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# DISPERSANT USE & REGULATION TIMELINE

## Things You Should Know

Scientists have been studying the effects of dispersants and dispersed oil on the marine environment for over 30 years so much is already known and research is still ongoing.

In addition to laboratory studies, real world spills have provided responders with lessons about how to use these products more efficiently and with the fewest impacts to the ecosystem.

The lessons have resulted in modern commercial dispersants that are more effective and safer to use in the environment than materials used in early response efforts.

## Overview

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

Dispersants can be used under a wide variety of conditions since they are generally not subject to the same operational and sea state limitations as the other two main response tools — mechanical recovery and burning in place (also known as in-situ burning). While mechanical recovery may be the best option for small, near-shore spills, which are by far the majority, it has only recovered a small fraction of large offshore spills in the past and requires calm sea state conditions that are not needed for dispersant application. When used appropriately, dispersants have low environmental and human health risk and contain ingredients that are used safely in a variety of consumer products, such as skin creams, cosmetics, and mouthwash (Fingas, et al., 2001; 2005)

This fact sheet summarizes significant spill events and subsequent regulatory changes that have advanced spill response and the use of dispersants as an operational response tool.

## Fact Sheet Series

- Introduction to Dispersants
- Dispersants — Human Health and Safety
- Fate of Oil and Weathering
- Toxicity and Dispersants
- Dispersant Use Approvals in the United States
- Assessing Dispersant Use Trade-offs
- Aerial and Vessel Dispersant Operations
- Subsea and Point Source Dispersant Operations
- **Dispersants Use and Regulation Timeline**
- Dispersant Use in the Arctic Environment

# Introduction

On 18 March 1967, the tanker vessel (T/V) *Torrey Canyon* ran aground on Pollard's Rock near Cornwall, England carrying nearly 860,000 barrels (36,120,000 gallons; 137,000 m$^3$) of crude oil. Much of the oil was consumed in a fire or lost into the Atlantic Ocean. The spill response in 1967 was the first time responders realized that mechanical recovery methods were not going to be effective for the incident because of the weather and wave conditions in the spill area. As a result, they attempted to chemically remove the oil from the water surface and shoreline and mix the oil into the water column using chemical degreasers that were not designed for oil spill response to "disperse" the oil. This was an unfortunate initial attempt to "disperse" oil as these degreasers are generally cited as doing more harm than good.

From these beginnings, the world response community has learned many lessons and now utilizes very different low toxicity dispersant formulations. Dispersants are a key component of the spill response tool kit, and in many cases and countries they represent a primary or secondary response option. In all cases, dispersant products and their use are regulated by government agencies to ensure that they are used appropriately and effectively.

**Figure 1(a-e)** displays a timeline from 1967 to 2010 that summarizes the history of significant spill response events with dispersant use and the subsequent regulatory actions. It should be noted that the list is a sampling of events and does not include the evaluation of dispersant performance during numerous large scale test tank and field trial evaluations. As lessons have been learned and regulatory requirements have been developed, modern dispersants have been prepared that are effective under a range of conditions and when used appropriately, have low environmental and human health risk. The decision to use or not use dispersants in response to a spill should be based on a well informed Net Envrionmental Benefit Analysis (NEBA) (see **Fact Sheet 6: Assessing Dispersant Use Trade-offs**).

### 1967 — *T/V Torrey Canyon*, Cornwall, England, UK

At the time, the *T/V Torrey Canyon* was the biggest on-water oil spill in world history — losing nearly 470,000 barrels (19.7 million gallons; 75,000 m$^3$) of crude oil over a 12 day period. Little was known about how to deal with a spill of this size. Ultimately, more than 120 miles (190 km) of coastline were affected by the oil with extensive damage to marine and intertidal communities. The spill created an oil slick measuring 270 square miles (700 km$^2$), and oiled 180 miles (300 km) of coastland. More than 15,000 sea birds and large numbers of aquatic animals were estimated to be killed before the spill was brought under control. Unfortunately, efforts to clean up the oil only compounded the situation when the Royal Navy attempted to disperse it using industrial degreasers.

