

RESPONSE OPERATIONS TO THE UNION FAITH RELEASE

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ABSTRACT: On August 4, 1999, U.S. Coast Guard Marine Safety Office (MSO) New Orleans pollution investigators responded to a chronic sheen appearing adjacent to the Riverwalk, New Orleans' popular riverfront shopping and tourist destination. The oil eventually was identified surfacing near the middle of the Mississippi River. A bottom survey conducted by the MSO and U.S. Army Corps of Engineers (ACOE) utilizing side-scanning sonar, magnetometers, and fathometers identified a large anomaly that was later determined to be the Taiwanese-flagged freighter Union Faith. On April 6, 1969, this vessel had been involved in a tragic collision and subsequently sank with an estimated 6,000 barrels of bunker fuel onboard.

Removing heavy oil from a badly deteriorated wreck with zero visibility and dangerous currents proved an enormous challenge. Repeated attempts to locate the source of oil within the ship's maze of holds were unsuccessful and internal recovery efforts proved extremely problematic. External hull operations were determined to be the most effective way to remove the oil. This strategy entailed charting the boundaries of the trapped oil and then cold tapping through the hull at strategic locations. A specially designed drilling and pumping apparatus was then subsequently placed at these cold tapped areas. Also, three internal tanks were accessed externally and emptied of their contents.

Other obstacles to overcome were staging a diving support platform in the middle of a congested waterway serving one of the busiest ports in the world, sensitivity to a ship designated as a "watery grave" for 26 deceased mariners, and managing a high level of publicity/scrutiny surrounding an effort of this scale underway directly in front of a major tourist attraction, cruise ship moorings, ferryboat landings, and a local TV station's corporate office.

The ship, her cargo, and final resting place

The *Union Faith* was a general cargo freighter of medium size: 7,301 GT (gross tons), 503.25 feet length overall, and breadth of 64.11 feet (Figure 1). The vessel was built in 1942, had five cargo holds, and its propulsion power was by a steam-gear turbine. Upon arrival to New Orleans, Louisiana prior to the collision, the *Union Faith* was laden with general cargo including high-density baled cotton, paper rolls, rubber footwear, plastic flowers, iron wire rolls, and sheets of plywood. In addition, the vessel carried 696 tons of bunker fuel plus an estimated 26 tons of diesel fuel onboard (USCG, 1969). The vessel currently rests on the bottom of the Mississippi River, approximately 100 yards downriver from the Greater New Orleans Bridge, lying on her port side beam with her bow heading upriver, her decks facing the right

descending bank, and her bottom plating facing the left descending bank.

The collision

About 7:15 p.m. on April 6, 1969, the upbound freight vessel *Union Faith* collided with the barge *IOC No. 7*, which was downbound and being pushed by the towing vessel *Warren J. Doucet*. The *IOC No. 7* was the lead barge of a tandem tow of three tank barges, each loaded with approximately 9,000 barrels of crude oil. The total length of the tow was about 705 feet. The tug *Cay & Mitch* was made up to the port quarter of the lead barge with her engines operating at about one-quarter speed. The tow proceeded at about 3.8 knots and was favoring the bends (NTSB, 1969).

The *Union Faith* had 51 persons onboard at the time of the incident, including the pilot and vessel's master. The remaining 49 individuals were Taiwanese crewmembers. The vessel was bound for a berth about 3 miles from the Greater New Orleans Bridge. She proceeded from anchorage off Algiers Point, favoring this point, and was making good about 10 knots as she cleared the point and headed upstream. Her anchors were on the break, ready to let go, and was being navigated by a licensed pilot (MNSA, 1995).

The collision occurred just after nightfall, slightly upstream from the Greater New Orleans Bridge on the left descending bank side of the river. The *IOC No. 7* caught fire on contact and broke loose from the tow. A series of explosions followed almost immediately, and the *Union Faith* was quickly engulfed in flames (Figure 2). The barge broke into two sections, which drifted down the river ablaze and later sank. Crude oil released from the *IOC No. 7* burned on the river and threatened nearby moored vessels and harbor facilities. The *Union Faith* continued to drift downriver while burning from stem to stern and eventually sank at about 2:00 a.m. on April 7, 1969. Twenty-five persons aboard the *Union Faith*, including all personnel on the vessel's bridge at the time of the casualty, were killed in the incident and went down with the ship (Figure 3).

