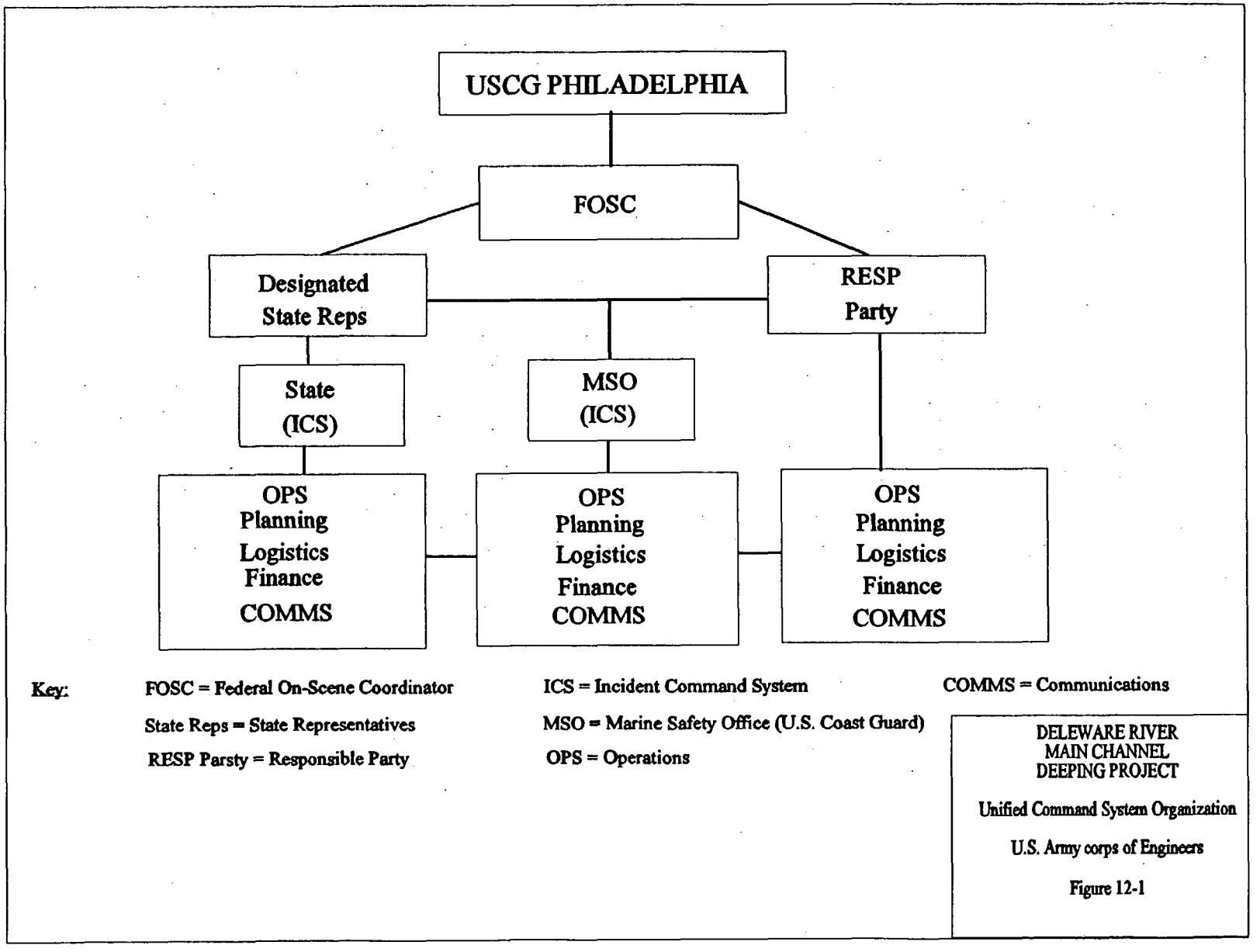
## 12.2 Adequacy of Current Plan

The Contingency Plan is an evolving, dynamic process that integrates a mix of agency and private sector interests with equipment and strategies. The plan is based on national experience and technologies for confinement, clean-up, treatment and communications. The plan, however, is virtually untested.