These products were toxic, resulting in a great deal of damage to the marine environment, birds, sea lions, and other marine life. The use of these degreasers is generally considered to have been a great mistake.

### 1968 — Initial US National Contingency Plan

The US responded to the *Torrey Canyon* spill by developing its first National Contingency Plan (NCP). It was the nation's initial attempt to develop a coordinated approach to cope with potential spills in U.S. waters and provided the first comprehensive system of accident reporting, spill containment, and cleanup.

### 1969 — Well A-21 Blowout — Santa Barbara, CA, USA

On 28 January 1969 the Santa Barbara, CA well (A-21), located six miles off the coast, experienced a blowout and oil began to leak. Several unsuccessful attempts were made to cap the leak. An estimated 77,000 barrels (3.2 million gallons; 12, 000 m$^3$) of oil were released, causing significant damage to shorelines and injuring thousands of birds and marine mammals. As part of the response, 900 barrels (37,500 gallons; 143 m$^3$) of the product, ARA Gold Crew Bilge Cleaner, were applied to the slick in an attempt to mix the oil into the water column to prevent shoreline impacts. As with the *Torrey Canyon* response, this product was not created for dispersing oil. No official estimates of effectiveness or toxicity were made for the cleaning product (Fingas 2011; NOAA, 1992).

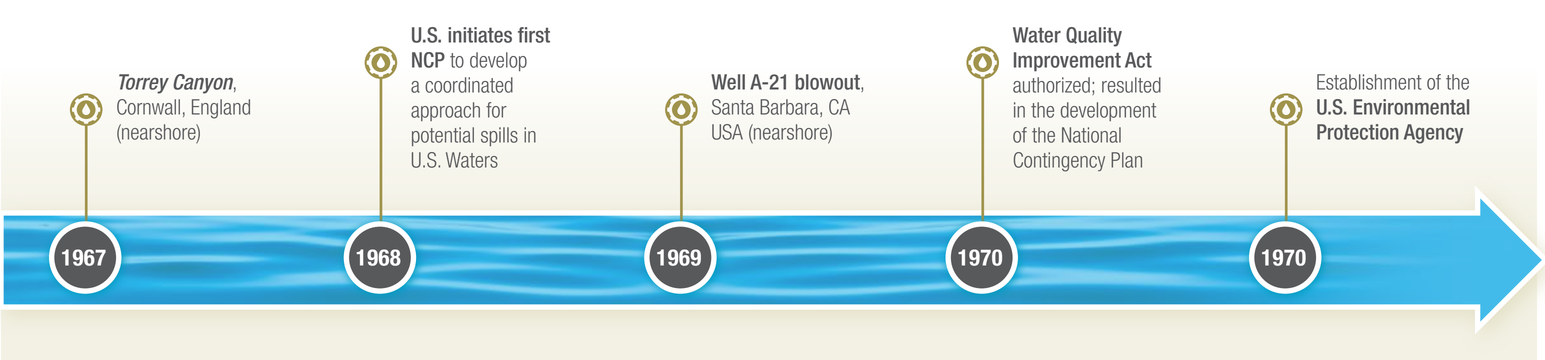
1969 Santa Barbara well blowout. Photo: from the LA Times *online*

The 1969 Santa Barbara Well A-21 response was the first use of dispersants during an ocean blowout.

### 1970 — Water Quality Improvement Act and NCP Authorized

Recognizing the importance of clean water to the public health and welfare, the US Congress legislated the basic legal authority for federal regulation to improve the quality

**FIGURE 1(A).** Timeline of dispersant use and subsequent regulatory changes: **1967 – 1970**




of water resources and to establish a national policy for the prevention, control, and abatement of water pollution. Additional legislation was passed that expanded its authority over water quality standards and water polluters through the Water Quality Improvement Act of 1970. This Act placed additional limits on the discharge of oil into water where it could damage human health, marine life, wildlife, or property. The act also included a number of other provisions intended to reduce water pollution.

Congress also broadened the scope of the NCP to include a framework for responding to hazardous substance spills as well as oil discharges. Over the years, additional revisions have been made to the NCP to address further legislation related to oil spills.