A hazard to navigation

Although the *Union Faith* sank in 112 feet of water, only a depth of 55 feet covered the ship because of its massive hull extending to the surface. In 1970, the method chosen by the U.S. Army Corp of Engineers (ACOE) to be the quickest solution to remove this navigational hazard and least likely to cause oil to leak from the vessel, was burial of the ship into the Mississippi

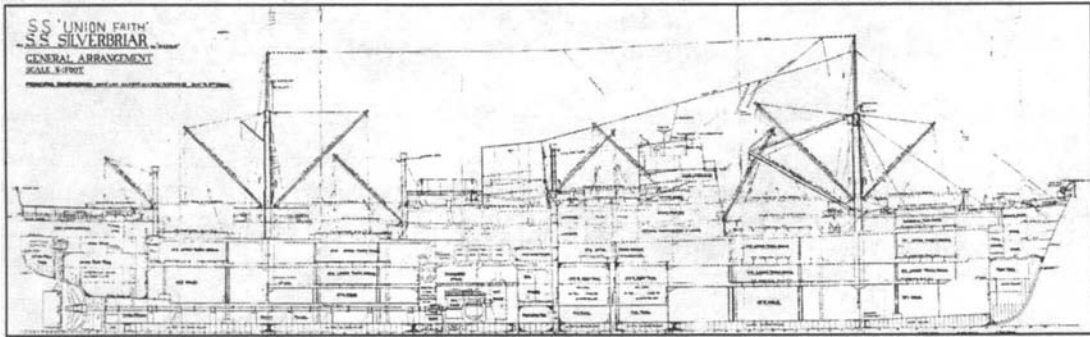


Figure 1. General arrangement of the *Union Faith* and its sister ship the *Silverbriar*.

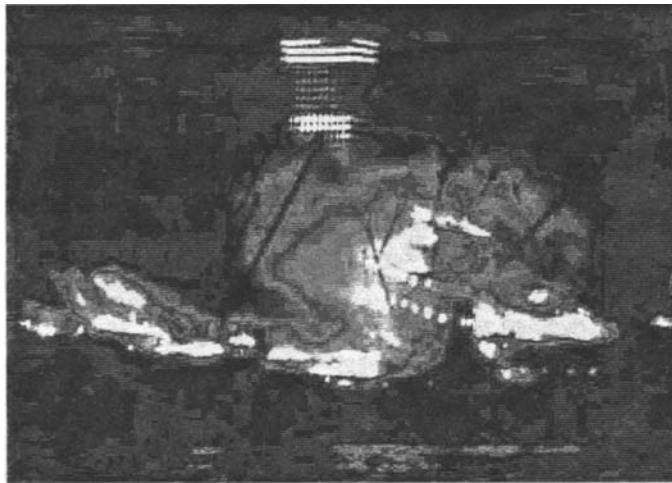


Figure 2. The *Union Faith* engulfed in flames.

