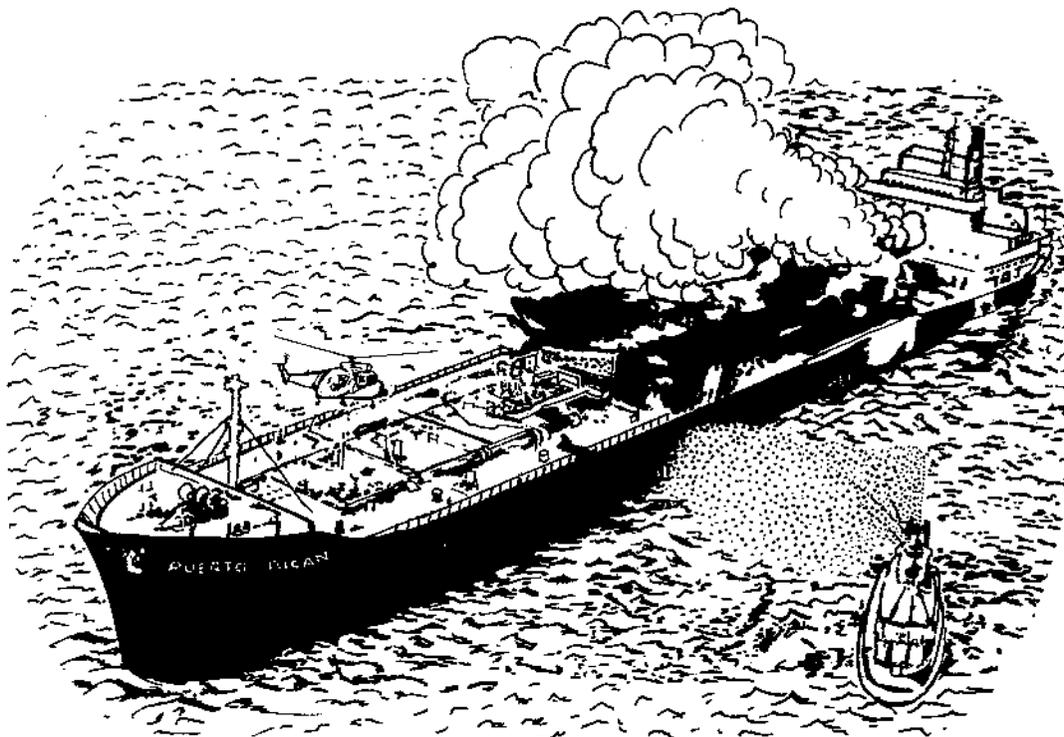


**ANALYSIS OF THE PUERTO RICAN  
TANKER INCIDENT**

**RECOMMENDATIONS FOR FUTURE OIL SPILL  
RESPONSE CAPABILITY**



OCTOBER 31, 1985

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With the assistance of Richard T. Tinney, Jr.

**Technical Report Number 5**



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## ACKNOWLEDGEMENTS

While the bow section of the PUERTO RICAN was still being towed through the Gulf of the Farallones and before the decision was made to return it to the San Francisco Bay, it occurred to us that there might well be important lessons to be learned from this unfortunate marine pollution incident. We approached the San Francisco Foundation regarding the possibility of funding a project which would evaluate the responses to this incident and make recommendations for improving oil spill contingency planning and cleanup in Central and Northern California. Jane Rogers of the foundation encouraged us to submit an application and has been consistently encouraging and supportive since the project was funded.

During the past year we have reviewed a four-foot high stack of documents obtained from a long list of agencies, laboratories and individuals. A long list of people have patiently listened to our requests and, in most cases, submitted the needed information. However, several individuals deserve special acknowledgement for the many hours spent locating data and discussing interpretations. Lt. J.D. Stieb of the Coast Guard Marine Safety Office (MSO), the principal documentarian for the MSO in this incident, and Cdr. Stewart McGee, the National Oceanic and Atmospheric Administration (NOAA) Scientific Support Co-ordinator were both of tremendous help.

In addition, Richard T. Tinney, Jr. of the Center for Environmental Education (Washington, D.C.) and Professor C.N.K. Mooers of the Naval Postgraduate School (Monterey, California) assisted us in technical evaluation of many of the documents.

Finally, Suzanne Donovan, who coordinated the production of the final report; Douglas Spicher, who helped us develop a computerized system for indexing the chronology; and Brian Baird of the California Coastal Commission, who reviewed a draft of the report from his perspective as one who has surveyed California spill response capability, also deserve our special thanks.

Despite all of this assistance, we take sole responsibility for the conclusions and recommendations contained in this report.

## EXECUTIVE SUMMARY

One year ago the tanker PUERTO RICAN exploded and burst into flames just beyond the Golden Gate and then drifted to within a few miles of the coast. Moderate weather conditions permitted fire-boats usually restricted to the Bay to respond and to bring the fire under control, although two of them suffered mechanical difficulties and were forced to return to the bay.

Three days later, while under tow in the waters of the Point Reyes-Farallon Islands National Marine Sanctuary (contrary to Coast Guard orders), the PUERTO RICAN broke in two and the stern section sank, spilling 25,000-35,000 barrels (1,050,000-1,470,000 gallons) of oil into the ocean, creating a major pollution incident. Oil dispersant application was delayed because a sampling vessel was unavailable; the principal industry boat had been rendered inoperative by high seas.

Although the spilled oil moved south during the first three days after the breakup, as predicted by the NOAA spill trajectory expert, and did not touch land, suddenly, on the third night, the oil reversed direction and moved north, first encircling the Farallon Islands and then coming ashore in Bodega Bay and Bodega Harbor. Weather conditions and damaged equipment greatly reduced oil skimming effectiveness at sea, and lack of barges limited transfer of oil from skimmers. Approximately 1,500 barrels (63,000 gallons) of emulsified oil were skimmed from the ocean and from Bodega Bay during the entire incident, representing less than 5% of the total released when the ship broke up. Estimates

of the total bird mortalities resulting from the incident have been placed as high as 5,000.