### 1970 — US Environmental Protection Agency Established

On 2 December 1970, President Nixon established the US Environmental Protection Agency (EPA) to consolidate federal research, monitoring, standard-setting, and enforcement activities into one agency to ensure environmental protection of US waters.

Due to the haphazard nature of water quality regulation, Congress restructured the authority for water pollution control and consolidated authority in the EPA Administrator.

### 1970 — Chevron Main Pass Block 41, Platform C, Gulf of Mexico (GOM), USA

On 10 February — 10 March 1970, the Chevron Main Pass Block 41C platform burned as oil and gas were lost from the wellhead. An estimated 65,000 bbls (2.7 million gallons; 10,300 $m^3$) of crude oil were released into the environment. Once the fire was out, approximately 2,000 bbls (84,000 gallons; 320 $m^3$) of dispersants were applied to the platform to prevent the rig from re-igniting; no attempt was made to treat the entire slick with dispersants. Little damage was recorded for beaches, wildlife, or marine life from the spill and dispersed oil. The application of dispersants in this manner was from a health and safety standpoint, rather than as an operational response tool (NOAA, 1992).

### 1972 — US Clean Water Act Authorization

The Federal Water Pollution Control Act of 1948 was the first major US law to address water pollution. As amended in 1972, the law became commonly known as the Clean Water Act (CWA). The amendment (*from EPA online*, 2012):

- "Established the basic structure for regulating pollutants discharges into the waters of the US.
- Gave EPA the authority to implement pollution control programs such as setting wastewater standards for industry.
- Maintained existing requirements to set water quality standards for all contaminants in surface waters.
- Made it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit was obtained under its provisions.
- Funded the construction of sewage treatment plants under the construction grants program.
- Recognized the need for planning to address the critical problems posed by nonpoint source pollution."

**FIGURE 1(B).** Timeline of dispersant use and subsequent regulatory changes: **1970 – 1979**

**1970** — **Chevron Main Pass Block 41, Platform C** (offshore); 2,000 bbls of dispersant applied — considered effective

**1972** — Establishment of the **Clean Water Act of 1972**. Extensive legislation in U.S.; made provisions for post spill reporting, response, & liability by responsible party

**1973** — International Maritime Organization (IMO) adopted the **MARPOL**

**1978** — ***Eleni V***, collision off SE Coast of England (offshore); 6,800 bbls dispersant applied; Considered ineffective due to high viscosity oil

**1979** — **Ixtoc I** well blowout, Bay of Campeche, Mexico (offshore)

## 1973 — International Maritime Organization Adopts International Convention for the Prevention of Pollution from Ships (MARPOL)

The IMO adopted the International Convention for the Prevention of Pollution from Ships (MARPOL) on 2 November 1973, which covered pollution by ships from operational or accidental causes. This included pollution from oil, chemicals, harmful substances in packaged form, sewage, and garbage. Subsequent modification of the 1973 Convention has incorporated tanker design and operations into the Protocol (IMO online, 2013).

## 1978 — *T/V Eleni V*, Southeast coast of Norfolk, England, UK

On 6 May 1978, the *T/V Eleni V* collided with another vessel and was broken in two off the southeast coast of England. Approximately 52,500 bbls (2.2 million gallons; 8,400 $m^3$) of heavy fuel oil was released. The oil was very thick and produced a large "viscous slick that was brown to black in color" (NOAA, 1992) and impacted both the UK and Dutch coastlines with thick emulsions washing ashore. Responders applied some 6,800 bbls (285,000 gallons; 1,100 $m^3$) of dispersants over a three week period to the spreading slicks. However, due to the oil type, weathering, and emulsification, the products available at the time were not effective and did little to prevent shoreline oiling. This response confirmed that the dispersant formulations that existed at the time were not effective on heavy viscous oils (NRC, 1989).

## 1979 — Ixtoc-1 Well Blowout, GOM, Mexico

On 3 June 1979 the Ixtoc I platform, located in Mexico's Bay of Campeche located in the southern Gulf of Mexico, experienced a blowout due to a loss of drilling mud circulation. The oil and gas being released at the surface caught fire and the platform collapsed into the wellhead area, preventing initial attempts to control the release.

