NATIONAL TRANSPORTATION SAFETY BOARD

Marine Accident Brief Report
DCA95MM012

Fire On Board the U.S. MODU ROWAN ODESSA Gulf of Mexico December 1, 1994

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PB96-917007
NTSB/MBR-96/01

Abstract: This brief report explains the accident that resulted when workers struck and ruptured a submerged natural gas pipeline while positioning a mobile offshore drilling unit, the ROWAN ODESSA, in the Gulf of Mexico. Escaping gas ignited, engulfing the drilling rig in flames. The rig manager remains missing and is presumed dead. Damages to the drilling unit and the pipeline were estimated at $13 million.

As a result of its investigation of this accident, the Safety Board made one new safety recommendation and reiterated one safety recommendation to the U.S. Coast Guard.

The National Transportation Safety Board is an independent Federal agency dedicated to promoting aviation, railroad, highway, marine, pipeline, and hazardous materials safety. Established in 1967, the agency is mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable cause of accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The Safety Board makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

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EXECUTIVE SUMMARY

On December 1, 1994, the ROWAN ODESSA, a U.S. flag jack-up mobile offshore drilling unit (MODU) with a crew of 37, had just completed a work assignment in the Gulf of Mexico and was being towed by two tugs to an area where it was to spud down until its next assignment. About 0100 CST on the following day, while the ROWAN ODESSA was being maneuvered into a position, its port leg struck a submerged 16-inch natural gas pipeline. Escaping gas bubbled up around the leg and enveloped the MODU. The rig manager ordered the crew to evacuate, directed the tugs to move the rig off location, and began to raise the MODU's legs. Shortly thereafter, the escaping gas ignited near the port leg, probably as a result of the electric motors mounted on the leg. Almost immediately, the rig was engulfed in flames. The 36 crewmembers who had evacuated the rig were recovered by one of the tugs. The rig manager remains missing and is presumed dead. Damages to the MODU and the pipeline were estimated at $13 million.

Description of the Accident

On December 1, 1994, the ROWAN ODESSA, a U.S. flag jack-up mobile offshore drilling unit (MODU) with 37 persons aboard, departed South Timbalier Block 34[1] in tow of a lead tug, the NITA T, and an assist tug, the HARVEY COMMANDER. The ROWAN ODESSA had just completed a work assignment. Its owner, Rowan Companies, Inc., had hired the two tugs to move the rig to Bay Marchand Block 4, where it was to be spudded[2] and hot-stacked[3] until the next work assignment. See Figure 1.

On the following day, the ROWAN ODESSA was being maneuvered into position in the Gulf of Mexico approximately 1 mile south of Belle Pass, Louisiana. About 0110,[4] the ROWAN ODESSA's port leg struck a submerged 16-inch natural gas pipeline. Escaping natural gas bubbled up around the port leg and enveloped the MODU.

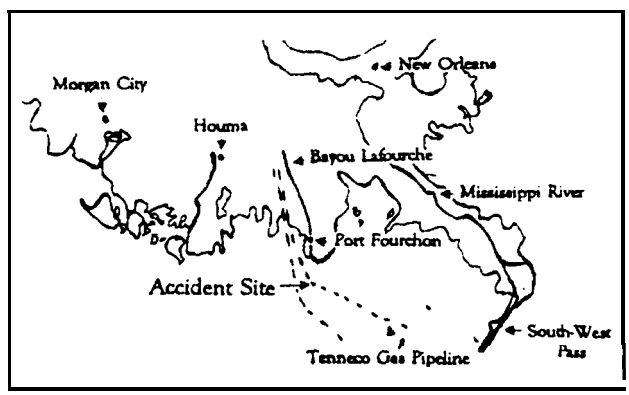

Figure 1 – Accident site.

The rig manager realized that a gas pipeline had been ruptured and ordered the rig evacuated. He radioed the assisting tugs and told them to prepare for moving the rig off location. He then began to raise the legs of the MODU. Shortly thereafter, the escaping gas ignited near the port leg, probably as a result of the electric motors mounted on the leg. Almost immediately, the rig was engulfed in flames.

[1] South Timbalier and Bay Marchand, located south of Belle Pass, Louisiana, are two of the many oil and gas lease sites managed by the Minerals Management Service, U.S. Department of the Interior. The block numbers, such as South Timbalier Block 35 or Bay Marchand Block 5 correspond to the lease numbers.

