

Saudi Aramco
Oil Spill Contingency Plan

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Overview

The importance of the Arabian Gulf to the economy of the region and of the world cannot be overstated. More than a quarter of the world's crude oil is produced by the Gulf States in the region and there is also significant offshore gas and NGL production. Billions of barrels of crude oil are loaded through terminals on the Gulf and transported by thousands of tankers to most parts of the world, every year. Inherent in this activity, however, is a considerable environmental risk.

Recognizing the importance of the Arabian Gulf as a source of food and water supply, as well as providing work and living for many of its coastal residents, the national agencies and the oil industry go to great lengths to ensure the safety of operations and to protect the marine environments. The emphasis is always on preventing the escape or accidental spillage of oil but when spills occur, governments and industry have in place oil spill contingency plans supported by equipment, to provide a suitable response.

Saudi Aramco Oil Spill Contingency Plan

Saudi Aramco's earliest efforts were focused on self-sufficiency in handling spills, and the company built specialized oil spill recovery and containment vessels, and purchased equipment and materials to combat spills. In 1989 Saudi Aramco designated a task force and a high level review committee to assess our capability worldwide and make recommendations where needed.

As a result of the review task force recommendations, we have developed the Global Oil Spill Contingency Plan.

- The plan establishes an oil spill policy for Saudi Aramco's worldwide operations.
- It directs Saudi Aramco and its affiliates to join major cooperatives.
- It assigns regional responsibility for oil spills and requires the development, implementation, and maintenance of regional and owned tanker oil spill response plans. The regional plans outline formal notification procedures for involved countries, and Saudi Aramco. Regional plans include local legislative requirements, define response options, and identify available resources for combating oil spills.

Recognizing the potential impact of oil spills, a management-level Oil Spill Committee was established in 1990. It sets overall policy regarding the prevention and cleanup of oil spills resulting from Saudi Aramco operations. A permanent organization, the Global Oil Spill Coordination Group, was established reporting to the Vice President of Supply and Transportation. The group executes and coordinates all activities of the company relating to prevention and control of marine oil spills. A Regional Oil Spill Coordinator (ROSC) is assigned to each region and in the event of an oil spill, he directs an Oil Spill Response

Team (OSRT) to combat the spill. He has responsibility for all activities related to activating the response team including : safe & efficient control, cleanup operations, disposal, restoration, and documentation of oil spills. A contingency plan has been formalized and developed for each region.

Oil pollution control equipment is staged at both the Arabian Gulf and at the Red Sea. At the Arabian Gulf, equipment is located at Tanajib up north and at Ras tanura down south. Equipment includes recovery vessels, booms, skimmers, storage barges, air and sea born dispersant systems, etc.

At the Red Sea region we staged equipment at each facilities. Equipment at each location was designed as a tier 1 to handle small to medium size spills in the vicinity of each facility. In the event of a major oil spill which is believed to be beyond local response capability, extra resources will be brought in from Ras Tanura and from other sources as deemed necessary.

In order to strengthen Saudi Aramco's oil spill combatting capabilities, the company has acquired membership and participation on an international scale, in organizations that provide cooperative assistance in the event of an oil spill and sharing of oil spill technology. These organizations are: Oil Spill Response (OSR) Ltd.. at England which currently provides a worldwide spill response capability; Clean Caribbean Cooperative (CCC) for the Caribbean Sea area; the Marine Preservation Association (MPA) in the united states; Marine Industry Response Group (MIRG) in the Gulf of Mexico, and Gulf Area Oil Companies Mutual Aid Organization (GAOCMAO) in the Arabian Gulf

Saudi Aramco Response to the 1991 Gulf Oil Spill

Background

On January 25, 1991, Saudi Aramco activated its Oil Spill Contingency Plan. This was in response to information received from the Saudi Arab Government indicating that a massive oil spill was flooding the Gulf as a result of the Gulf War. The initial release of oil was estimated to have occurred on approximately January 20, 1991.

Saudi Aramco's Oil Spill Response Team (OSRT) was immediately called into action to design and implement measures to protect the Kingdom's Gulf coastal oil production and industrial facilities from the effects of the spill.