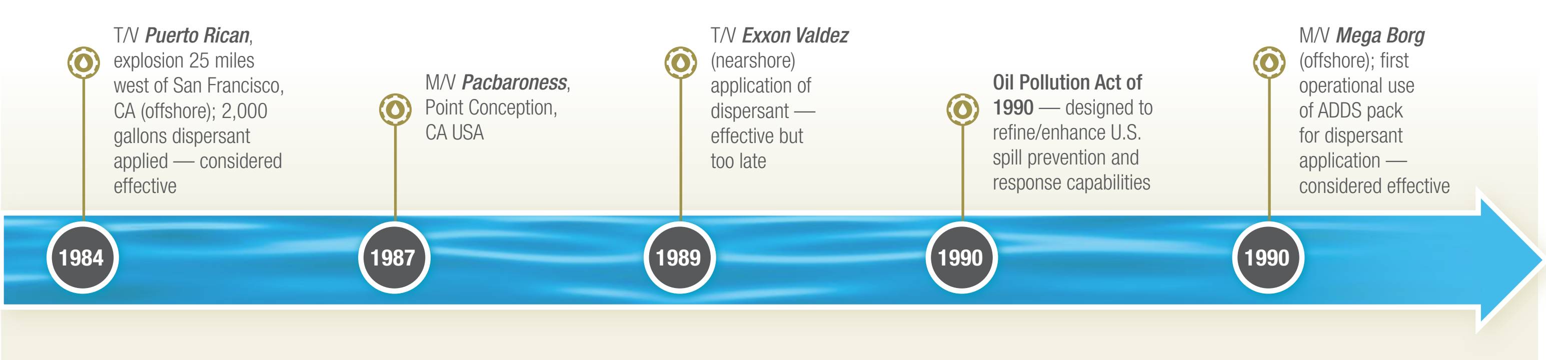
IXTOC-1 well blowout. Photo: NOAA.

The well was estimated to produce 20,000 barrels per day [bpd] (840,000 gallons per day; 3,200 $m^3$ per day). When it was capped on 23 March 1980, the total discharge was estimated to be 3,520,000 bbls (148 million gallons; 562,000 $m^3$) (Fingas, 2011; NOAA, 1992). As part of the response, approximately 1,100 square miles (2900 $km^2$) of surface slicks in Mexico's waters were treated with the dispersant Corexit© 9527 which was designed specifically for use with on-water oil spills. While quantitative measurements of dispersant effectiveness do not exist for the multiple applications to a range of different slicks, there were indications that the use of dispersants did reduce the amount of surface oil (Fingas, 2011; NOAA, 1992; NRC, 1989).

## 1984 — *T/V The Puerto Rican*, San Francisco, CA, USA

The *T/V Puerto Rican* response was the first time that dispersants were authorized on a major oil spill in the US. The ship broke into two parts following explosions and fires approximately 32 miles (51 km) offshore from the Golden Gate Bridge, San Francisco, CA. Approximately 100,000 barrels (4,200,000 gallons; 16,000 $m^3$) of lube oil, bunker fuel, and additives were discharged into the Pacific Ocean. The spill was treated with 50 barrels (2,000 gallons; 7.6 $m^3$) of Corexit 9527 and was considered initially effective (NOAA, 1992; NRC, 1989).

**FIGURE 1(C).** Timeline of dispersant use and subsequent regulatory changes: **1984 – 1990**




### 1987 — *M/V Pacbaroness*, Point Conception, CA, USA

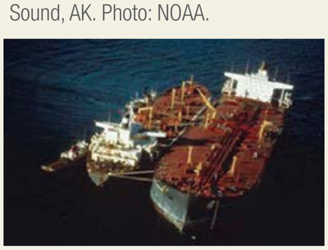
*Pacbaroness*. Photo: NOAA.

After a collision with another vessel, the bulk carrier *Pacbaroness* sank in almost 1,400 feet (425 m) of water almost twelve miles (19 km) off the coast of Point Conception, CA, discharging over 30 bpd (1,200 gallons per day; 4.6 $m^3$ per day) of fuel oil. It is thought that up to 475 bbl (20,000 gallons; 760 $m^3$) of fuel oil may have been released from the wreckage.