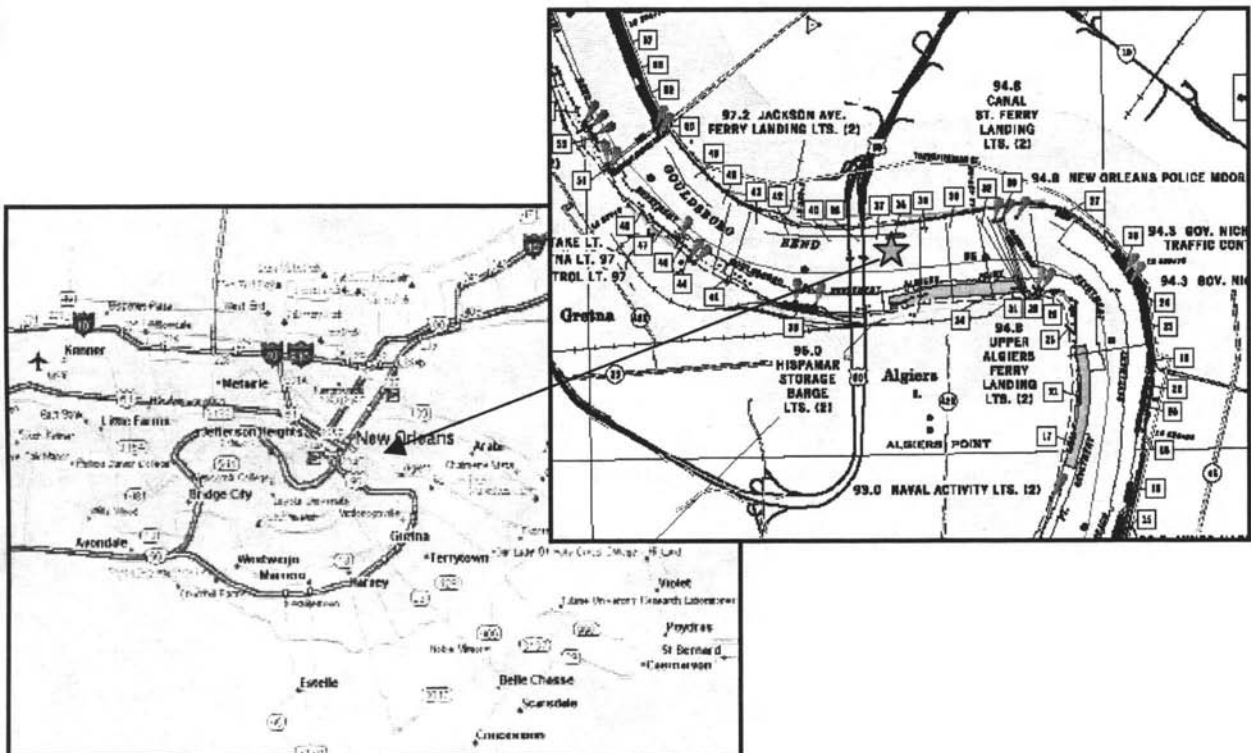


Figure 3. Location of the *Union Faith* sinking.

River's bottom. This plan was executed in three phases: (1) removal of the ship's superstructure to the weather deck level, (2) excavation of a trench adjacent to and extending the length of the vessel, and (3) undercutting the earth beneath the vessel to cause the ship to slide into the trench.

On August 17, 1970, a crew of seven divers using electric arc-oxygen torches began work to burn off the *Union Faith's* booms, masts, kingposts, and other pieces of its superstructure. When this operation was completed, a crane rigged with a special cable atop a derrick barge was utilized to saw off the sunken ship's superstructure to the weather deck. After the superstructure was removed, excavation began on a 100-foot wide by 50-foot deep trench that extended the entire length of the vessel. The dredging operations took 38 days, and most of the excavating was accomplished using an 8-yard capacity clam bucket specially weighted to overcome current drag. The *Union Faith* successfully slid into its trench early Saturday morning on October 31, 1970 and soundings that same day showed all parts of the vessel were well under the minimum required depth of 55 feet below the river's surface (Ingram, 1970). None of the oil onboard the ship at the time of the sinking was removed because of concerns that a catastrophic release could occur. In addition, a marine survey of the vessel determined that after burial into the river bottom, sediments would eventually cover the ship and thereby effectively "capping" any future releases of product (Bachrach and Wood Associates, 1970).

The response 29 years later

On August 4, 1999, a local television station called U.S. Coast Guard Marine Safety Office (MSO) New Orleans reporting oil in the Mississippi River adjacent to the Riverwalk, New Orleans' popular riverfront shopping, cruise ship terminal, ferry boat landing, and tourist destination. MSO New Orleans pollution investigators responding found a light sheen of oil but the source remained a mystery. Over the next few days, the chronic sheen became steadily heavier, but the source still continued to escape detection until river patrols conducted by MSO personnel eventually identified oil surfacing near the middle of the Mississippi River, just downstream of the Greater New Orleans Bridge.

Local mariners in the area reported to MSO pollution investigators that the sheening began shortly after the ACOE had completed dredging operations in the vicinity of the Riverwalk area. This information indicated the possibility that the source of the sheening may be from disturbed river sediments; however, when the sheening persisted and even worsened over the next few days, concern arose that maybe an unknown object on the river bottom was disturbed or ruptured during dredging operations. The oil eventually began collecting approximately 500 yards downstream along the east bank at the Governor Nichols Street Wharf and both deflection and containment booms were subsequently deployed at this site to capture and contain the oil.

On August 13, 1999, MSO New Orleans and the ACOE conducted a joint bottom survey of the previously dredged area utilizing side-scanning sonar, magnetometers, and fathometers to determine possible sources. The survey team found no anomalies in the area where dredging had previously occurred. But when the survey extended well outside of the previously dredged area, a very large object was found situated in the middle of the Mississippi River, approximately 150 yards down river from the Greater New Orleans Bridge and in the vicinity of where the oil was observed surfacing (Figure 4).