By January 26, 1991, field teams had been dispatched to the areas near Safaniya and Tanajib in northern Saudi Arabia, where major oil production and desalination plants are located. Coordination with the Kingdom's Meteorology and Environmental Protection Administration (MEPA) also was established.

The company marshalled its resources and requested support from a variety of oil spill

cooperatives to which it belongs. This included Oil Spill Response (OSR) Ltd. in the United Kingdom and the Gulf Area Oil Companies Mutual Aid Organization (GAOCMAO) headquartered in Bahrain.

Emergency procedures were activated by the company to facilitate the procurement of materials and services worldwide.

The Research Institute of King Fahd University of Petroleum and Minerals (KFUPM/RI) was requested to run a computer model of the spill and predict its behavior. Consultants and specialized equipment operators from the United States and Europe also were mobilized to combat the spill.

The volume of oil released into the Gulf has been the subject of much debate and wide speculation. Because the 1991 Gulf Oil Spill occurred in a war zone, and because the release points of the oil were inaccessible to international oil spill response experts and marine scientists until the war's conclusion, it may never be known exactly how much oil was spilled. Estimates have ranged widely.

Sources such as MEPA, Saudi Aramco, the United Nations Educational, Scientific and Cultural Organization's Intergovernmental Oceanographic Commission (UNESCO's IOC), the U.S. National Oceanic and Atmospheric Administration (NOAA) and the U.S. Coast Guard have made final estimates of the spill's size in amounts ranging from about 6 million to 8 million barrels of oil. It is impossible to be more precise.

We do know that vast quantities of oil were released into the Gulf. And, while the debate about the spill's actual size continues, most experts agree that the 1991 Gulf Oil Spill was the largest in history.

Strategies

An oil spill of this magnitude, occurring in the midst of war, had never been envisioned by the company when it created its corporate oil spill contingency plans. Nor had an occurrence of this type or magnitude been anticipated by any other oil company or government around the world. Saudi Aramco's oil spill response strategies were designed to deal with spills resulting from industrial accidents, or the accidental grounding or collision of oil tankers at sea. Because of the nature and magnitude of this spill, many rapid adjustments to the company's oil spill policies and procedures were necessary.

Once activated, the OSRT pursued three main objectives:

- To protect critical oil production and industrial facilities located along the Kingdom's Gulf coast;
- To recover spilled oil;
- To minimize the impact to the environment.

The widespread extent of the spills and their initial inaccessibility made early efforts to protect the environment and wildlife extremely difficult. MEPA and the National Commission for Wildlife Conservation and Development (NCWCD) were charged with the overall efforts to protect environmentally sensitive areas and wildlife, where possible. Saudi Aramco assisted these two organizations in their mission by providing needed resources.

Saudi Aramco's primary responsibilities, as designated by the Saudi Arab Government, focussed on the protection of critical oil production and industrial facilities located along the coast, containment of the spill and recovery of floating oil to keep it from endangering even larger areas of the Gulf.

Methodology

Oil spill response activities are always best carried out promptly at the source of a spill, before weathering has thickened the oil. Hostilities in the northern Gulf and the sheer magnitude and inaccessibility of the spill early on prevented such timely action.

During the first weeks of Saudi Aramco's Gulf Oil Spill response activities, several attempts were made to spray chemical dispersants on sections of the spill which had drifted south of the combat zone into areas accessible at times to civilian helicopters and fixed-wing aircraft. However, these efforts to disperse the spill proved largely ineffective because the oil had become extremely weathered and hardened in the time it took to move south of the war zone. The use of chemical dispersants was discontinued once the initial applications proved ineffective.

Despite the failure of chemical dispersants in this instance, physical barriers of various configurations proved highly successful in protecting critical coastal facilities from the effects of the spill.

Booms were used to divert floating oil away from seawater intakes at the threatened plants. They also were used to direct the oil towards specific collection points along the shore, where sumps were set up help recover it.

Sand barriers also were constructed near the seawater intakes of the facilities and in back bay areas to help protect them. Heavy plastic sheeting was installed near some of the porous rock jetties surrounding seawater intake channels. This was done in an effort to prevent large amounts of oil from seeping into the channels where it could directly threaten the plant's operations.