This spill provided an opportunity to study the effectiveness of oil dispersants. Three separate dispersant trials were conducted by applying more than 8 barrels (350 gallons; 1.3 $m^3$) of Corexit 9527 using fixed wing aircraft and helicopter applications. Even with careful measurements, the results of the study were somewhat inconclusive because of complicating factors, such as slick breakup due to heavy winds, the thin nature of the slick and the limited area of treatment (NOAA, 1992).

### 1989 — *T/V Exxon Valdez*, Prince William Sound, AK, USA

*Exxon Valdez* incident in Prince William Sound, AK. Photo: NOAA.



The 24 March 1989 grounding of the tanker *Exxon Valdez* on Bligh reef created the US's second largest on water spill response, with more than 262,000 bbls (10,900,000 gallons; 41,000 $m^3$) of crude oil released into a remote, scenic, and biologically productive body of water. The type of oil that was released, Alaska North Slope or ANS, has been studied on numerous occasions since and has been found to be amenable to dispersion. An initial aerial dispersant application trial was thought to be successful, but severe weather during the early stages of the spill response halted any further dispersant applications and dispersants were not a tool that was used during the response (Wiens, 2013)

This incident prompted the US to revise its oil spill prevention, response, and cleanup preparedness regulations.

### 1990 — The Oil Pollution Act of 1990

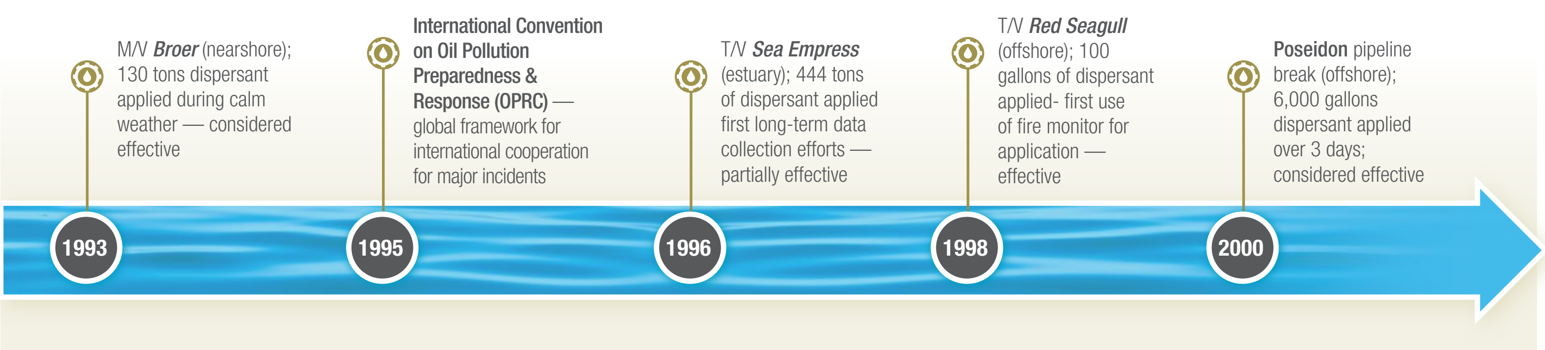
The US Congress passed the Oil Pollution Act (OPA) in August 1990, following the Exxon Valdez incident.

"The OPA improved the nation's ability to prevent and respond to oil spills by establishing provisions that expand the federal government's ability, and provide the money and resources necessary, to respond to oil spills. The OPA also created the national Oil Spill Liability Trust Fund, which is available to provide up to one billion dollars per spill incident.

In addition, the OPA provided new requirements for contingency planning both by government and industry. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) has been expanded in a three-tiered approach: the Federal government is required to direct all public and private response efforts for certain types of spill events; Area Committees — composed of federal, state, and local government officials — must develop detailed, location-specific Area Contingency Plans; and owners or operators of vessels and certain facilities that pose a serious threat to the environment must prepare their own Facility Response Plans.

Finally, the OPA increased penalties for regulatory noncompliance, broadened the response and enforcement

**FIGURE 1(D).** Timeline of dispersant use and subsequent regulatory changes: **1993 – 2000**




authorities of the Federal government, and preserved State authority to establish law governing oil spill prevention and response." (excerpted from USEPA online, 2011)

### 1990 — *T/V Mega Borg*, GOM, USA

*T/V Mega Borg* incident in the US GOM. Photo: NOAA.