Analysis of side-scan sonar imagery led MSO New Orleans' personnel to suspect that the source of the oil might be the sunken

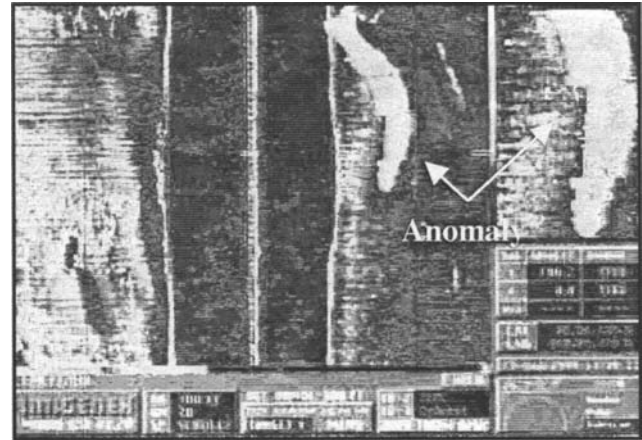


Figure 4. U.S. Army Corps of Engineers' side-scan sonar imagery.

freighter *Union Faith*. Following this theory, the Oil Spill Liability Trust Fund (OSLTF) was accessed to contract commercial divers to verify the identity of the submerged object and determine if it was the source of the persistent oil leak. By the third dive, it was positively confirmed that the underwater object was the *Union Faith* and that it was the source of the leaking oil. Divers found the wreck lying on its portside beam, bow upstream, with approximately 25 gallons of oil per day escaping through an extensive hull fracture located amidships and extending below the mudline (Figure 5).

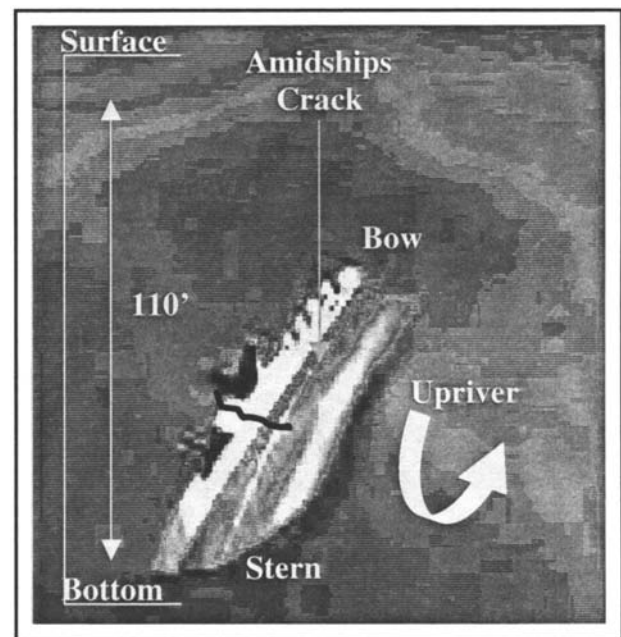


Figure 5. *Union Faith* river bottom orientation.

Dive operations

The next course of action was to determine the source of the leak within the ship, and this entailed staging a deck barge as a long-term dive support platform in the middle of a congested waterway serving one of the busiest ports in the world. This enormous challenge was overcome by establishing a safety zone that extended the entire width of the river and prohibited passage

of deep-draft vessel traffic when divers were in the water and mandated one-way only traffic at all other times. MSO New Orleans also established a temporary Vessel Traffic Management Service using the existing Algiers Point traffic management lights as well as on-site personnel to coordinate the timing between diving operations and deep draft vessel transits.

Penetration dives through the amidships crack and into the bowels of ship were needed in order to determine the location of the leak. A camera providing live video feed was mounted to the diver's helmets and aided the dive master and other response personnel in managing underwater activities. Divers first discovered settling tank 3B was breached and had free communication with the river. Also, large amounts of oil were found accumulated within the void spaces between numerous transverse bulkheads beneath settling tank 3B. These accumulations were easily disturbed, further limiting visibility and hindering efforts to locate where the source of the leak was originating. Submersible pumps were utilized to remove these accumulations of oil before divers could continue further. Following the source of the leak through the ship's dark maze of the transverse bulkheads and tight crawl spaces eventually led divers to the vessel's large machinery space. Here it was discovered that multiple sources of oil were slowly leaking into this area and that over the years, had accumulated into large pockets along the hull until it began to escape to the surface. Tanks in the vicinity of the machinery space identified as the most probable sources or contributors to the leak were the starboard settling tank, aft deep tank, and double bottom tank. Each of these tanks were drilled and found to contain product.