Eighteen days after the explosion, the bow section of the PUERTO RICAN was towed back into San Francisco Bay without incident and the cargo safely unloaded. Although the stern section has been located in 1,246 feet of water through the use of side-scan sonar, no action has been taken to stop the leak which has continued since the sinking. It was estimated that the stern contained 8,500 barrels (367,000 gallons) of bunker fuel when it sank, but the results of our investigation strongly suggest that an additional 11,725 barrels (492,000 gallons) of oil cargo may also have gone down with the ship.

In this report we focus on specific responses to the PUERTO RICAN incident as a test of Northern California's spill response capability. We identify a number of problems encountered in dealing with the explosion, fire, spill and sinking of the vessel. We then carefully examine these difficulties to determine why they occur and make a series of recommendations designed to eliminate the problems, thus improving responses to future pollution incidents.

1. Offshore fire fighting capability does not exist in the Bay Area, and only the moderate weather conditions at the time of the explosion and fire made it possible to use fireboats that normally are restricted to the Bay. In more severe weather, the fire likely would have continued until the entire ship sank.

This problem can only be solved with a vessel with offshore capability based in the Bay Area and available for fire fighting (and perhaps towing, spill cleanup and oil storage) in waters off of Central and Northern California.

2. Emergency offshore towing in this region is provided only by vessels of opportunity. The PUERTO RICAN nearly drifted ashore before a tug that simply happened to be in the area was able to tow it offshore.

A multipurpose, dedicated vessel designed for offshore towing should be based in the Bay Area and available for emergency response.

3. There was no plan regarding a location to which the PUERTO RICAN could be towed to minimize danger to the environment.

A plan should be developed to identify offshore areas to which damaged or distressed vessels can be towed in order to reduce risks of environmental damage.

4. Predictions of the oil spill movement failed to anticipate a severe current reversal. Lack of previous oceanographic research on offshore currents and real-time information on spill location at night reduced predictive effectiveness.

A research program is needed to develop a better understanding of circulation patterns in the Gulf of the Farallones and the rest of central and northern California. Telemetry drifter buoys should be utilized to track spill movement under poor visibility conditions.

5. Offshore cleanup capability was seriously limited by weather and equipment availability. Much valuable time was lost in bringing in equipment from out of the region. Difficulties were encountered with chartered equipment refusing to respond in bad weather or being too far from the site of the spill.

The oil industry should be required to base its own offshore cleanup vessel and barges in the Bay Area for quick response and should develop plans for the staging of booms and other materials in areas of high risk (e.g., harbor and river mouths, biologically sensitive areas, etc.).

6. The decision to apply oil dispersants was made in the absence of complete information regarding potential damage to the environment from oil or toxicity of the dispersed oil.

The state should develop a program to determine the acute and chronic toxicity of dispersants and dispersed oil, create a library of information on dispersant effectiveness and toxicity, and develop guidelines regulating conditions for dispersant application and monitoring.

7. The sunken stern continues to leak bunker fuel oil into waters of the marine sanctuary and nearly half a million gallons of additional oil product may also be in the stern.

The Coast Guard and/or the ship owner should be required to perform a survey of the stern, attempt to stop the leak(s) and make recommendations regarding the remaining oil product on board.

8. Information on resources (organisms and habitats) at risk

in the area was incomplete, resulting in faulty decision making regarding protection strategies.

A detailed catalog and maps of resources, their seasonality and sensitivity to oil should be developed for Northern and Central California, and computerized for ease of periodic revision (with the assistance of local resource experts).

9. The direction of the movements of the PUERTO RICAN by the On-Scene Coordinator (OSC) required the presence of a representative of the OSC at all times during the incident. At one of the most critical periods of the incident, the OSC representative was forced by weather conditions to leave the scene and this is when the tug violated the Coast Guard boundaries and the PUERTO RICAN sank.

In order to maintain total control of a pollution incident and vessels involved in it, the On-Scene Coordinator must have a representative present at all times. It should be possible to develop a system for delegation of several representatives, or to have a designated representative appoint a replacement if he must leave the scene.

10. The tug towing the PUERTO RICAN crossed boundaries establishing prohibited areas and spent almost half a day in violation of Coast Guard orders, north and east of bounded areas. There appear to have been no written copies of the orders establishing these boundaries.

Procedures should be established to require that explicit orders relating to Coast Guard intervention authority be in writing and that copies of such orders be delivered to vessel owners or their representatives and other interested parties.

The PUERTO RICAN explosion, fire, breakup and sinking were all components of a serious pollution incident. However, the small number of birds and mammals present in the Gulf of the Farallones during this time of year minimized the environmental damage. Had this incident occurred several months earlier, the potential damage to sea birds might well have been severe, with perhaps an order of magnitude more birds on S.E. Farallon Island; and if it had been a few months later, tens of thousands of whales, elephant seals and Steller sea lions would have been in the area. This, combined with the relatively light oil pro-

duct spilled that did not persist on beaches and rocky, intertidal areas, contributed greatly to a much milder incident than might have occurred with a more typical crude oil product.

Despite the fact that the PUERTO RICAN incident was not a "worst case" accident, the resulting damage and insurance claims may well exceed \$150 million.

The Coast Guard has already begun to revise its Oil Spill Contingency Plan, consistent with some of the recommendations made in this report, and legislation has recently been enacted by the state which will improve resource mapping and dispersant effectiveness research. We hope that the recommendations presented here will be used to further improve future responses to oil spills off the Central and Northern California coast.