On 8 June 1990, the *Mega Borg* was disabled by a fire and explosion in the Gulf of Mexico, 57 miles (92 km) southeast of Galveston, TX in international waters. The ship then drifted while leaking burning oil for several days before the fire was extinguished. Estimates indicate that between 300-1,000 barrels (12,000-40,000 gallons; 45–150 $m^3$) of light crude oil were released into the water and did not burn. The use of Corexit© 9527 was authorized within five nautical miles (9 km) of the stricken vessel to treat the rapidly spreading surface oil. Six dispersant applications over a five-day period totaling ~300 barrels (11,300 gallons; 43 $m^3$) were determined to be effective on the crude oil surface slicks (NOAA, 1992).

### 1993 — *M/V Braer*, Shetland, Scotland, UK

The *Braer* foundering off Shetland, Scotland. Photo: www.thetimes.co.uk.

On 5 January 1993 the *M/V Braer* ran aground very close to shore at Garth's Ness, Shetland, Scotland during heavy weather. Over a 12 day peroid nearly all of its 600,000 barrel (25 million gallons; 95,000 $m^3$) cargo of Norwegian Gullfaks crude oil and its heavy bunker oil were released as the ship broke apart. Conditions prevented mechanical recovery, but during calmer periods 1,000 bbl (42,000 gallons; 130 $m^3$) of dispersant (Dasic) was applied.

The *M/V Braer* was unusual because no large surface slick was produced and cleanup was minimal for the volume spilled, primarily because of the very energetic conditions of the wind and waves. The oil was effectively dispersed both naturally and by the addition of dispersants. This incident demonstrated that dispersion can prevent effects associated with a floating slick (Kingston, 1999).

### 1995 — International Convention on Oil Pollution Preparedness, Response, and Co-Operation (OPRC)

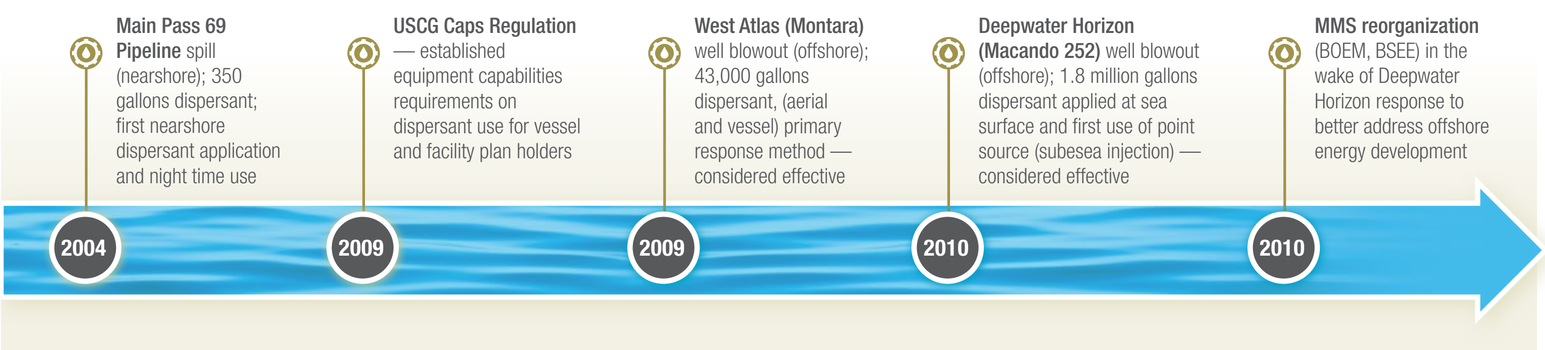
OPRC is the first overarching international agreement dealing with **response** to marine pollution. It was adopted by IMO in November 1990 and became international law in May 1995. The Convention is designed to:

- Help governments prepare for and respond to major oil pollution incidents
- Facilitate international co-operation and mutual assistance relative to a major oil pollution incident
- Encourage States to develop and maintain an adequate capability to deal with oil pollution emergencies.