Before discussing the plan in terms of the proposed deepening and selective bend widening improvements, a recent oil spill incident permits an examination of the effectiveness of the existing plan. As reported in the July 24, 1995 edition of the *Philadelphia Inquirer*, 40,000 gallons of light crude oil spilled into the Delaware River at 5:00 p.m. on Saturday July 22. A strong wind pushed a docked tanker away from its berth as it was transferring approximately 100,000 gallons of crude oil to a refinery located in Gloucester County, New Jersey. This 40,000 gallon spill was the largest since 1989 when 300,000 gallons of heating oil were spilled near Claymont, Delaware when a tanker ran aground.

According to the newspaper, state and Federal officials were notified within 30 minutes of the spill and were mapping out plans to deal with it within an hour. Within 24 hours of the spill, the refinery had contracted with two cleanup organizations and a wildlife rescue agency to deal with any oil-coated wildlife, especially birds. Water intake facilities located along the Delaware River were notified that there may be oil in the water. Environmentally sensitive areas were identified and booms were deployed to keep oil out of these natural resource habitats. A toll free telephone number was made available to the public to answer any questions that they might have as well as to report any oil slicks or oiled wildlife to the proper authorities. Within three days, newspaper reports indicated that about 80 percent of the spilled oil had been mopped up, sponged or vacuumed.

One newspaper article addressed the complaints of local marina owners and operators, as well as several boating enthusiasts,


USCG PHILADELPHIA
FOSC
Designated State Reps
RESP Party
State (ICS)
MSO (ICS)
OPS Planning Logistics Finance COMMS
OPS Planning Logistics Finance COMMS
OPS Planning Logistics Finance COMMS
Key:
FOSC = Federal On-Scene Coordinator
State Reps = State Representatives
RESP Parsty = Responsible Party
ICS = Incident Command System
MSO = Marine Safety Office (U.S. Coast Guard)
OPS = Operations
COMMS = Communications
DELEWARE RIVER
MAIN CHANNEL
DEEPING PROJECT
Unified Command System Organization
U.S. Army corps of Engineers
Figure 12-1

concerning inadequate equipment to handle such a spill. A representative of the Coast Guard (Greeley-Polhemus. 1995) reported that the responsible party (i.e., the refinery) was primarily concerned with containment of the spill and setting-up booms around the ship, and did not adequately take into account other areas along the river as the oil spill spread. The Coast Guard official said that while 40,000 gallons was the initial figure reported, the actual amount spilled into the Delaware River was probably around 80,000 gallons. Nevertheless, during this latest spill event, the Philadelphia area had enough equipment to handle the spill - no outside resources were needed nor called in to assist with clean-up operations. In this official's opinion, the present oil spill contingency plan is adequate.

Interviews with representatives of the Coast Guard, as well as other experts, also provide some idea of the existing plans' ability to deal with spills. Questions on two issues are relevant: 1) what kinds of spills have occurred in the Delaware River/Bay with respect to the planning scenarios? and 2) Is the planning process adequate to respond to the historic experiences in the River and Bay?

The Coast Guard representative who has been stationed at Philadelphia for the last 11 years, could only recall four medium spill events and five major oil spills occurring in the Philadelphia Port area. There were some years when there were no medium or major spills to report in the Delaware River. He also stated that there are approximately 600 spills reported in the Delaware River annually. This number includes spills from lightering operations as well as smaller incidents such as recreational boaters reporting an oil sheen on the river.

Noting that while various aspects can come into play when cleaning up an oil spill, this Coast Guard official felt that at present, the oil spill plan has adequate resources to respond to a 1.5 million to 2.0 million gallon spill. This would include the most probable and maximum most probable spill events. A point was made, however, that there would be both equipment and personnel shortages in responding to a worst case spill of 18.2 million gallons. It was also stated that it would be prohibitively expensive, in his view, to maintain such levels of readily available materials for such a rare event.