Once the source of the oil was isolated to the machinery space and the adjacent tanks, review of possible solutions to mitigate the situation were reviewed and discussed. MSO New Orleans determined that raising or salvaging the vessel would not be an option because of the risk of a catastrophic release of oil from the poor structural condition of the ship, the dangers, high costs, and disruption to vessel traffic and commerce that would ensue from a salvage operation of this scale, and respect for the site as a watery grave for deceased mariners.

Strict adherence to nondecompression U.S. Navy Dive Tables limited bottom time to 30 minutes. From the surface, divers needed approximately 15 minutes to reach the *Union Faith's* machinery space and this left only 15 minutes within the machinery spaces to man submersible pumps and actively recover oil before having to return to the surface. Despite recovering an estimated 5,950 gallons of pocketed oil from within the machinery space, continued internal recovery operations of heavy, viscous oil from the badly deteriorated wreck with almost zero visibility and dangerous currents soon proved to be a hazardous, time consuming, extremely problematic, and inefficient process.

Drilling and pumping operations

It was then determined that the most effective and safe way to remove the oil and stop the leak was via external hull operations. This strategy entailed internal and external charting of the boundaries of the trapped oil along the hull of the machinery space and then subsequent cold tapping and drilling through the hull at strategic locations to pump the product out. A&B Concrete and Coring engineered a special drilling and pumping apparatus to accomplish this task. In addition to the pockets of accumulated oil along the hull, the starboard settling tank, aft deep tank, and double bottom tank also were to be accessed externally and emptied of their contents.

Four areas of the *Union Faith's* half-inch steel hull outside of the machinery space were marked for drilling and pumping op-

erations. For each area to be accessed, four holes were to be cold tapped followed by placement of a rubber gasket to this area of the hull and secured with epoxy cement. The drill press collar (Figure 6) was then positioned over this gasket and attached to the hull by toggle bolts placed through its four securing points

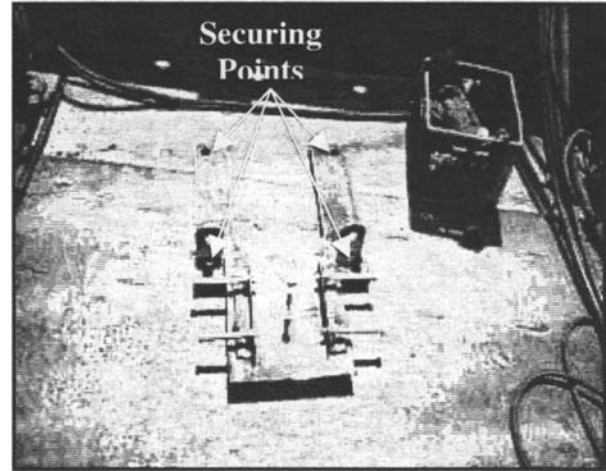


Figure 6. Drill press collar.

and corresponding holes previously cold tapped. Once the drill press collar was in place, an additional gasket was installed over the drill press collar and the valve piece was bolted to the press collar via its base plate. Next, the hydraulic drill press was fastened to the press collar and its 3-inch drill bit secured into valve piece's rising stem gate valve (Figure 7). After the hull had been drilled with the 3-inch drill bit, the gate valve was shut and