### 1996 — *M/V Sea Empress*, Milford Haven, Wales, UK

On 15 February 1996, the *M/V Sea Empress*, carrying roughly 460,000 bbl (19.5 million gallons; 74,000 $m^3$) of forties crude oil and 2,300 bbl (100,000 gallons; 370 $m^3$) of heavy fuel oil ran aground and released its cargo. This incident was the first to be monitored promptly and in detail. Methods used included two aircraft equipped with Side Looking Airborne Radar (SLAR), downward looking video, as well as Infrared (IR)

**FIGURE 1(E).** Timeline of dispersant use and subsequent regulatory changes: **2004 – 2010**




*M/V Sea Empress* vessel casualty. Photo: www.walesonline.co.uk.

and UV cameras. Modeling was also used to assist in planning. Approximatley 2,800 bbl (120,000 gallons; 444 m³) of Corexit© and Dasic© dispersants were applied and research indicated that a significant amount of emulsified oil formation was prevented. This likely served to prevent oiling of wildlife and commercially important beaches and served to demonstrate the potential that dispersant use offers (White and Baker, 1998).

### 1998 — *M/T Red Seagull* tanker, Galveston, TX, USA

The *M/T Red Seagull* began leaking light crude oil while anchored in the Galveston Lightering Area and released a total of 400 bbl ( 17,000 gallons; 64 m³) of oil. After the leak was repaired it was estimated that 100 bbl (4,200 gallons; 16 m³) of oil were trapped under the ship. As a response measure and also a demonstration of the ability of fire monitors to be used for application of dispersants, an estimated 20-30 bbl (840-1,260 gallons; 3-5 m³) of oil were effectively treated with 80 gallons Corexit© 9500. This application demonstrated the proof of concept for using a modified fire monitor to apply dispersant. Additionally, effective dispersion of the surface oil was reported. (Henry, 2005).

### 2000 — Poseidon Pipeline Discharge, GOM, USA

On 21 January 2000, a 24” (0.61 m) crude oil pipeline that transports oil from offshore to onshore facilities experienced a pipeline failure and leak approximately 65 miles (105 km) south of Houma, Louisiana. The spilled oil was within a pre-approval zone for dispersant use and met all US EPA Regional Response Team requirements for authorization.

Over a two-day period, approximately 140 bbl (6,000 gallons; 23 m³) of Corexit 9527 dispersant was applied to the surface slicks. An estimated 75% effectiveness rate was observed for the first day of applications. Using the required analytical protocols, on-water dispersant monitoring efforts verified that the dispersant application had been effective. Once the dispersant appeared to lose its effectiveness as the oil weathered (for more information, see **Fact Sheet 3: Fate of Oil and Weathering**), dispersant operations were halted. This dispersant application was considered to be highly successful and documented by both visual observation and analytical methods based on fluorometry measurements (Henry, 2005).

### 2004 — Main Pass 69 Pipeline, Louisiana, USA

On 15 September 2004, Hurricane Ivan damaged the Main Pass 69 pipeline where an 18 inch (0.46 m) and a 20 inch (0.51 m) pipeline crossed; both lines were damaged and leaked crude oil. The leak continued for 20 days until the source was controlled. An estimated 7,000 bbl (300,000 gallons; 1,140 m³) of oil may have been released.

Due to the location of the release site, the US Fish & Wildlife Service noted that approximately 2,000 birds on an exposed sandbar were at immediate risk from the oil and thousands of other birds were potentially at risk in the general area. Given that the spill location was outside the existing pre-authorization zone, specific approval was required to proceed with dispersant use. This was granted and dispersants were applied in areas where oil escaped the recovery operations and presented a direct risk to wildlife and sensitive habitat. A total 8 bbl (350 gallons; 1.3 m³) of Corexit 9527 and 120 bbl (5,000 gallons; 19 m³) of Corexit 9500 were applied on two different days. While dispersant effectiveness received mixed reports, this represented the first time dispersants were applied in nearshore waters since OPA 90 was enacted (Henry, 2005).