Through the efforts and dedication of its entire work force and the SORT, Saudi Aramco was able to keep all of its coastal facilities operating without interruption throughout the crisis.

The company designed or installed protection schemes for a number of environmentally sensitive areas and facilities located along the Gulf coast.

The company directed all of its available manpower and equipment to oil spill recovery efforts for the duration of the crisis. Saudi Aramco's resources were supplemented with additional equipment and vessels purchased or chartered on an emergency basis, and with equipment and materials obtained through commercial suppliers and the international oil spill cooperatives to which the company belongs. Saudi Aramco also made extensive use of contract labor crews and oil spill response consultants during the emergency.

At the conclusion of its oil spill response operations, Saudi Aramco had recovered over 1 million barrels of oil from the sea and near-shore areas in the Gulf- a world record oil spill recovery volume. More than 35 sites had been established to recover oil at Tanajib, Safaniya, Manifa, Abu 'Ali and Jubail. Over 120 kilometers of access roads had been constructed to reach many of these remote locations.

It is also important to note that the company achieved this recovery at the same time it was increasing its oil production by over 3 million barrels a day. These increases were undertaken at the direction of the Saudi Arab Government to help stabilize world oil supplies and economies threatened by the shortfalls resulting from lost production in Iraq and Kuwait.

The full extent of the environmental damages brought on by this massive spill will probably never be fully understood. However, the scope of the Kingdom's oil spill recovery operations, along with the strategic placement of protective booms and sand berms at specific northern sites, provided a significant measure of protection for many additional coastal, sea and shore environments south of Abu 'Ali Island which otherwise would have been devastated.

Resources

During its oil spill response operations, Saudi Aramco mobilized over 80,000 cubic meters of protective equipment and spill response materials through air-expedite orders. Together, these materials filled more than 30 dedicated cargo planes, which had the added complications of entering and exiting a war zone.

The company's oil spill response team was comprised of approximately 150 company employees and 350 contractor personnel. To combat the spill, they utilized over 40 pieces of heavy construction equipment, 35 vacuum tanker trucks, 57 skimmers of varying designs and nearly 80 kilometers of protective booms, along with 32 seagoing recovery and marine support and storage vessels.

Company helicopters and fixed-wing aircraft logged over 500 hours of surveillance flight time to chart the movement and condition of the spilled oil. Additional oil spill surveillance flights were provided, when possible, by the military and other Saudi Arab Government agencies, who shared their combined data with both MEPA and Saudi Aramco.

More than 90 short and long form contracts were initiated by the company to secure contractor services required to combat the spill. And over 400 proposals outlining new technologies and offers for assistance were received and evaluated.

Thirty-six Saudi Aramco departments contributed directly to the company's 1991 Gulf Oil Spill response efforts by providing personnel, equipment, materials or support services.

Dozens of other company departments offered additional indirect support.

Constraints

Dealing with any emergency at sea is difficult even under the best of conditions. But this spill's proximity to the war zone created even larger handicaps for the company in its oil spill response operations. Because of the war a variety of routine procedures, such as the spraying of chemical dispersants, could not be carried out early enough to be effective.

Generally speaking, oil spill response teams rely heavily on daily aerial and marine surveillance to determine the size of a spill and track its path of migration. On many days, oil spill surveillance in the Gulf was not possible due to the war and its aftermath. Smoke from the oil field fires in Kuwait further complicated spill surveillance efforts.

Lack of commercial flights into the region made the delivery of badly needed materials both slow and costly.

Furthermore, the spill's proximity to the Kuwaiti border and hostile forces made it especially difficult for the company to recruit additional contract labor crews to assist in the spill response efforts at Safaniya and Tanajib.

Conclusion

Despite the obstacle it encountered, Saudi Aramco was highly successful in its role in combating the 1991 Gulf Oil Spill. The cooperation and response of all parties associated with this effort was commendable. The company's existing oil spill contingency plans proved effective, but modifications and improvements to the plans were found necessary.

Traditional and non-traditional approaches were employed to protect facilities, contain the spill and recover significant amounts of oil. By meeting the challenges of this spill, Saudi Aramco has become better prepared to deal with possible future emergencies and disasters which we hope will never occur.