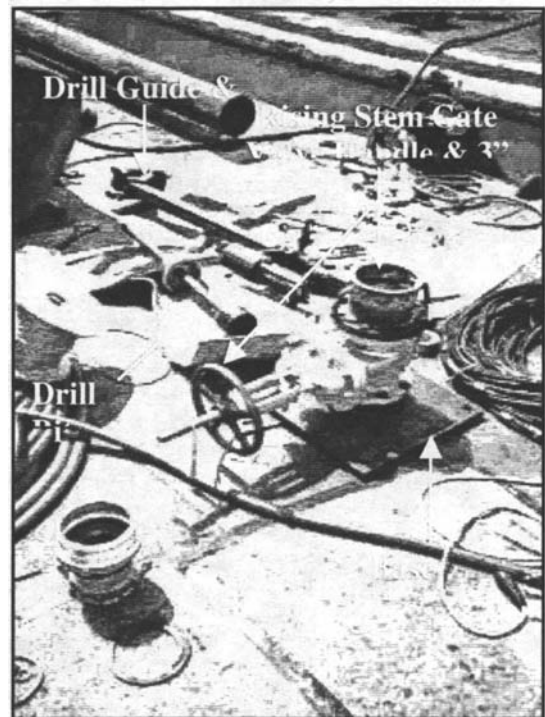


Figure 7. Valve piece close-up.

the drill bit removed. Then, 3-inch discharge hose was cam-locked to the emission end of the gate valve, the gate valve was opened and the product was recovered utilizing hydraulically driven submersible centrifugal pumps. Because of the high viscosity of the product and 60-foot plus discharge head, two submersible pumps had to be used inline. A 500-barrel frac tank was staged on a deck barge and brought alongside the dive platform as a temporary storage device. Decanting into boom was authorized to allow elimination of excess water from the frac tank.

On September 24, 1999, despite initial equipment problems and difficulties encountered penetrating the hull, the first successful cold tap into the hull of the *Union Faith* was completed. Two days later on September 26, 1999, pumping operations commenced and removed 1,904 gallons of pure product in just over 2 hours before the pumps began to recover water. On September 30, 1999, a second cold tap was completed, and that same day pumping operations removed an additional 1,512 gallons of pure product in just over 45 minutes before the pumps began to recover water. High-pressure air injected into the machinery space through the first cold tap to force removal of oil adhering to the hull in an effort to increase recovery amounts ultimately proved unsuccessful. The third and fourth cold taps coupled with the emptying of the starboard settling tank, aft deep tank, and double bottom tank yielded an additional 7,434 gallons of product for a total of 16,800 gallons of product recovered. At the conclusion of the operation on October 7, 1999, each cold tap was replaced with permanent ball valves to facilitate future pumping operations if needed.

Public affairs

MSO New Orleans was faced with numerous public affair challenges during this entire evolution. The high level of publicity and scrutiny surrounding an effort of this scale underway directly in front of a major tourist attraction, cruise ship moorings, ferryboat landings, and a local TV station's corporate office demanded the execution of an organized and coherent media communications campaign that anticipated, and not merely reacted to, the rapidly changing informational needs of the media. During the height of the media blitz, tours of the response and newspaper, radio, and television interviews were conducted daily for almost 2 weeks. When new information was available or deemed of interest to the media, MSO New Orleans initiated contact with the media. In addition, MSO New Orleans remained extremely flexible and accommodating to the media's last minute requests for video footage, information, and interviews in order to accommodate their deadlines. This was recognized and appreciated by the news media, which helped foster a cooperative relationship and aided in the Coast Guard's response efforts always being projected in a positive light.

The pilot of the vessel that died when the ship sank was Captain Scarbrough, and the deceased pilot's family voiced strong

concern that his final resting-place not be disturbed. To help the family reach closure and help ease this delicate situation, Coast Guard Captain of the Port Stephen W. Rochon arranged for several Scarbrough family members to accompany him on a scheduled site visit where they were able to see the dive support platform and met with the divers who had explored the wreck. When the visit was completed, CAPT Rochon and the family members then laid a wreath in memory of Captain Scarbrough.

Conclusions

At the completion of this \$1.1-million response, which spanned a period of almost 3 months, over 200 dives were safely completed, more than 400 barrels of heavy fuel oil were successfully removed, over 1,200 vessel traffic movements orchestrated without incident, and the oil leak was eventually stopped. In addition, permanent valve fittings were left on the vessel's hull, which will greatly simplify potential future recovery operations if needed. Although the \$1.1-million amount of the response may seem high, the dollar cost per gallon of oil recovered was \$63.60. This cost per gallon recovered is extremely efficient and very economical when compared to other responses.

Biography

LT Michael C. Long is a 1990 graduate of the University of West Florida where he earned a B.S. in Environmental Studies. He graduated from Coast Guard Officer Candidate School in 1992. His previous assignments were at the National Response Center and Gulf Strike Team. He is currently stationed at MSO New Orleans.

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