[2] Spudded is an industry term describing a barge that has anchored by lowering its legs to the bottom. When a jack-up MODU is spudded, the barge is normally lifted clear of the water.

[3] Hot stack is the term use for an anchored rig that is temporarily unemployed and has a full crew on board. Long-term anchorage with only a fire or security watch on board is called a cold *stack.*

[4] Central Standard Time based on a 24-hour clock.

Twenty men evacuated the rig in the starboard survival capsule. Fourteen men jumped from the helicopter pad, and two others jumped from the rig's bow. One of the attending tugs, the NITA T, recovered 36 men. The rig manager remains missing and is presumed to have drowned. Five of the men who jumped from the helicopter pad received minor injuries, including second- and third-degree burns, groin injuries, and one fractured knee cap.

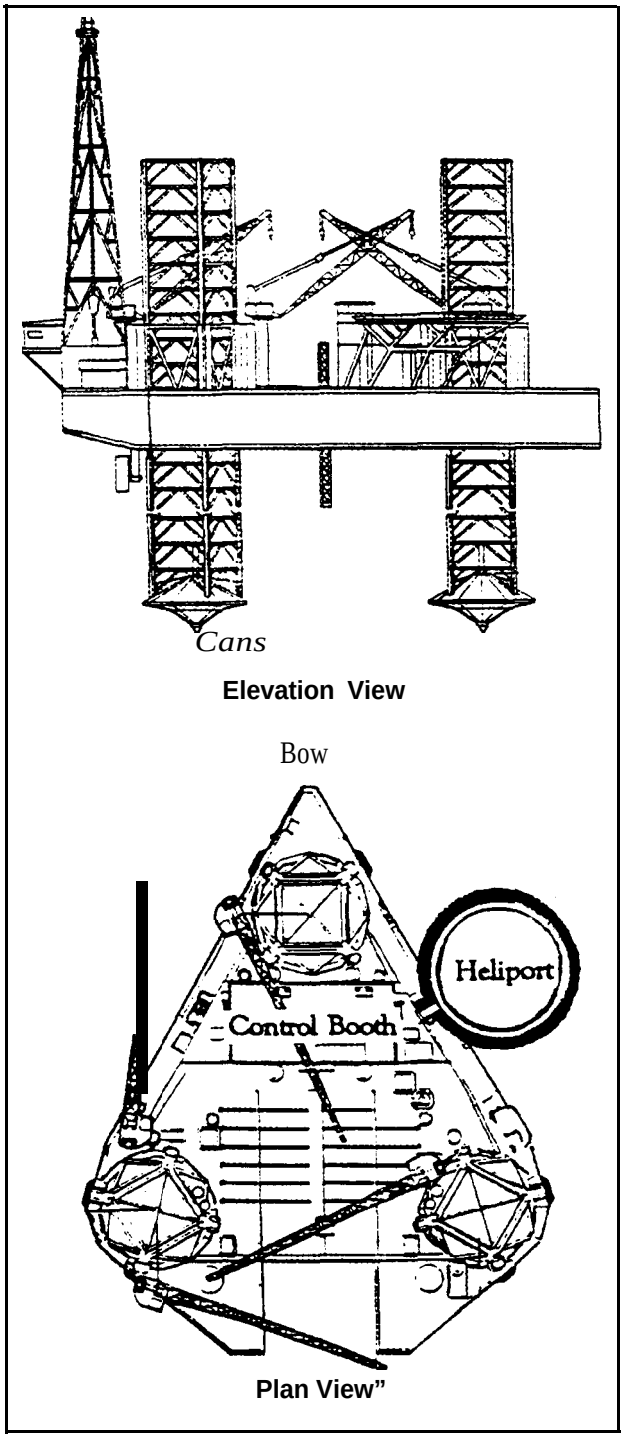

Figure 2 — The ROWAN ODESSA

This area, like many others in the Gulf of Mexico, is crisscrossed with submerged pipelines from numerous offshore oil wells, and the Gulf of Mexico has no designated pipeline-free areas where MODUs, liftboats, and other vessels in the offshore oil industry can anchor safely. In addition, although some charts show the major pipelines, many of the smaller pipelines do not appear on any standard navigation chart.