### 2009 — US Coast Guard CAPS Regulation

The USCG initiated the "CAPS" rule (Vessel and Facility Response Plans for Oil: 2003 Removal Equipment Requirements and Alternative Technology Revisions) in 2009, making dispersant capability a regulatory requirement for vessels and facilities planning in the US by 2011. The CAPS rule enhances the existing response requirements by requiring advance contracts for dispersants and related delivery equipment; and, aerial tracking and trained observation personnel.

### 2009 — Montara Well Blowout, East Timor Sea, Australia

The Montara Wellhead Platform casualty. Photo: AMSA.

On 1 August 2009 the Montara wellhead platform off of the northwestern Australia in the East Timor Sea had a blowout, releasing oil and gaseous hydrocarbons into the environment. The discharge continued for 10 weeks until the well was killed on 3 November and capped by 3 December, 105 days after the initial blowout. The incident response was challenged since the platform was located 140 nautical miles (260 km) from shore.

Initial estimates were that the well was releasing approximately 400 bbl (17,000 gallons of oil; 65 m$^3$) per day, but later estimates ranged from 400 to 3,000 bbl (17,000 to 126,000 gallons; 65 to 4,800 m$^3$) per day. Over the duration of the incident, the majority of the oil remained within 19 nautical miles (35 km) of the platform (AMSA, 2010).

Aerial dispersant operations began on August 23rd and continued through November 1st. Seven types of dispersants were applied during this period — approximately 1,160 bbl (48,600 gallons; 184 m$^3$) — using aerial and vessel spraying operations. It was eventually concluded that in this response, the use of dispersants "*was highly effective in assisting the natural process of biodegradation and minimising the risk of oil impacts on reefs or shorelines*" (AMSA, 2010).

### 2010 — Deepwater Horizon Blowout, GOM, USA

On 20 April 2010 the Deepwater Horizon drilling platform, located approximately 47 miles (87 km) offshore of Louisiana in the Gulf of Mexico, suffered a blowout that resulted in an explosion and fire killing eleven people. The platform eventually sank.

The resulting spill was the largest marine oil spill in US history, and while estimates vary, the US Government's estimates that the volume released was 4.9 million barrels (205 million gallons; 780,000 m$^3$) (Lehr et al., 2010) and the operator's estimate is 2.45 million barrels (102.9 million gallons; 389,500 m$^3$) (Post-Trial Memorandum, 2013).

The Deepwater Horizon Platform on fire. Photo: USCG.

Numerous response techniques were used, including the application of 43,000 barrels (1.8 million gallons; 6800 m$^3$) of dispersant. Approximately 18,000 barrels (770,000 gallons; 2,900 m$^3$) of which were applied through subsurface injection at the source of the leak at the seafloor (National Commission, 2011; Lehr et al., 2010). For additional information on the use of dispersants in a subsea application, see **Fact Sheet 8 — Subsea and Point Source Dispersant Operations**.

This spill response continues to be the most studied in US history. The use of dispersants is considered to have been effective in the water column for enhanced biodegradation (Camilli et al., 2010; Hazen et al., 2010); however the full environmental effects continue to be studied. Numerous research projects are studying long-term and short-term effects of the oil, dispersant, and the dispersant-oil mixture. Studies range from overall environmental effects, to individual species DNA level effects.

### 2010 — Minerals Management Service (MMS) Reorganization

The Minerals Management Service was created on 19 January 1982, consolidating components from the U.S. Geological Survey, the Bureau of Land Management and the Bureau of Indian Affairs. In the wake of the Deepwater Horizon response, the President of the US tasked the Secretary of the Department of the Interior to conduct a fundamental restructuring of MMS to divide its three conflicting missions into separate entities with independent missions. The new divisions include:

- **Bureau of Ocean Energy Management** (BOEM): responsible for managing environmentally and economically responsible development of the nation's offshore resources.
- **Bureau of Safety and Environmental Enforcement** (BSEE): responsible for ensuring safety and environmental oversight of offshore oil and gas operations, including permitting and inspections, of offshore oil and gas operations.
- **Office of Natural Resources Revenue** (ONRR): responsible for the royalty and revenue management of all revenues associated with both federal offshore and onshore mineral leases.

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