In general, the Delaware Main Shipping Channel is safe. Despite its length, the volume of traffic and the number of turns required, there are few casualties and few oil spills occurring in the waterway. The high degree of skill and training by pilots, navigation aids built and maintained by the U.S. Coast Guard, and an overall sense of cooperation among various waterway interests contribute to the navigation safety of the Delaware River. The channel deepening is expected to reduce lightering operations at the Big Stone Beach Anchorage by 40%. This is expected to reduce barge traffic servicing the benefiting oil

refineries located in the Philadelphia/Camden area and therefore the likelihood of oil spills. Based on historical spill data, the existing oil spill contingency plan for the Philadelphia port appears adequate to handle the vast majority (over 99 percent) of oil spills that may occur in the area. An expert panel was assembled to evaluate navigation safety of the Delaware River/Bay. The panel was comprised of seven members of the Delaware River and Bay marine industry including pilots, tug operators, oil interests, and barge companies. Individual interviews were first conducted with each panel member, followed by a plenary session with the set of experts in attendance. From interviews with these experts knowledgeable about the Delaware shipping channel, the channel deepening project, with its selective bend easings, is expected to continue the record of safety in the Delaware River/Bay that has been achieved by the local waterway users, and the present oil spill plan appears to be able to meet the vast majority (over 99 percent) of anticipated future oil spill response needs of the port community. According to the Environmental Protection Agency, the oil spill response network established by the U.S. Coast Guard, Marine Safety Office, Philadelphia is long established and is considered to be as adequately prepared for oil spill response as any in the Nation (Marie Jenet, Personal Communication, U.S. Environmental Protection Agency, Region 2, April 29, 1996).

## 12.3 The Marine Spill Analysis System (MSAS)

To assist the numerous agencies responsible for the Philadelphia Area Oil Spill Contingency Plan, the Corps of Engineers, Philadelphia District, has looked at various ways of modeling the Delaware Bay in the event of a spill. Although there are several existing models already available, few have a strong focus on environmental resources at risk. Most of these models focus on the trajectory of a spill event, which fundamentally means trying to "forecast" the path based on the initial or present location of the spill. Trajectory modeling is usually the first request of response teams and has proven to be essential throughout a spill event, however may be limited by the availability of "real-time" local weather forecasts. An alternative to trajectory modeling is "resource at risk" analysis which allows a responder to focus on locations in the Delaware River and Bay having high environmental significance and target those areas for protection.

The Florida Marine Research Institute (FMRI) has been working with Environmental Systems Research Institute Inc. (ESRI) to develop a decision support system focusing on natural resource protection. Due to funding limitations, FMRI was not able to fully develop the system. A combined effort between the Corps of Engineers, New Jersey DEP and the US Fish and Wildlife Service, was established to jointly fund additional work efforts by ESRI, resulting in the Marine Spill Analysis System (MSAS) for ArcView2. The MSAS was completed in April 1996 and was designed specifically for the Delaware River and Bay Area. The MSAS is a personal computer based analysis tool that utilizes Geographic

Information Systems (GIS) technologies to support the life cycle of oil spill management; planning, response and damage assessment, to ultimately minimize environmental impacts within the river and bay areas. The MSAS will integrate living resource data with spill information and emergency facility locations, allowing managers to: 1) effectively carry out emergency response operations; 2) prioritize response areas and actions; 3) help produce timely damage assessments.

The MSAS has the capability to import spill trajectory boundaries produced by other spill models allowing for a quick calculation of quantities for those areas in danger, thus providing timely information to help protect natural resources at risk. An Emergency Facilities database is linked to the system helping the user in deciding which Emergency Personnel to contact during a spill event. In addition, a comprehensive database consisting of numerous environmental resource datasets for the river and bay area are available to the user for impact analysis. All output from the system can be used by the Philadelphia Area Committee for practice spill drills and to help emulate various levels of spill scenarios.