Because the NITA T was the lead tug in the tow, its master was responsible for navigation. He stated that he had used NOAA special-purpose chart 1116A, which is the chart most commonly used by the offshore industry for this section of the Gulf of Mexico. NOAA chart 1116A shows the offshore oil and gas lease blocks and the LORAN-C overprints, and it is practical and suitable for most offshore oil industry navigation. However, because it covers a large area, it does provide the detailed information, such as locations of pipelines or other obstructions, that is needed for anchoring or stacking a vessel.

NOAA chart 11357,[5] which also shows the accident area and the LORAN-C overprints, covers a smaller area and is drawn on a larger scale. It clearly shows the two major pipelines south of the Belle Pass sea buoy, including the one ruptured by the ROWAN ODESSA. Therefore, when vessels intend to anchor or spud down, the navigator should use charts that show greater detail, such as NOAA 11357.

Probable Cause

The National Transportation Safety Board determines that the probable cause of the accident, in which the ROWAN ODESSA ruptured the natural gas pipeline, is the lack of

[5] Because the NITA T is less than 1,600 gross tons and the ROWAN ODESSA is not self-propelled, the chart requirements of 33 CFR 164 do not apply.

designated pipeline-free areas in the Gulf of Mexico where MODUs, liftboats, and other vessels in the offshore oil industry can anchor safely. Contributing to the accident was the NITA T master's use of NOAA chart 1116A instead of NOAA chart 11357, which shows the location of the pipeline that was ruptured.

Safety Issues

During December 1994, about 110 jack-up MODUs and 40-50 liftboats were in the Gulf of Mexico. The U.S. Coast Guard has the authority to designate anchorage areas under 33 CFR 109 and 110, and it has the authority to regulate Outer Continental Shelf (OCS) activities under 33 CFR 140 through 147. However, the OCS in the Gulf of Mexico has no designated pipeline-free anchorages where out-of-service MODUs, liftboats, and other offshore oil industry vessels can safely anchor or spud down. Furthermore, no Coast Guard or Minerals Management Service[6] (MMS) regulations address such activity.[7]

This accident probably would not have occurred if a designated anchorage free of pipelines had been available, and similar accidents are likely in the future unless such anchorages are provided. The National Transportation Safety Board therefore believes that the Coast Guard, in consultation with the MMS, the Office of Pipeline Safety (OPS), the National Oceanographic and Atmospheric Administration, and the offshore oil industry, should identify and designate pipeline-free anchorage areas for mobile offshore drilling units, liftboats, and other industry vessels; these anchorages should be located near offshore oil and mineral industry staging ports throughout the Gulf of Mexico.

The Safety Board has investigated several accidents in which submerged pipelines were struck by MODUs or fishing vessels.[8] Because the safety of the subsea pipeline system has been questioned following such accidents, the MMS and the OPS commissioned the Marine Board of the National Research Council to study the technical, regulatory, and jurisdictional issues affecting the safety of marine pipelines in U.S. offshore waters. The study, which was published in 1994, notes that 20,000 miles of submerged pipelines, much of them uncharted, lie along the U.S. coast of the Gulf of Mexico.[9] The study concludes that vessels and their gear constitute one of the most important risks to marine pipelines.

The accident involving the ROWAN ODESSA underscores the need for Coast Guard COTPs to know the number and location of all pipelines that traverse their zones. On September 11, 1990, as a result of the NORTHUMBERLAND investigation (footnote 4), the Safety Board issued Safety Recommendation M-90-62, which asked that the Coast Guard:

> Require all Captains of the Port to have access to information about the number, location, and owners of all submerged hazardous liquid and natural gas pipelines that traverse their zones.

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[6] In 1982, all OCS leasing by the U.S. Department of the Interior was consolidated within the MMS.

[7] The Coast Guard Captains of the Port (COTPs) require notification only if a rig is to be anchored in their zone indefinitely, and they may impose special requirements, such as minimum crew and anchor lights. There are no requirements if a rig, such as the ROWAN ODESSA, is to be anchored temporarily with a full crew on board.

[8] Pipeline Accident *Report--Fire on Board the F/V NORTHUMBERLAND and Rupture of a Natural Gas Transmission Pipeline in the Gulf of Mexico Near Sabine Pass, Texas, on October 3, 1989* (NTSB/PAR-90/02); Pipeline Accident Brief--Accident involving the menhaden fishing vessel SEA CHIEF and an offshore CSX pipeline in the Gulf of Mexico on July 24, 1987 (NTSB/DCA-87-FP-013); Pipeline Accident *Report--Southern Natural Gas Pipeline Company Rupture and Fire of a 14-inch Gas Transmission Pipeline Southeast of New Orleans, Louisiana (Offshore), July 15, 1979* (NTSB/PAR-80/01); Marine Accident Report--Crane *Barge C.L. DILL 10 Fire in Garden Island Bay, Mississippi River Delta, on June 5, 1979* (NTSB/MAR-80/09).

[9] Committee on the Safety of Marine Pipelines, Marine Board of the National Research Council, *Improving the Safety of Marine Pipelines*, 1994, p. v.

On May 22, 1991, the Coast Guard replied that it concurred with the recommendation. The Coast Guard stated:

> The DOT is fully aware of the need to create a national inventory system for oil pipelines. Since pipelines do not fall within the purview of the Coast Guard, the Office of Pipeline Safety is preparing a regulatory package that covers an inventory of pipelines. This inventory will be a useful tool for the Coast Guard in contingency planning and discharge response activities. In the interim, before this regulatory package is completed, Section 4202 of OPA 90 provides the authority for having such information reported to the Coast Guard, or EPA as appropriate, as part of the required facility response plans.

On October 22, 1991, Safety Recommendation M-90-62 was classified "Open--Unacceptable Response." The Safety Board stated:

> The Safety Board understands the role of the Joint Task Force on Offshore Pipelines in creating a national inventory system for oil and gas pipelines in U.S. waters. However, it will be perhaps years before the inventory is completed. The Safety Board continues to believe that the Coast Guard in the meantime should require that all COTPs either compile the recommended information or be capable of contacting the owners or operators of pipelines in their zones at any time, day or night. We note from the Coast Guard's response that OPA 90 provides the authority for having such information reported to the Coast Guard as part of the required facility response plans. Therefore, we strongly urge the Coast Guard to initiate action to compile the recommended information. We would appreciate a further response from the Coast Guard on this matter.

On March 23, 1994, the Coast Guard again expressed its concurrence with this recommendation. The Coast Guard stated:

> The Office of Management and Budget recently disapproved the OPS regulatory package that would have included a requirement for facilities handling hazardous liquid and natural gas to inventory all submerged pipelines. OPS has no plans to pursue this aspect of their regulatory package, and until pipeline inventories are required, such information will not be available to the COTPs. Since the Coast Guard is unable to implement this recommendation without the applicable OPS rules, I request that this recommendation be classified "Closed--Reconsidered."

On May 30, 1990, then Secretary of Transportation Skinner noted in his response to companion Safety Recommendation P-90-4 that the MMS has a complete file on each of the pipelines it has authorized, whether under an OCS oil and gas lease, a right-of-use and easement, or a right-of-way. The file consists of maps, records, and a data base. The Secretary also noted that every approved OCS pipeline has been plotted on maps that are maintained at the regional director's office of the Gulf of Mexico OCS Region. The information on each pipeline includes the owner/operator, approval date, construction date, diameter, length, originating and ending points, reported burial depth, other pipelines crossed, product transported, and modifications and repairs.

Based on the former Secretary's 1990 letter, on the authority granted the Coast Guard by OPA 90 (Section 4202, Facility Response Plans), and on the Port and Waterway Safety Act, the Safety Board believes that the requirements of M-90-62 can and should be implemented. The Board urges the Coast Guard to reconsider its position on this issue. Pending a further reply, M-90-62 will remain classified "Open -- Unacceptable Response. "

Recommendations

The National Transportation Safety Board recommends that the U.S. Coast Guard:

In consultation with the Minerals Management Service, the Office of Pipeline Safety, the National Oceanographic and Atmospheric Administration, and the offshore oil industry, identify and designate, near offshore oil and mineral industry staging ports throughout the Gulf of Mexico, pipeline-free anchorage areas for mobile offshore drilling units, liftboats, and other industry vessels. (Class II, Priority Action) (M-95-31)

In addition, the National Transportation Safety Board reiterates Safety Recommendation M-90-62, which asked that the U.S. Coast Guard:

Require all Captains of the Port to have access to information about the number, location, and owners of all submerged hazardous liquid and natural gas pipelines that traverse their zones.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

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September 22, 1995